Vol. 191, October 2007 (pp. 279-372)

**Psychiatry in pictures:**

**Psychiatry in pictures**
ALLAN BEVERIDGE

**Highlights of this issue:**

**Highlights of this issue**
KIMBERLIE DEAN

**EDITORIALS:**

‘Uppers’ keep going up
Hamid Ghodse

**Neurokinin-1 receptor antagonists as novel antidepressants: trials and tribulations**
SEPEHR HAFIZI, PRAKASH CHANDRA, and J. COWEN

**DEBATE:**

Research into putative biological mechanisms of mental disorders has been of no value to clinical psychiatry
DAVID KINGDON and ALLAN H. YOUNG

**REVIEW ARTICLES:**

**Mental capacity in psychiatric patients: Systematic review**
DAVID OKAI, GARETH OWEN, HUGH McGUIRE, SWARAN SINGH, RACHEL CHURCHILL, and MATTHEW HOTOPF

**Interventions for reducing the use of seclusion in psychiatric facilities: Review of the literature**
CADEYRN J. GASKIN, STEPHEN J. ELSOM, and BRENDA HAPPELL
PAPERS:

Ethnic variations in the experiences of mental health service users in England: Results of a national patient survey programme
VEENA S. RALEIGH, ROBERT IRONS, EMMA HAWE, SARAH SCOBIE, ADRIAN COOK, RACHEL REEVES, ANN PETRUCKEVITCH, and JULIETTE HARRISON

Incidence and predictors of mental ill-health in adults with intellectual disabilities: Prospective study
ELITA SMILEY, SALLY-ANN COOPER, JANET FINLAYSON, ALISON JACKSON, LINDA ALLAN, DIPALI MANTRY, CATHERINE McGregor, ALEX McCONNACHIE, and JILLIAN MORRISON

Social and cognitive functioning, urbanicity and risk for schizophrenia
MARK WEISER, JIM VAN OS, ABRAHAM REICHENBERG, JONATHAN RABINOWITZ, DANIELLA NAHON, EFRAT KRAVITZ, GAD LUBIN, MOTI SHMUSHKEVITZ, HAIM Y. KNOBLER, SHLOMO NOY, and MICHAEL DAVIDSON

Longitudinal grey-matter and glutamatergic losses in first-episode schizophrenia
JEAN THÉBERGE, KATE E. WILLIAMSON, NAOKO AYOAMA, DICK J. DROST, RAHUL MANCHANDA, ASHOK K. MALLA, SANDRA NORTHcott, RAVI S. MENON, RICHARD W. J. NEUFELD, NAGALINGAM RAJAKUMAR, WILLIAM PAVLOSKY, MARIA DENSMORE, BETSY SCHAEFER, and PETER C. WILLIAMSON

Recurrence of major depression in adolescence and early adulthood, and later mental health, educational and economic outcomes
DAVID M. FERGUSSON, JOSEPH M. BODEN, and L. JOHN HORWOOD

Aggressive behaviour, victimisation and crime among severely mentally ill patients requiring hospitalisation
SHEILAGH HODGINS, JANE ALDERTON, ADRIAN CREE, ANDREW ABOUD, and TIMOTHY MAK

SHORT REPORTS:

Chocolate craving when depressed: a personality marker
GORDON PARKER and JOANNA CRAWFORD

Screening young people for obsessive–compulsive disorder
RUDOLF UHER, ISOBEL HEYMAN, CATHERINE MORTIMORE, IAN FRAMPTON, and ROBERT GOODMAN
Extracting spurious messages from noise and risk of schizophrenia-spectrum disorders in a prodromal population
RALPH E. HOFFMAN, SCOTT W. WOODS, KEITH A. HAWKINS, BRIAN PITTMAN, MAURICIO TOHEN, ADRIAN PREDA, ALAN BREIER, JILL GLIST, JEAN ADDINGTON, DIANA O. PERKINS, and THOMAS H. McGLASHAN

Correspondence:

Psychopathy
M. J. Vitacco

Psychopathy
C. Neumann

Involuntary community treatment
M. Hotopf, G. Dunn, G. Owen, and R. Churchill

Authors’ reply:
J. Swanson and M. Swartz

Psychosocial interventions for self-harm
M. D. Rudd

Author’s reply:
M. J. Crawford, O. Thomas, N. Khan, and E. Kulinskaya

Psychiatric disorder and looked after status
M. K. Sekar

Authors’ reply
T. Ford, P. Vostanis, H. Meltzer, and R. Goodman

Lithium for prevention of Alzheimer’s disease
T. Terao

Authors’ reply:
W. F. Gattaz, O. V. Forlenza, and P. V. Nunes
Mortality and electroconvulsive therapy
Y. Le Strat and P. Gorwood

Mortality and electroconvulsive therapy
R. Bharadwaj and S. Grover

Authors’ reply:
T. Munk-Olsen, T. M. Laursen, P. B. Mortensen, P. Videbech, and R. Rosenberg

Measuring stigma
R. Haghighat

Authors’ reply
M. B. King, S. Dinos, M. Serfaty, S. Weich, and S. Stevens

Metabolic syndrome and intellectual disability
P. Sivakumar

One hundred years ago:

On the Etiology of Mongolian Idiocy [Mongolidiotiens Ætiology]. (Nyt Tidsskrift für Abnormvæsenet, 9 Hefte, 1906.) Bodil Hjorth
Henry Rollin

Corrigenda:

Correction for Volume 191, p. 268

Book reviews:

The Overlap of Affective and Schizophrenic Spectra
Nick Craddock

Speed, Ecstasy and Ritalin: The Science of Amphetamines
Sanju George

The Psychiatric Interview in Clinical Practice (2nd edn)
Simon Michaelson
Evolving Psychosis: Different Stages, Different Treatments
Rachel Upthegrove

Critical Voices in Child and Adolescent Mental Health
Fiona Subotsky

Psychoeducation Manual for Bipolar Disorder
Dominic Lam

The Science of Orgasm
Nick Dunn

From the Editor's desk:

PETER TYRER
Highlights of this issue

BY KIMBERLIE DEAN

CLINICAL PRACTICE AND CLINICAL SERVICES IN THE SPOTLIGHT

Kingdon & Young (pp. 285–290) debate the impact of biological research on clinical psychiatry in the Journal this month. This is followed by a number of review and original research articles which have focused on clinical practice and mental health services. With a particular emphasis on ethnic variation, Raleigh et al (pp. 304–312) examined data from two national surveys of service users’ access to and experience of community mental health services. In addition to finding that ethnicity is poorly recorded by services, the authors found that a number of socio-demographic and clinical factors had a stronger independent impact on patient experience than did ethnicity. Compared with the White British group, the Asian but not the Black patient group responded negatively when asked about their experience of services.

Okai et al (pp. 291–297) conducted a systematic review of research related to mental capacity to consent to treatment among psychiatric patients. Despite the heterogeneity of studies included, the authors found consistent evidence that capacity can be reliably assessed, that mental incapacity is common, and that clinical rather than socio-demographic factors have the greatest impact on likelihood of incapacity. In another review, Gaskin et al (pp. 298–303) found evidence to support interventions intended to reduce use of seclusion facilities in psychiatric units. The authors warn against ignoring the findings of pragmatic studies and argue that more reports of failed attempts to reduce seclusion are needed.

In an inner-city in-patient sample of individuals with severe mental illness, Hodgins et al (pp. 343–350) found high rates of aggressive behaviour, violent victimisation and criminality. They argue that service providers need to recognise that general adult wards are now treating a subgroup of patients presenting with complex difficulties and that this necessitates consideration of specific treatment packages designed to improve outcomes for such groups.

SOCIAL AND BIOLOGICAL STUDIES OF SCHIZOPHRENIA

The mechanisms underlying the well-established association between urbanicity and increased risk of schizophrenia are not well understood. Weiser et al (pp. 320–324) found evidence for an interaction between population density and poor premorbid social and cognitive functioning, in relation to later risk of schizophrenia. Theberge et al (pp. 325–334) examined glutamatergic changes in a sample of individuals with schizophrenia during their first episode of illness in relation to grey matter volumetric reductions. Thalamic and anterior cingulate glutamine levels were noted to be higher than normal. The authors also noted a correlation between parietal and temporal grey matter loss and thalamic glutamine loss.

ADOLESCENTS, YOUNG ADULTS AND THOSE WITH INTELLECTUAL DISABILITY

On the basis of data from a birth cohort based in Christchurch, New Zealand, Fergusson et al (pp. 335–342) found that over one third of the sample met criteria for major depression on at least one occasion between ages 16 and 21 years, with 22.7% reporting two or more episodes. They also found that frequency of depression in adolescence and early adulthood predicted poorer psychiatric and life-course outcomes. In a prospective study of a sample with mild-to-profound intellectual disability, Smiley et al (pp. 313–319) found a 2-year incidence of 16.3% for mental ill health. The authors identified a number of risk factors for future ill health, some of which appeared to differ from those found in the general population (e.g. type of accommodation and support, urinary incontinence, severity of intellectual disability and not having impaired mobility).
Skating on Duddingston Loch by Charles Altamont Doyle (1832–1893)

Charles Altamont Doyle, the father of Arthur Conan Doyle, was a Victorian painter and illustrator. He spent his last years in Scottish asylums where he continued to paint and sketch. In the biographies of his famous son, Charles is usually portrayed as a gentle unworldly man whose fondness for the bottle led to him being shut away in a mental institution. However, recent research (Beveridge, 2006) suggests that Doyle suffered from memory impairment as a result of heavy drinking. This, combined with his generally unmanageable and violent behaviour when drunk, led to his eventual admission to a home for inebriates and then to an asylum. Charles Doyle was born in London in 1832 into an Irish Catholic family. His father John Doyle was a prominent political cartoonist and his brother Dicky became a celebrated illustrator for Punch and a noted exponent of the Victorian fairy genre. In 1849 Charles was sent by his family to Edinburgh where he met Mary Foley, whom he later married in 1855. They had nine children, the third child being Arthur, who was born in 1859. Charles was employed by the Scottish Office of Works and, in his spare time, he pursued his art. The above picture, which is a scene from Edinburgh life, was painted before Charles became institutionalised. The two subsequent issues of the Journal will feature work he completed while an inmate of Montrose Asylum.


Picture by permission of National Museums of Scotland.
‘Uppers’ keep going up

HAMID GHODSE

Summary Amphetamine-type stimulants are the second most widely used drugs in the world. Overprescription results in diversion for recreational use and the development of dependence. The internet plays a significant role in global misuse of amphetamine-type stimulants, permitting uncontrolled dispensing by online pharmacies and providing information on techniques for illicit manufacture.

Declaration of interest H.G. is a member (past President) of the United Nations International Narcotics Control Board in Vienna.

Amid increasing concern about the misuse of methamphetamine, it is important to remember that misuse of amphetamine-type stimulants is not a new phenomenon (Ghodse & Kreek, 1998). Indeed, there is a long history of dependency and misuse of this class of drugs, with widespread consumption by armies and the industrial workforce during the Second World War. During the 1960s and 1970s amphetamines were increasingly prescribed as antidepressants and anorectics and misuse became common, particularly in the USA where demand was so great that several billion amphetamine tablets were manufactured every year (Addiction Research Foundation, 1987).

Many people who had initially received amphetamines on prescription became dependent and refused to discontinue their use (Ghodse, 2002a). Others started consuming them specifically for their stimulant properties. For example, they were utilised by students and by long-distance lorry drivers to promote wakefulness, and were also used for recreational purposes.

Initially the major source of amphetamines was the legitimate pharmaceutical industry, with overprescribing leading to diversion of surplus tablets to the illicit market. In addition, there was criminal procurement by theft and falsification of prescriptions. The scale of misuse was such that in the 1960s, the US Food and Drug Administration estimated that half of the amphetamines manufactured found their way into illicit channels of distribution (Sadusk, 1968).

The twin problems of overprescribing and misuse became so serious that national and international control measures became inevitable (Ghodse, 2002a,b; Karen & Laidler, 2002). In the UK, for example, there was a voluntary ban on prescribing amphetamines by medical practitioners. The inclusion of amphetamines in the 1971 International Convention on Psychotropic Drugs resulted in a reduced flow of legally manufactured amphetamines to the illicit market. During the 1980s the legal manufacture of amphetamine and dexamphetamine was stable at around 50 kg and 350 kg annually respectively. However, demand for amphetamines for drug misuse remained high and was increasingly met by illicitly manufactured amphetamines rather than by overspill of prescribed drugs.

After this period of relatively low medical use it increased again, and by 2004 some 25 million people worldwide used amphetamines, with more than 60% living in Asia. In 2005, approximately 12.9 tons of amphetamine (60 million defined daily doses) were manufactured legally in the USA for direct medical use, 76 times more than in 1991 (United Nations, 2006). The annual prevalence of amphetamine use is highest in Oceania, followed by North America, and East and South-East Asia. There are an estimated 2.7 million users in Europe, with the UK continuing to be the largest market (United Nations Office on Drugs and Crime, 2006).

STIMULANTS USED AS ANORECTICS

In a society which is increasingly preoccupied with weight and obesity, the introduction of controls on amphetamine prescription led to the search for and production of other anorectic drugs (e.g. fenfluramine, phentermine, fenproporex and mazindol). Following the publication in 1992 of the results of a weight control study utilising fenfluramine and phentermine for long-term treatment (Weintraub, 1992), there was a resurgence in the use of anorectic drugs, leading to a peak of consumption in the US in 1996 when nearly 20 defined daily doses were consumed per 1000 inhabitants per day. This was followed by the familiar pattern of wide availability and misuse, with an illicit market driven by diversion from licit channels.

The withdrawal of fenfluramine from the market in the USA and the associated reduction in consumption of phentermine, which was often prescribed in tandem, heralded a downward trend in the use of amphetamine-type stimulants and by 2005 consumption was one-fifth of the level 10 years earlier. Other countries have experienced similar trends over a somewhat later period.

METHYLPHENIDATE

A new trend in the misuse of amphetamine-type stimulants developed during the early 1990s with global manufacture of methylphenidate increasing tenfold from 2.8 tons in 1990 to 28.8 tons in 2005 (United Nations, 2006). This was a result of its increased use in the treatment of attention-deficit hyperactivity disorder (ADHD) (Mayer, 1996; Ghodse, 1999). Initially, this occurred in the USA, which is still the main consumer of these substances, but the same phenomenon has been observed in other countries, including Australia, Canada, New Zealand, Switzerland and the UK. Serious concerns have been raised about the possible overdiagnosing of ADHD and consequent overprescribing of methylphenidate to children (International Narcotics Control Board, 1999).

Such a high rate of prescribing leads to a range of associated problems, including theft of methylphenidate from unregistered locations, such as schools and homes where large quantities of methylphenidate may be available, free from the accountability requirements placed on licensed handlers. Not surprisingly, there is evidence of diversion of methylphenidate for illicit use and reports of its misuse by adolescents and young adults orally or by crushing and
snorting. It is taken for its stimulant effects, appetite suppression, increased focus/attention, and euphoria in a way that echoes the use of amphetamine on campuses in the 1960s (Woodworth, 2000).

**METHAMPHETAMINE**

More recently, there is evidence of increased misuse of illicit methamphetamine in many parts of the world, although this remains patchy. Historically, most methamphetamine misuse has been reported from the USA, where it is now perceived as the most serious drug misuse problem. Worryingly, it is spreading throughout the USA, albeit unevenly but especially in rural and semi-rural areas. Evidence of this comes from admission rates for methamphetamine misuse which have reached 323.6 per 100,000 population aged 12 years or over (Lineberry & Bostwick, 2006). In South-East Asia, Japan, the Philippines, Republic of Korea and Thailand, methamphetamine is also the drug of choice, and in some European countries (e.g., Czech Republic, Baltic States), methamphetamine misuse now exceeds misuse of amphetamine. Manufacture and trafficking have also been reported from South Africa, providing further evidence of the spread beyond the 'traditional' areas of production in North America and Asia. This is particularly worrying because methamphetamine misuse is associated with serious adverse effects and is very difficult to treat because of protracted craving.

In the USA, strict regulation of precursors, such as ephedrine and pseudoephedrine, used in the illicit manufacture of methamphetamine led to a reduction in domestic production, but this was more than counterbalanced by smuggling from clandestine laboratories in Mexico. Similarly, in Australasia, rising methamphetamine misuse is fuelled by clandestine manufacture, predominantly in South-East Asia. There is now growing concern that illicit manufacturers are bypassing international controls on ephedrine and pseudoephedrine. They are purchasing large quantities of proprietary flu and cold remedies, which contain these substances, and which, as medicinal preparations, are not subject to international control (Ghodse, 2002b; Karen & Laidler, 2002).

**THE INTERNET**

More recently, the internet has become an important component of the illicit market, with online pharmacies advertising and selling controlled substances without prescription through regular mail channels. The scale of this activity is huge and the US Customs Service reportedly seized nearly 10,000 packages containing prescription drugs during 1999, about 4.5 times as many as in 1998 but undoubtedly representing only a small fraction of prescription drugs entering the USA via this route.

In addition, websites provide practical advice on how to obtain prescription drugs from different countries, listing pharmacies and physicians which offer medications without prescription and ship them directly to the customer. In 2005, US law enforcement officers arrested 18 illegal internet pharmacy owners and suspended the registration of 20 doctors and 22 pharmacies. It was found that those arrested operated 4600 illegal internet pharmacy sites, handling 15,000 customers each week and that 3000 orders for controlled substances were dispensed each day (Tandy, 2005).

Finally, with modern computer technology and chemists' increasing willingness to share their knowledge, information on the manufacture of illicit drugs (i.e., drug recipes) is now available to anyone with computer access. Indeed, it is estimated that less than 10% of suspects arrested for illicitly manufacturing methamphetamine are trained chemists.

**PREVENTIVE MEASURES**

Given the acknowledged harm associated with the misuse of amphetamine-type stimulants and the difficulty of treating dependence, the importance of preventive measures is obvious. Most involve the application of principles that are relevant to all types of substance misuse.

In view of the historical link between overprescription and misuse, the medical profession bears an important responsibility to prescribe appropriately and to undertake initiatives to promote good practice. Psychiatrists, in particular, should play a role in educating healthcare professionals as well as the wider public to achieve a culture of rational prescribing of these and other psychotropic drugs.

However, the diversion and smuggling of amphetamine-type stimulants will only be counteracted by intensified cooperation between law enforcement and drug regulatory authorities, including the establishment of mechanisms for the prompt exchange of information among national authorities, and particularly between the countries into which these products are smuggled and the suspected source countries. Proposed approaches include the prevention of diversion from domestic distribution by strict implementation of the prescription requirement; control of international trade; and the prevention of irresponsible marketing and prescribing. Compliance with the United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988, which controls nine substances (precursors) used in the illicit manufacture of amphetamine-type stimulants, is also essential.

Worldwide, there are now more than a billion internet users and legislation and resources for law enforcement in this area are currently inadequate. In relation to substance misuse it is essential that governments ensure that appropriate laws are introduced to deal with crimes committed in an electronic environment. These should be harmonised internationally to ensure that offences, sanctions and standards of proof are similar to prevent the growth of data havens. Law enforcement agencies responsible for fighting drug-related crime must be provided with the technical and legislative means to develop an appropriate response capacity for internet crime, and measures must be introduced to license and oversee online pharmacies that operate or deliver prescription drugs. Specifically, the online sale of narcotic drugs and psychotropic substances, including amphetamine-type stimulants, should be prohibited altogether, since it circumvents the existing national and international control system.

**CONCLUSIONS**

The history of amphetamine-type stimulants over the past 70 years demonstrates a remarkably cyclical and repetitive pattern, with a series of new drugs being introduced for therapeutic purposes. Now, with approximately 35 million users, they have become the second most widely used drugs in the world. Enthusiastic overprescription has contributed to recreational misuse for their stimulant properties, the development of dependence and diversion to the illicit market. Typically, the introduction of a new therapeutic agent has been accompanied by claims of an absence of liability for misuse/dependence, but initial optimism
Drug Abuse


Acknowledgement

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References


Neurokinin-1 receptor antagonists as novel antidepressants: trials and tribulations

SEPEHR HAFIZI, PRAKASH CHANDRA and PHILIP J. COWEN

Summary Based upon animal experiments and early clinical trials, neurokinin-1 receptor antagonists showed promise as novel antidepressants. Subsequently, however, more extensive clinical trials did not reveal evidence of efficency in depression. The development of novel antidepressants will require a better understanding of the neural basis of antidepressant action in humans.

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For the past 50 years the pharmacological treatment of depression has rested on the use of drugs that potentiate the activity of monoamines, particularly serotonin (5-hydroxytryptamine; 5-HT) and noradrenaline. Both the tolerability and efficacy of current treatment is limited and there has been much effort to develop antidepressant agents with different modes of action and improved therapeutic profile. The difficulties confronting those engaged in this task are well illustrated by the clinical development of neurokinin-1 (NK1) receptor antagonists.

SUBSTANCE P AND NK1 RECEPTORS

Substance P is a neuropeptide that acts as a neurotransmitter or neuromodulator within both the central and peripheral nervous systems by preferentially binding to the NK1 receptor. In many brain regions it acts as a co-transmitter with ‘classical’ monoamine neurotransmitters such as 5-HT and noradrenaline. A number of findings from animal studies are consistent with the notion that substance P and NK1 receptors might be implicated in the pathophysiology of depression (Kramer et al, 1998). First, NK1 receptors are found in brain regions that are implicated in the regulation and expression of emotion, including the hippocampus, amygdala, prefrontal cortex and ventral striatum. Second, a variety of emotionally unpleasant stimuli, including foot-shock, pain, immobilisation and maternal separation increase substance P concentrations in limbic regions. Third, central administration of substance P produces behavioural and cardiovascular responses that resemble those seen following stressful stimuli. Fourth, there is significant overlap between 5-HT and noradrenaline pathways and substance P in limbic brain areas, and repeated administration of traditional antidepressants leads to decreased synthesis of substance P in certain brain regions. Fifth, mice in whom the NK1 receptor has been knocked out are less anxious; for example, these mice exhibit greater exploration in the open field test. In addition, NK1 receptor knockout mice are more active in the forced swim test, an effect similar to that produced by antidepressant treatment in wild-type mice (Santarelli et al., 2002).

There is little direct evidence in humans implicating substance P in depression, but substance P levels may be increased in cerebrospinal fluid in people with depression who are not on medication (Geraci et al, 2006). A post-mortem study of 12 depression patients, 6 of whom had died by suicide, found lowered NK1 receptor numbers in the orbitofrontal cortex compared with controls (Stockmeier et al., 2002). This could be consistent with increased release of substance P.

PRECLINICAL STUDIES OF NK1 RECEPTOR ANTAGONISTS

Non-peptide antagonists for the NK1 receptor were discovered about 15 years ago and several highly specific ligands have been developed since. As expected, these drugs block the behavioural effects of centrally administered substance P as well as certain stress-related behaviours in which substance P has been implicated, for example, vocalisations by guinea pig pups separated from their mothers (Kramer et al, 1998).

NK1 receptor antagonists are active in several animal models designed to detect anxiolytic and antidepressant effects. Some animal models of anxiety are based on unconditioned fear responses; these include the elevated plus maze or open field test, which measure aversion of rodents to novel, brightly lit environments. Similar models examine anxiety produced by social interaction with unfamiliar conspecifics or maternal separation. Other tests use conditioned anxiety responses where a stimulus (for example, a light) becomes aversive through being paired with a mild electric foot-shock. Conditioned anxiety models detect the effects of standard anxiolytics such as benzodiazepines. NK1 receptor antagonists have been shown to have anxiolytic properties in the rodent elevated plus maze, rat social interaction test and fear-conditioning paradigms (see Ebner & Singewald, 2006).

Animal models are also used to detect potential antidepressant drugs. Some of these tests (for example, tail suspension of mice or the forced swim test in mice and rats) are used as assays which have proved sensitive to clinically established antidepressant drugs. Others, employing chronic environmental stressors, attempt to provide models of depression that have some face validity for the human disorder and which should therefore be sensitive to both established and novel antidepressant agents. For example, the chronic mild stress model in rats uses a variety of modestly unpleasant environmental manipulations, including changes of temperature and periods of food and water deprivation, to produce a decrease in the consumption of sucrose solution; this symptom is taken as an analogue of anhedonia and is reversed by chronic treatment with antidepressant drugs. Social stress and setbacks are known to be associated with depression in humans; therefore other animal models use stressful social manipulations to produce behavioural deficits (for example, decreased scent marking by tree shrews) that are sensitive to antidepressant administration. NK1 receptor antagonists have antidepressant properties in the chronic mild stress and
social stress model as well as the forced swim and tail suspension tests (Ebner & Singewald, 2006).

**CLINICAL STUDIES OF NK₁ RECEPTOR ANTAGONISTS IN DEPRESSION**

Kramer et al (1998) studied the effect of an NK₁ receptor antagonist, MK-869 (aprepi-tant), in a 6-week trial in about 200 people with major depression. Participants were randomly allocated under masked conditions to one of three treatments: aprepi-tant 300 mg daily, paroxetine 20 mg daily and placebo. Both aprepi-tant and paroxeetine were significantly superior to placebo in lowering scores on the Hamilton Rating Scale for Depression (HRSD) and the Hamilton Rating Scale for Anxiety. Both active treatments were of equal efficacy but aprepi-tant was better tolerated than paroxetine, with increased levels of somnolence the only side-effect compared with placebo. In a further double-blind study of about 130 out-patients with melancholic depression, Kramer et al (2004) found that another NK₁ receptor antagonist (L-759274) also produced a significantly greater improvement in HRSD scores than placebo.

However, these compelling early findings were not supported by subsequent investigations. Keller et al (2006) reported results from five randomised, double-blind, controlled studies in over 2500 people with depression. They found that 8 weeks of treatment with aprepi-tant at doses of 80 mg and 160 mg showed no benefit over placebo. In contrast, paroxetine 20 mg daily, which was used as an active comparator in three of the five studies, was significantly better than placebo in each one. Positron emission tomography carried out at the same time indicated that both doses of aprepi-tant used in the trials would have produced high levels of central NK₁ receptor blockade with occupancy with the 160 mg dose regime being over 95% (Keller et al, 2006). Given together with dexamethasone and a 5-HT₁ receptor antagonist, aprepi-tant is licensed at daily doses of 80–125 mg for the prevention of chemotherapy-induced nausea and vomiting; this suggests that the doses employed in the clinical trials of people with depression would have been pharmacologically active.

**CONCLUSIONS**

More effective and better tolerated antidepressant medications are badly needed for the management of major depression; however, the development of the NK₁ receptor antagonists as antidepressants shows how formidable this task is. The NK₁ receptor antagonist aprepi-tant survived many hurdles at which candidate antidepressant drugs may fail. Aprepi-tant appears safe and well tolerated and has suitable oral pharmacokinetics for the treatment of depression. Two early clinical trials suggested efficacy.

A somewhat later, but major problem in the development of antidepressant drugs is the high frequency of failed trials in major depression; that is studies where both an active comparator as well as the compounds under investigation fail to show therapeutic benefits over placebo. However, this was not the case in the studies summarised by Keller et al (2006) in which the comparator drug paroxetine was indeed more effective than placebo. However, the problem seems to have been rather that the underlying concept of NK₁ receptor antagonism as an antidepressant mechanism may have been mistaken.

A major underlying problem in the development of new antidepressant drugs is the reliance on animal models to provide proof of concept because we lack valid animal models of depression. However, even with conditions such as head injury or neonatal respiratory distress syndrome, which can be more closely modelled in animal studies, clear concordance between beneficial effects of treatment in animals and patients is often lacking (Perel et al, 2007). We suggest that there is a need to develop new human models in which effects of potential antidepressants can be detected. This work requires a much better understanding of the interaction of antidepressant drugs with the neural circuitry involved in emotional regulation, work which modern methods of brain imaging is beginning to make possible (see Norbury et al, 2007). In addition, with appropriate ethical safeguards it should be possible to carry out proof of concept studies of potential antidepressant agents in the most relevant participant groups; that is patients with depression or those at high risk (Bhagwagar et al, 2004).

The possible role of NK₁ receptor antagonists in the treatment of emotional disorders is still an area of active enquiry. The early clinical studies suggest that some people with depression may benefit, but identification of potential responders on clinical grounds alone seems unlikely to be successful. NK₁ receptors have pharmacological interactions with 5-HT pathways, hence it is conceivable that NK₁ receptor antagonists might augment the therapeutic effects of selective serotonin reuptake inhibitors in depressive and anxiety disorders (Ebner & Singewald, 2006). Finally it is probably easier to model anxiety than depression in animals, albeit normal anxiety responses to stressors rather than true pathological states. As noted above there is much evidence from animal studies that NK₁ receptor antagonists could have anxiolytic effects and there are now clinical data suggesting potential efficacy of another NK₁ receptor antagonist, GR205171, in patients with social phobia (Furmark et al, 2005). A number of other NK₁ receptor antagonists are still being investigated for their psychotrophic potential.

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Research into putative biological mechanisms of mental disorders has been of no value to clinical psychiatry

DAVID KINGDON/ALLAN H. YOUNG

FOR

In 1845 Griesinger declared that mental disorders were physical in origin (Kendell, 2001). The discovery of the bacterial cause of general paresis and the anatomical basis for Alzheimer’s disease seemed to confirm this belief. However, is it still reasonable, a century later, to continue to devote increasing amounts of financial and expert human resource to pursuing further possible physical causes for mental disorders? The belief that there remain undiscovered and important biological causes for mental disorders continues to exert a major influence on the direction of research, practice and public education. But has it helped us to understand aetiology, improve management or destigmatise mental disorders?

Aetiology

Certainly there have been a multitude of biological findings reported in eminent psychiatric journals since they were founded, but conclusions about their significance continue to be conflicting and most evidence is non-specific, at least for the individual patient. Whether or which of these findings represent causative or epiphenomena remains in doubt or dispute even to the many resolute believers in the biological origins of mental disorder.

Genetic research, for example, has promised much. The search for the genes for individual mental disorders commenced and gained pace through the last century, but has failed to identify specific genes for schizophrenia, bipolar or other psychiatric disorders. This has now been substituted by the search for ‘susceptibility genes of variable effect’, although what clinical benefit could result from such a search for multiple interacting genes is unclear. At least where single genes were contemplated, discovering genes coding for single aberrant proteins might have had pharmacological implications.

There is, of course, strong support for a genetic basis for personality. There are also demonstrable links between mental disorders and personality, and thus for a vulnerability for mental disorder. Is the genetic vulnerability to mental disorder anything more than this? Research into the interaction between specific stressors, for example trauma (Read et al, 2003), hallucinogenic drugs (Hall, 2006) and sensitivity to stress (Myin-Germeys et al, 2005), and personality vulnerability has been more clinically productive. It is understandable to patients and the general public, fitting with their models of mental disorder, supports the development of psychosocial interventions and could provide a more comprehensible categorisation of psychiatric conditions (Kingdon et al, 2007).

Diagnosis

Has research into biological mechanisms assisted us in diagnosis? Urinary chromato­graphy, the dexamethasone suppression test and neuroimaging have promised much but have produced nothing of value for individual patients. Changes found by neuroimaging have various explanations. For example, is hypofrontality in schizophrenia the cause or effect of reduced activity for social, psychological or biological reasons? Changes in brain functioning can occur with psychological treatments. Brain shrinkage is very non-specific diagnostically and given that neuroplasticity is well recognised (e.g. in relation to trauma) is of uncertain importance.

Treatment

So what about the contribution to treatment? Pharmacological discoveries have occurred as a result of observations by astute and observant clinicians, for example Laborit for chlorpromazine (Lopez-Munoz et al, 2005) and Kane for clozapine (Kane et al, 1988). The mechanisms of action of these drugs, not the mechanisms of the underlying disorders, were then used for biochemical refinement. A review of guidelines from the National Institute for Health and Clinical Excellence (http://www.nice.org.uk) exposes the absence of influence of research into biological mechanisms. This contrasts with research into psychosocial mechanisms, which has been much more productive.

Destigmatisation

So has research into biological mechanisms assisted the cause of destigmatisation? It has certainly been very influential in relation to psychiatrists’ attitudes, with almost half in the UK believing that, for example, schizophrenia has primarily biological rather than a combination of social and biological causes (Kingdon et al, 2004). However, the general public seems less convinced, and programmes based on adages such as ‘Schizophrenia is a brain disease’ have had no demonstrable effect on stigma and may have worsened it (Angermeyer et al, 2005). Similarly, psychoeducational programmes have been associated with increased suicidality (Cunningham-Owens et al, 2001) and acceptance of illness paradigms with increasing depression ( Rathod et al, 2005). Presenting schizophrenia as primarily a disease caused by biological deficit – but we don’t know what the deficit is – is unsurprisingly not a credible position to hold. It only confuses patients and carers, who have often recognised vulnerabilities and stresses relevant to the onset of the individual’s problems. Such a biological approach to mental disorder has not even had a beneficial effect on recruitment into psychiatry, being quite unconvincing to medical students despite the interest in the mind as evidenced by the popularity of psychology degrees and clinical psychology.

Indeed whether the term mental disorder is meaningful or helpful in itself is doubtful. Disease classifications may work elsewhere but not with the circumstances psychiatrists face: anxiety and depression are not disorders in most instances but adaptations to stress. Even symptoms of psychosis, such as hearing voices and thought transference, can occur in a range of stressful (e.g. deprivation) states and other circumstances (e.g. trances and spiritual experience). Far more appropriate would be to develop classifications of mental and behavioural responses. Such classifications, which are not value based, are usual in the natural or social sciences (e.g. with fauna or flora or with social groupings).
Individuals then can select psychiatric, psychological and social interventions if they choose (or rarely, do so at society’s behest). Rather than ‘mental disorder’ being ‘what psychiatrists treat’ as Kendell (1975) stated, a system that explicitly acknowledges individual variation, choice and need, and the role of the psychiatrist as one among others, including the criminal justice, housing and benefits system, can address or accommodate mental and behavioural responses more appropriately. By using inappropriate disease analogies, we have been hoisted by our own petard, contributing to continuing stigmatisation and the misunderstandings that, for example, underpin the current government’s attempts to make psychiatrists responsible for all mental, including personality, disorders.

Conclusions

Research into biological mechanisms of mental and behavioural responses has failed to deliver anything of value to clinical psychiatrists and is very unlikely to do so in the future. Psychiatry will become credible psychiatrists and is very unlikely to do so in psychiatrists. An example of this is drugs used to approach both. If we forget the biochemical only arrived many decades ago. Until very recently this was assumed to be a ‘psychiatric’ illness. It has only been since the acceleration of research in the past decade or so that this has been re-evaluated. The involvement of neurologists, gerontologists, neuroscientists and others in research into the biological mechanisms of Alzheimer’s disease has given a great boost to this research. Clearly Professor Kingdon would not argue that research into the pathophysiological bases of Alzheimer’s disease has been of no value, and even if he did few would agree with him.

Similar misconceptions are commonly held about genes. The old edition of *Companion to Psychiatric Studies* (Kendell & Zeally, 1988), which sits on my shelf and which I still refer to, states very clearly that the common psychiatric conditions are most likely to be due to multiple genes of small effect. These are now being discovered and will lead to benefits to clinical psychiatry eventually. Notwithstanding, the problems of discovering the genetic contribution to an illness such as depression are similar to those posed by other common medical conditions such as hypertension and diabetes. A similar toolkit should be used to approach both. If we forget the commonality between mental ill health and other common illness we will impoverish our vision as to what might be discovered to benefit our patients.

Diagnosis

History-taking and clinical examination remain the foundation of our practice in psychiatry – as they do in the rest of medicine. Diagnostic tests are of supplementary value in psychiatry, albeit to a lesser extent than in many other areas of medicine. This should not be viewed as a ‘weakness’ of psychiatry but rather as a particular characteristic; indeed many would argue that if history-taking is the basis of medicine psychiatrists are the best physicians. The diagnostic use of the dexamethasone suppression test is of course outmoded; however, the evolution of this into the dexamethasone/corticotrophin-releasing hormone test (Watson et al, 2006) is on the threshold of allowing us to specifically target some physical treatments (Kunugi et al, 2006).

Treatment

Many have been scathing about the paucity of truly new drug treatments in psychiatry and the role of the pharmaceutical industry in general. We must acknowledge the lag between primary research into disease mechanisms and the realisation of clinical benefits, as illustrated by the case of Alzheimer’s disease. Drug treatments for this devastating illness only arrived many decades after the initial description of plaques and tangles. New drug treatment approaches are being pioneered in psychiatry, both by the pharmaceutical industry and by academic psychiatrists. An example of this is drugs which act on the hypothalamic–pituitary–adrenal (HPA) axis for mood disorders – these come after a long chain of diverse research which I shall briefly describe here.

**HPA axis: model for an integrated approach**

The HPA axis is of course a physiological system which is sensitive to psychological stress and is subject to modulation by factors such as social hierarchy. The function of the HPA axis in adulthood is very heavily influenced by adverse circumstances in early life and these early stressors alter gene function (Meaney & Szyf, 2005). Moreover, the HPA axis is abnormal in severe mood disorders and may be sensitive to drugs and psychotherapy (Watson et al, 2004). Thus ‘biological’ research of the

David Kingdon

AGASt

Professor David Kingdon is to be congratulated for proposing the motion with some enthusiasm. I will refute his contention by specifically addressing the points which he has raised. In addition, I will refer to flawed assumptions that form the bedrock of his case and the erroneous attitudes consequent to these. Finally I will suggest a reframing of the argument that will allow us to move our position to a more helpful and productive point of view. I shall also include an example of a broadly based approach which integrates various scientific disciplines and techniques, and is of current value to clinical psychiatry.

AetiologY

The term ‘biological’ is often misunderstood in psychiatry, sadly not only by the uninitiated trainee. The arguments have been well rehearsed before and the interested reader is referred to Dr Guze’s magisterial article (Guze, 1989). In brief, the error in thinking is that there are multiple different ‘psychiatries’. One of these is ‘biological’, one ‘psychosocial’ and so on. Biological, in particular, is misused as being synonymous with either a neurological or physico-chemical psychiatry. The correct position is of course that biology is the study of life and psychiatry is a biological, more specifically a biomedical, discipline. This must be emphasised as it is a key rationale dictating the approach to research and care of mental ill health.

Biology of course does not just mean drugs or genes: Freud was aware of this and considered himself a biologist. Moreover, psychotherapeutic treatments are a key part of the approach to helping our patients. Indeed Professor Kingdon’s own very distinguished work on psychotherapeutic approaches to schizophrenia occurs within a biological context (in the true meaning of the word) and has been of great benefit to clinical psychiatry. Another example is Alzheimer’s disease. Alzheimer (working in a department of psychiatry) described the neuropathology of the illness which now bears his name approximately a century ago. Until very recently this was assumed to be a ‘psychiatric’ illness. It has only been since the acceleration of research in the past decade or so that this has been re-evaluated. The involvement of neurologists, gerontologists, neuroscientists and others in research into the biological mechanisms of Alzheimer’s disease has given a great boost to this research. Clearly Professor Kingdon would not argue that research into the pathophysiological bases of Alzheimer’s disease has been of no value, and even if he did few would agree with him.

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HPA axis utilises a wide variety of scientific approaches.

What about treatment? Excess levels of corticosteroid hormones (the end product of the HPA axis) impair the neurochemical actions of antidepressants and are associated with non-response in clinical populations (Gartside et al., 2003). Drugs which counteract the effects of corticosteroids show promise as treatments in mood disorders (Young et al., 2004). Research on the HPA axis thus illustrates the diversity of research approaches which need to be employed to tackle the tough problems of psychiatry; all of these however are ‘biological’.

Destigmatisation

Stigma is one of the largest problems confronting mental health professionals. However, the notion that we could solve stigma by transforming mental ill health into something it is not is clearly wrong. Prejudice and injustice against those who suffer mental ill health should be addressed in the same way as other such unacceptable beliefs; the underlying assumptions need to be brought out into the open and the behaviours arising from these beliefs challenged. Stigma directed against mental ill health is as nasty and as morally wrong as racism, homophobia and all the other related prejudices. We as a profession need to challenge stigma on a priori grounds.

Kingdon quotes the late Professor Robert Kendell when he challenges the very conceptual basis of our existence as a medical specialty. I would suggest that all psychiatrists read Kendell’s The Role of Diagnosis in Psychiatry, which it remains as relevant now as when it was first published. Kendell exhaustively reviews all the alternatives to our diagnostic system and concludes that none can currently replace it in clinical psychiatry. I agree with Professor Kingdon that many psychiatric disorders are stress related (after all I spend my life working on the HPA axis!), but many other diseases in medicine are also stress related and such an observation does not argue against our current model of clinical practice.

Reframing the argument

The notion that research into biological mechanisms of mental disorders has been of no value to clinical psychiatry is not only wrong but also potentially damaging to our patients. We should discard it forthwith.

What then? We need to clarify our underlying assumptions. Psychiatry is a biomedical discipline which rests on scientific, empirical and eclectic foundations. We should acknowledge that a variety of approaches are required and may contribute to better outcomes for our patients and inform our research. Each should be judged on its merits and not disqualified by a sweeping generalisation. Clinical psychiatry requires a broadly based research approach. We should devote our energies to arguing for more funding to be devoted to tackle the problems of mental ill health overall as research in this area is still grotesquely underfunded (Kingdon, 2006a). Although progress in medicine is often slow and may come from unexpected directions, it does inexorably come. However, for people with mental illness to fully benefit from the application of modern medical science, both clear thinking and greater resources will be required.

Allan H. Young

FOR: REBUTTAL

Professor Young’s response is an eloquent exposition of the theoretical basis for biological research. However, it fails to address the motion proposed and to compensate he suggests that the motion be changed to ‘Clinical psychiatry requires a broadly based research approach’. He provides not one individual instance where research into putative biological mechanisms of mental disorders has led to developments in clinical psychiatry. Work on Alzheimer’s disease leading to memory-enhancing drugs is the arguable exception. However, unlike schizophrenia, depression and other mental disorders, the explicit biological basis of Alzheimer’s disease has been known since the 1800s and the condition has for decades been regarded as a neurological disorder in most European countries.

The argument that distinguishing biological psychiatry from other areas is erroneous seems difficult to sustain and would imply, for example, disbanding the Biological Psychiatry Section of the Royal College of Psychiatrists. Biology may be the study of life but so is sociology and psychology. Yet they are clearly not the same and giving pre-eminence to biology is precisely the concern that I and many others have. Guze’s article (Guze, 1989) is worth reconsideration because it illustrates, in its final paragraph, so clearly the way in which social context is distinguished from biology, and viewed as peripheral:

“No thoughtful and knowledgeable individual advocates an approach to psychiatry... that isolates it from its social and cultural context. But... biological concepts and approaches remain central and indispensable.”

Psychological therapy is only set in a biological context in the sense that it occurs in human beings and may be used alongside physical treatments. The argument that the clinical value of such therapy is a justification for biological research into putative mechanisms of mental disorder is entertaining but untenable.

Again the centuries-old assertion that genetic research has potential is made, but yet again there is no actual evidence of it being of any value. Seduction by emerging new technologies is understandable but exactly how is research into genetics going to assist us in clinical psychiatry? Multiple interacting genes seem unlikely to provide discrete pharmacological targets for intervention. Knowledge of such genes also seems unlikely to be helpful for meaningful genetic counselling or screening. Phenology had its advocates but lack of results and clinical application led to refocusing. Although it was justifiable to seek answers initially, when is it time to look elsewhere?

Professor Young accepts that the dexamethasone suppression test is outmoded but the statement that the dexamethasone/corticotrophin-releasing hormone test is on the ‘threshold of allowing us to specifically target some physical treatments’ has a sadly familiar ring to it. Treatments are asserted to exist that arose from biological research into the HPA, but these are still described as ‘showing promise’. Discrimination we agree is noxious and should be fought, but biological models appear to make matters worse (Cunningham-Owens et al., 2001; Angermeyer & Matschinger, 2005; Rathod et al., 2005). Solving the problem of stigma might be helped if we did not contribute to it in the first place by assigning incoherent and inaccurate terminology and conceptualisations: ‘dementia praecox’ replaced by ‘schizophrenia’ – semantically inaccurate and essentially meaningless, with increasingly damaging associations (Teskey, 2006) – and worse, ‘the deficit state’; ‘personality disorder’ is a similarly devastating term and is over-inclusive; ‘bipolar disorder’ is a confused
not even Professor Kingdon, would dispute that Kraepelin was a psychiatrist.

Professor Kingdon further states that research into ‘putative biological mechanisms’ has not led to developments in clinical psychiatry. An example which defeats Professor Kingdon’s argument is that of lithium. John Cade’s original work on lithium was based on research into a ‘putative biological mechanism of mental disorder’ – the role of urea in the pathophysiology of severe mental disorder. These enquiries evolved greatly from initial animal work through to the seminal publication on the use of lithium in patients (Cade, 1975). It is of course ironic that Cade’s initial notion about urea is now held to be wrong but, nevertheless, this was research which was initiated into a ‘putative biological mechanism of mental disorder’ and thus disproves Professor Kingdon’s case. It is also now quite clear that this resulted in ‘developments in clinical psychiatry’, more specifically a treatment of great benefit to many patients worldwide. Lithium has a sound evidence base backing its use in bipolar disorder and as an augmenting agent to antidepressants in unipolar depression (Bauer et al, 2003; Geddes et al, 2004). There is also convincing evidence that lithium reduces suicide and suicidality in severe affective disorders (Baldessarini et al, 2006). All of this derives from the initial research over half a century ago into ‘putative biological mechanisms of mental disorder’.

Professor Kingdon also makes a factual error when stating that distinguishing biological psychiatry from other areas is erroneous and would imply, for example, disbanding the Biological Psychiatry Section of the Royal College of Psychiatrists. As far as I am aware the Biological Psychiatry Section of the College is no more for precisely the reasons that Professor Kingdon states! Perhaps the more serious conceptual flaw however is the notion that psychology, sociology and biology are mutually incompatible and that one of these ‘ologies’ must somehow have primacy. Our strength as a medical discipline lies in our ability to utilise all of these approaches in an empirical manner to the maximum benefit of our patients.

Professor Kingdon is particularly exercised by genetics and repeatedly returns to attack this approach; one which, admittedly slowly, is paying dividends throughout diverse medical fields and increasingly in multifactorial illnesses. Of course some have been ‘seduced’ by genetics, but this is a phenomenon which is familiar in other approaches to psychiatric problems, perhaps most especially psychological treatments.

Molecular genetics supplies tools to help us identify the biological systems that are involved in psychopathology. This will allow development of treatments targeted at the systems (and in most cases not targeted at the genes or risk variants). It will also provide an approach to validating diagnosis, something which Professor Kingdon concedes is clearly necessary. Professor Kingdon reminds us that the late Professor Robert Kendell described the fundamental inadequacies of current classification systems a generation ago. However, he neglects to mention that Kendell pointed out that, like democracy, our current diagnostic system may be considered the worst – apart from all the others! Inadequate though it is, nobody, especially not Professor Kingdon, is proposing anything better.

Biological psychiatry has clearly been of value. It is worthwhile recalling that 2005 marked the centenary of the discovery of the Treponema pallidum by Schaudinn & Hoffmann. This was a milestone in the cure of general paralysis of the insane, one of the most frequent causes of devastatingly severe mental ill health until the first half of the 20th century (Nitrini, 2005). Before this happened, no doubt there were psychiatrists such as Professor Kingdon arguing that all the focus should go on the best social/psychological management as biological research had not been of value.

Allan H. Young

FOR: CONCLUSION

Professor Young’s further spirited response is a delight to critique. He seems to make the case that Alzheimer’s disease emerged in the early 20th century, not the 1800s, which accords with when Alzheimer described it. However, the neuropathological basis of dementia was recognised long before that date and indeed even before the descriptions of that acclaimed, if rather misguided psychiatrist, Kraepelin (Craddock & Owen, 2005). Moreover, it is really ironic that John Cade’s original work on the possible role of urea in mental disorder led to the discovery of the effects of lithium or wasn’t he simply wrong? The serendipity
that led to lithium being found to be of value in the treatment of bipolar disorder, eloquently described by Professor Young, has been of unquestioned benefit to many people, but is this really the only evidence of the benefit of systematic research into putative biological mechanisms?

I am indeed particularly exercised by the emphasis on genetics, as I would contend are most psychiatric journals and funding bodies internationally. It is just that after decades of research, I fail to see any dividends emerging in psychiatry; not slowly, not at all. If it were to assist in validation of diagnosis, that would be valuable but when will it? Other multi-axial classification systems based on vulnerability–stress models seem more likely to be clinically valuable (e.g. as we have begun to describe for psychosis; Kingdon & Turkington, 2005) and also relevant to resource usage. They certainly need further exploration. Incidentally I am also delighted to hear that the Biological Psychiatry Section of the Royal College of Psychiatrists has been disbanded.

Finally, before celebrating the discovery of Treponema pallidum, isn’t it appropriate to reflect on whether the research strategy of a century ago – heavily biologically based – now needs rethinking? My argument is not that we should, in principle, proscribe any research area – including that into putative biological mechanisms of mental disorder – but that any such area, especially where it has been so dominant a force in psychiatry for so long, should at least begin to demonstrate its clinical relevance.

David Kingdon

**Declaration of interest** None.

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**AGAINST: CONCLUSION**

Over the preceding few pages Professor Kingdon and I have debated the motion ‘Research into putative biological mechanisms of mental disorders has been of no value to clinical psychiatry’, with Professor Kingdon supporting the motion, and arguments against being put forward by myself. What lessons might we draw from this exchange or has it been simply a form of occupational therapy for two academic psychiatrists with nothing better to do, a form perhaps of ping-pong with obscure facts taking the place of a ball? I would respectfully suggest that a number of points emerge, some of which Professor Kingdon and I may even agree upon.

First, not only do psychiatrists enjoy debating (these two seem to at least!) but a debate such as this is clearly important. It is perfectly correct and proper to question the value of any avenue of research in psychiatry; indeed one might go further and say that it is legitimate to question any aspect of psychiatry whatsoever and of course this frequently happens. Unfortunately, those asking the questions are only rarely as well informed as Professors Kingdon and many are driven by ignorance or base motives. Nevertheless, psychiatrists must be prepared to engage in debates about the nature of our trade; to stay silent is not an option.

Second, many of the concerns voiced in this debate are widely held. Professor Kingdon is particularly exercised by the current emphasis on genetics but so, in one way or another, is most of the medical research community internationally. He is correct to state that after decades of research, we see few, if any, dividends yet emerging in psychiatry. He is sceptical of the ‘jam tomorrow’ argument, even though for some areas, such as pharmacogenetics, most of us accept this. However, these issues pertain to many other areas of medicine, reinforcing (at least to my mind) the commonalities and continuities between psychiatric problems and those dealt with by the rest of medicine. Professor Kingdon also argues (perhaps somewhat against himself) that he would not ‘proscribe any research area – including that into putative biological mechanisms of mental disorder’. We are finally entirely agreed upon something: every possible means of advancing knowledge to the end of greater clinical benefit in psychiatry should be open. From genetics through neuroimaging and psychopharmacology to psychosocial research and psychotherapy, all should be pursued and scrutinised equally based upon relevant merits. It’s all biology after all!

Allan H. Young

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Mental capacity in psychiatric patients
Systematic review

DAVID OKAI, GARETH OWEN, HUGH MCGUIRE, SWARAN SINGH, RACHEL CHURCHILL and MATTHEW HOTOPF

Background Mental capacity is central to legal and ethical debates on the use of compulsion in psychiatry.

Aims To describe the clinical epidemiology of mental incapacity in patients with psychiatric disorders, including interrater reliability of assessments, frequency in the psychiatric population and associations of mental incapacity.

Method Cross-sectional studies of capacity to consent to treatment for psychiatric patients were systematically reviewed from Medline, EMBASE and PsycInfo databases. Information on the reliability of assessments, frequency and associations of mental incapacity was extracted.

Results Out of 37 papers reviewed, 29 different capacity assessment tools were identified. Studies were highly heterogeneous in their measurement and definitions of capacity. Interrater reliabilities between tools were high. Studies indicate incapacity is common (median 29%) but the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of psychiatric in-patients have capacity, and the majority of psychiatric in-patients are capable of 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Mental capacity is a multidimensional construct that is a central determinant of an individual’s ability to make autonomous decisions. Its assessment has become increasingly important with the move away from the paternalistic role of healthcare professionals towards a greater emphasis on an individual’s own treatment decisions (Schneider, 1998). The American Psychiatric Association has developed a model statute which uses a mental capacity test (Stromberg & Stone, 1983). In many other jurisdictions mental capacity and mental health legislation have developed along different lines to deal with the specific needs of different groups of patients. In England and Scotland, mental capacity legislation has developed with the aim of providing a framework for people with either severe communication difficulties or cognitive problems (intellectual disability, dementia and other organic brain syndromes). In contrast, mental health legislation that does not use capacity tests generally applies a ‘status’ approach, whereby a wide range of treatments can be given to the patient on the basis of certain general conditions being met (e.g. the presence of a mental disorder, or the presence of perceived risk to the patient or others).

The use of status approaches has numerous implications. Under mental capacity legislation treatments are only provided in the patient’s best interests (with particular attention paid to previously expressed wishes, including advance directives, which have legal weight), whereas under mental health legislation best interests do not have to be considered, although in practice many psychiatrists effectively apply a best interests test (Peay, 2003). Further, the use of a ‘status’ approach means that the patient can be given a range of treatments, even if he or she might have capacity to refuse one or more of these. This has led some to suggest that current status-based approaches are anachronistic and unethical (Szmukler & Holloway, 1998) and that mental capacity and mental health legislation could be fused (Dawson & Szmukler, 2006).

A review of emergent case law literature in the USA (Grissos et al, 1997) has resulted in a ‘four abilities’ model, namely the ability to express a choice about treatment; the ability to understand information relevant to the treatment decision; the ability to appreciate the significance of that treatment information for one’s own situation; and the ability to reason with relevant information so as to engage in a logical process of weighing treatment options. Despite the influential work of the MacArthur Foundation (Grissos & Appelbaum, 1995a,b, Grissos et al, 1995), concern exists regarding the reliability of capacity assessments in individuals with a mental disorder, and the extent to which legislation that uses a capacity test covers the same or different groups of patients as mental health legislation which uses a status approach. Some have pointed to particular areas of perceived difficulty such as the area to appreciation, which may be difficult to operationalise (Saks et al, 2002; Breden & Vollmann, 2004).

Our aim was to make a systematic review of empirical, quantitative studies of mental capacity in order to answer the following three questions:

(a) Can the mental capacity of a patient be reliably assessed by two or more raters?
(b) What is the proportion of patients with psychiatric disorders in in-patient settings who are judged to lack capacity?
(c) What factors are associated with lack of capacity in individuals with psychiatric disorders?

METHOD

We aimed to identify all studies relevant to the aims of this review. Inclusion criteria were that the papers should be in the English language, describe defined populations of patients with psychiatric disorders; report quantitative research (i.e. research that produces numerical summaries of results, as opposed to qualitative research), and describe how the assessment of mental capacity was performed; capacity had to be
assessed in relation to a current treatment decision, as opposed to capacity to make advance directives, capacity to participate in research, testamentary capacity or capacity to stand trial. Studies were excluded if they were conducted on children or young people less than 18 years old; exclusively concerned organic psychiatric disorders (dementia or delirium) or intellectual disability; were case reports, commentaries or review articles; or were retrospective case-note reviews.

Search strategy
Relevant research articles were identified from a systematic search of electronic databases. These comprised PsycInfo (1967 to July 2006), Medline (1996 to July 2006) and EMBASE (1980 to July 2006). The electronic database search terms were divided into three sets: mental health legislation terms (e.g. Mental Health Act, coercion, patients’ rights), disorder terms (e.g. schizophrenia) and capacity terms (e.g. incompetence, capacity, autonomy). The titles and abstracts of all articles generated were examined on the above inclusion and exclusion criteria. If the reviewer was uncertain as to whether an article fulfilled these criteria, the full paper was requested. The main reviewer was D.O. and his decision to include or exclude studies was reviewed for 100 abstracts by G.O. There were disagreements in 10 papers but further examination indicated none would have been eligible for the final review. The interrater reliabilities of reviewers was good ($\kappa = 0.72$). These searches were augmented by personal correspondence with experts on mental capacity research. Experts were identified from the investigators’ prior knowledge and a delegate list from a recent UK seminar which had advertised for researchers working on this area and included several international speakers. The International Journal of Law and Psychiatry was hand-searched from the first to the most recent issue. Finally, the bibliographies of retrieved articles were used to identify further articles.

Data analysis
Articles were categorised and data extracted corresponding to our three main questions. We extracted data from the full-length articles using forms to ensure the process was standardised. D.O. performed the data extraction but all studies were checked independently by M.H. As the papers were heterogeneous a formal meta-analysis was not attempted. Where possible we present median values and interquartile ranges. Where the data provided were sufficient to calculate a kappa value, we did so in order to provide a uniform measure of interrater reliability.

**RESULTS**

The searches identified 15 490 references, which were scanned by abstract and title. On the basis of the abstract or title, 367 papers were reviewed; 316 did not meet the inclusion criteria, leaving 51 identified from the electronic search, many of which were known to us already. The original review was broader than the aims of the present paper (including mental capacity in individuals with medical illness or dementia) and we finally identified 37 papers relevant to this review (see data supplement to the online version of this paper).

**Capacity assessments**

The included articles reported many different methods for assessing capacity. Three used vignettes (Grisso & Appelbaum, 1995b; Grisso et al, 1995; Vellinga et al, 2004), which present the participant with a hypothetical patient facing a treatment dilemma, about which the participant is then asked to name a series of questions. Fourteen devised assessments of capacity for a specific procedure, for instance capacity to consent to electroconvulsive therapy, having a blood test or admission to a psychiatric ward (Appelbaum et al, 1981, 1998; Roth et al, 1982; Norko et al, 1990; Grisso & Appelbaum, 1991; Janofsky et al, 1992; Bean et al, 1994, 1996; Poythress et al, 1996; Tomoda et al, 1997; Paul & Oyebode, 1999; Wong et al, 2000, 2005; Vollmann et al, 2003). Sixteen (Hoffman & Srinivasan, 1992; Grisso et al, 1997; Melamed et al, 1997; Tomoda et al, 1997; Kitamura et al, 1998; Palmer et al, 2002; Bellhouse et al, 2003a,b; Lapid et al, 2003; Vollmann et al, 2003; Cairns et al, 2005a,b; Howe et al, 2003; Jacob et al, 2005; Koren et al, 2005; Beckett & Chaplin, 2006) used more flexible assessment methods, designed for use with any treatment decision. Studies generally framed capacity either in binary terms (i.e. present or absent for a specific decision) or as a continuous variable measured on a dimensional scale. A third approach adopted by some (Kitamura et al, 1998; Paul & Oyebode, 1999) was to describe the participant’s ability to meet increasingly stringent (binary) tests of capacity. Such studies combined aspects of both the multidimensional and binary approaches.

**Reliability of capacity assessments**

Seventeen studies reported interrater reliability of competency assessments. These had a median sample size of 56 participants (interquartile range 14–62). These studies could be categorised under three broad themes:

(a) binary decisions (capacity present or absent) using the same assessment tool and two or more raters;
(b) binary decisions comparing a clinician’s assessment with an assessment made by a clinical researcher using a mental capacity tool;
(c) score on an individual dimension of capacity measured on an assessment tool.

Where available, we report agreement using Cohen’s kappa, which is used as a measure of reliability taking into consideration the level of agreement expected by chance. Kappa takes a value between −1 and 1, and we define kappa scores as follows (Landis & Koch, 1977): <0, poor; 0–0.2, slight; 0.2–0.4, fair; 0.4–0.6, moderate; 0.6–0.8, substantial; 0.8–1, almost perfect.

**Reliability of binary assessment of mental capacity using interviews**

Five studies (Table 1) assessed mental capacity using two or more raters administering the same structured or semi-structured interview (Roth et al, 1982; Wong et al, 2000; Bellhouse et al, 2003a,b; Cairns et al, 2005b). Methods mainly involved raters assessing the same videotaped or transcribed interview performed by a single

<table>
<thead>
<tr>
<th>Study</th>
<th>$\kappa$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bellhouse et al (2003a)</td>
<td>0.74</td>
</tr>
<tr>
<td>Bellhouse et al (2003b)</td>
<td>0.75</td>
</tr>
<tr>
<td>Roth et al (1982)</td>
<td>0.81</td>
</tr>
<tr>
<td>Cairns et al (2005a)</td>
<td>0.82</td>
</tr>
<tr>
<td>Wong et al (2000)</td>
<td>0.87</td>
</tr>
</tbody>
</table>
Interviewer, although one paper described the results of two interviews performed by separate interviewers (Cairns et al., 2005b). Assessments used a variety of methods: one (Roth et al., 1982) used a derivative of a 15-item questionnaire (Roth et al., 1977); one used the MacArthur Competence Assessment Tool for Treatment (MacCAT–T) (Cairns et al., 2005b) and one used a semi-structured interview adapted from the MacCAT–T (Wong et al., 2000). Two papers described intrarater reliability on two different decisions (admission and treatment) in similar samples (Bellhouse et al., 2003a,b), using a checklist derived from English legal definitions. Kappa values ranged from ‘moderate’ to ‘almost perfect’ (median \( \kappa = 0.81 \) IQR 0.75–0.82). These results suggest that when a consistent approach is taken to the assessment of mental capacity, two or more raters can make a binary assessment with a high level of agreement.

**Binary decisions comparing a clinician’s assessment and that made by a clinical researcher using a mental capacity tool**

Six studies (Bean et al., 1996; Tomoda et al., 1997; Vollmann et al., 2003; Vellinga et al., 2004; Cairns et al., 2005b; Beckett & Chaplin, 2006) assessed agreement between an interviewer performing a structured or semi-structured mental capacity assessment and a clinician’s view of the patient’s mental capacity. The kappa values ranged from ‘slight’ to ‘substantial’, (median \( \kappa = 0.45 \) IQR 0.39–0.66). This suggests that when formal assessments are compared with clinical impressions, agreement is well above chance, but not as high as when two raters are using the same assessment tool. Clinicians universally reported fewer patients lacking mental capacity than did researchers.

**Other studies comparing agreement using dimensional scales**

Eleven studies addressed intrarater agreement on dimensional scales (Norko et al., 1990; Grisso & Appelbaum, 1991; Janofsky et al., 1992; Bean et al., 1994; Grisso et al., 1995, 1997; Palmer et al., 2002; Vollmann et al., 2003; Cairns et al., 2005b; Wong et al., 2005; Appelbaum & Redlich, 2006). These studies are difficult to summarise, since they tend to present correlation coefficients between raters on dimensional scales, or give kappa values for sub-scales of multidimensional scales. Deserving particular mention are the studies of Grisso and Appelbaum on the development of the MacCAT–T and related measures (Grisso et al., 1995, 1997), which present detailed analyses of intrarater agreement for each of the dimensions of the MacCAT–T and show that high intrarater correlations are the rule. Reliability indices were generally similar for each sub-scale of the MacCAT–T, suggesting that there is no single particularly hard-to-measure dimension (Grisso et al., 1997; Palmer et al., 2002; Vollmann et al., 2003; Cairns et al., 2005b).

**Frequency of mental incapacity in psychiatric patients**

**Admission to psychiatric units**

We identified five studies that assessed mental capacity in relation to admission to a psychiatric unit (Appelbaum et al., 1981, 1998; Norko et al., 1990; Poythress et al., 1996; Bellhouse et al., 2003a). One British study (Bellhouse et al., 2003a) described a mixed clinical population of patients and found that 67% had mental capacity to make the decision. Three studies (Appelbaum et al., 1981, 1998; Norko et al., 1990) described capacity to make this decision among voluntary patients admitted to psychiatric hospital. It is difficult to summarise the results of these studies since each presents more than one measure of incapacity; however, approximately 30–50% of participants scored in a range that suggests they were competent to make decisions, a sizeable minority scored in an intermediate range, and as many as 50% (Norko et al., 1990) had significant impairments of mental capacity despite accepting voluntary admission. One study (Poythress et al., 1996) described patients who were brought to hospital on a court order (of whom half subsequently accepted informal admission), and found that 55% had an impairment of capacity on a stringent definition and 35% had impairment on a less stringent definition.

**Psychiatric in-patients: other treatments**

Of the remaining studies of psychiatric patients, most described treatment for diverse interventions (Grisso & Appelbaum, 1991; Hoffman & Srinivasan, 1992; Janofsky et al., 1992; Grisso et al., 1995, 1997; Billick et al., 1996; Melamed et al., 1997; Tomoda et al., 1997; Kitamura et al., 1998; Melamed et al., 1999; Bellhouse et al., 2003b; Vollmann et al., 2003; Vellinga et al., 2004; Cairns et al., 2005b; Jacob et al., 2005; Beckett & Chaplin, 2006), whereas a few focused on either antipsychotic medication (Paul & Oyebode, 1999; Wong et al., 2005) or electroconvulsive therapy (Roth et al., 1982; Bean et al., 1996). In some studies the population was well defined, and a true cross-sectional study of consecutive patients had been performed. In others the population under study was much less well characterised, and convenience samples were used. For those 12 studies that provided a binary (present/absent) rating of mental capacity in the various psychiatric in-patient groups, estimates ranged from 10% to 95% of the participants lacking capacity (Table 2). However, all but two studies estimated that less than half of psychiatric in-patients lacked capacity, and the median value was 29% (IQR 22–44).

**Specific psychiatric diagnoses**

Four studies (Grisso & Appelbaum, 1995c; Grisso et al., 1997; Vollmann et al., 2003; Appelbaum & Redlich, 2006) presented the results of capacity assessments for patients with psychiatric diagnoses separately. Three used the MacCAT–T, and compared participants with schizophrenia or depression, all finding that impairments in mental capacity were much more common in the schizophrenia group. The MacArthur study (Grisso et al., 1997) found that 52% of patients with schizophrenia had impaired capacity, as opposed to 24% of those with depression. This study gave a further detailed breakdown of areas of difficulty, indicating that when individuals with schizophrenia had difficulties in decision-making, their appreciation, understanding and reasoning could all be affected. In contrast, decision-making difficulties in depression were mainly related to difficulties in appreciation. The third study (Vollmann et al., 2003) reported a remarkably consistent result: 53% of in-patients with schizophrenia were judged to lack capacity, as opposed to 20% of those with depression.

**Associations of mental incapacity in psychiatric patients**

Twenty-seven studies described associations of mental incapacity in psychiatric in-patients. These papers presented a range of variables, including socio-demographic factors (such as age, gender, educational level and ethnicity) as well as patient...
variables (such as cognitive abilities and whether the person was accepting or refusing treatment).

Socio-demographic variables

Fourteen studies (Appelbaum et al., 1981, 1998; Norko et al., 1990; Hoffman & Srinivasan, 1992; Bean et al., 1996; Billick et al., 1996; Grisso et al., 1997; Melamed et al., 1997; Paul & Oyebode, 1999; Palmer et al., 2004; Cairns et al., 2005a; Jacob et al., 2005; Wong et al., 2005; Beckett & Chaplin, 2006) presented results on gender, and none of these indicated an association. Thirteen studies presented results on age, with ten (Appelbaum et al., 1981; Billick et al., 1996; Grisso et al., 1997; Melamed et al., 1997; Palmer et al., 2004; Appelbaum & Redlich, 2006; Beckett & Chaplin, 2006; Cairns et al., 2005a; Jacob et al., 2005; Wong et al., 2005) describing no association and three (Roth et al., 1982; Norko et al., 1990; Appelbaum et al., 1998) describing an association with increasing age and mental incapacity. Results on socio-economic status were scarce, but of the four studies presenting associations, two described an association between mental incapacity and lower socio-economic status (Grisso & Appelbaum, 1995b; Roth et al., 1982), and two described no such association (Billick et al., 1996; Grisso et al., 1997). For educational attainment, two studies showed an association between incapacity and lower educational status (Roth et al., 1982; Wong et al., 2005) whereas the remaining eight showed no association (Grisso & Appelbaum, 1991; Billick et al., 1996; Kitamura et al., 1998; Paul & Oyebode, 1999; Palmer et al., 2004; Cairns et al., 2005a; Appelbaum & Redlich, 2006; Beckett & Chaplin, 2006). Seven studies assessed ethnic group, with six finding no association (Norko et al., 1990; Billick et al., 1996; Grisso et al., 1997; Appelbaum et al., 1998; Paul & Oyebode, 1999; Jacob et al., 2005). The one exception (Cairns et al., 2005a) showed an association between Black and minority ethnic group and mental incapacity, but the Black and minority ethnic group consisted of more individuals with psychotic illness and once this was controlled for the effect of ethnicity was lost.

Clinical variables

The other main variables to have been examined in the psychiatric studies were broadly clinical. When groups of patients with mixed diagnoses were examined, it was almost universally shown that capacity was more often impaired in individuals with psychotic illness than in individuals with non-psychotic illness (usually depressive disorder) (Grissone & Appelbaum, 1995c; Bean et al., 1996; Poythress et al., 1996; Bellhouse et al., 2003a; Vollmann et al., 2003; Appelbaum & Redlich, 2006). Most studies (Grisso & Appelbaum, 1995b; Billick et al., 1996; Grisso et al., 1997; Cairns et al., 2005a; Howe et al., 2005; Jacob et al., 2005; Wong et al., 2005; Beckett & Chaplin, 2006) although not all (Paul & Oyebode, 1999) – showed that severity of psychopathology was also associated with loss of capacity. Perhaps unsurprisingly, individuals who refused treatment were more often considered to be lacking capacity compared with those who accepted it (Roth et al., 1982; Bean et al., 1996; Melamed et al., 1997; Jacob et al., 2005) and a corresponding feature is that patients admitted involuntarily were more likely to lack capacity (Hoffman & Srinivasan, 1992; Bean et al., 1996; Poythress et al., 1996; Melamed et al., 1997; Appelbaum et al., 1998; Cairns et al., 2005a). Few studies of psychiatric patients have assessed the cognitive underpinnings of mental incapacity, but one intriguing study (Koren et al., 2005) showed that although problems with capacity were weakly related to performance on the Wisconsin Card Sorting Test (a measure of executive function), performance on a ‘metacognitive’ scoring system was much more closely related. The metacognitive scoring system emphasised the level of confidence patients had about their performance, and the degree to which this was at odds with actual performance was predictive of poor performance on the MacCAT-T.

DISCUSSION

We identified a number of studies that have used a systematic approach to measure mental capacity in individuals with psychiatric disorders. Although the methods used to measure capacity varied considerably, we have been able to address the three aims of this review. Our first aim was to determine whether mental capacity could be

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**Table 2**  Frequency of mental capacity among psychiatric in-patients

<table>
<thead>
<tr>
<th>Study</th>
<th>Participants (n)</th>
<th>Participants rated as having mental capacity % (95% CI)</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bean et al. (1994, 1996)</td>
<td>96</td>
<td>78 (70–86)</td>
<td>In-patients referred for ECT (13% detained)</td>
</tr>
<tr>
<td>Beckett &amp; Chaplin (2006)</td>
<td>50</td>
<td>38 (25–51)</td>
<td>In-patients with acute mania only; clinical assessment</td>
</tr>
<tr>
<td>Bellhouse et al. (2003b)</td>
<td>43</td>
<td>80 (73–87)</td>
<td>20% detained</td>
</tr>
<tr>
<td>Billick et al. (1996)</td>
<td>20</td>
<td>75 (56–94)</td>
<td></td>
</tr>
<tr>
<td>Cairns et al. (2005b)</td>
<td>112</td>
<td>56 (47–65)</td>
<td>Consecutive sample</td>
</tr>
<tr>
<td>Hoffman &amp; Srinivasan (1992)</td>
<td>60</td>
<td>35 (23–47)</td>
<td>47% of patients detained</td>
</tr>
<tr>
<td>Janofsky et al. (1992)</td>
<td>41</td>
<td>66 (51–81)</td>
<td>Included patients (n = 16) admitted to general medical ward</td>
</tr>
<tr>
<td>Kitamura et al. (1998)</td>
<td>48</td>
<td>76 (64–88)</td>
<td>All voluntary psychiatric patients</td>
</tr>
<tr>
<td>Melamed et al. (1997, 1999)</td>
<td>113</td>
<td>66 (57–75)</td>
<td>All voluntary patients; high standard of capacity based on presence of insight into disorder</td>
</tr>
<tr>
<td>Paul &amp; Oyebode (1999)</td>
<td>40</td>
<td>5 (0–13)</td>
<td></td>
</tr>
<tr>
<td>Roth et al. (1982)</td>
<td>57</td>
<td>71 (60–82)</td>
<td>In-patients referred for ECT; 7% detained</td>
</tr>
<tr>
<td>Vollman et al. (2003)</td>
<td>109</td>
<td>78 (70–86)</td>
<td>Only voluntary patients</td>
</tr>
<tr>
<td>Wong et al. (2000)</td>
<td>62</td>
<td>90 (82–98)</td>
<td>11% detained</td>
</tr>
</tbody>
</table>

ECT, electroconvulsive therapy.
assessed in a reliable manner. The answer to this question depends upon the study design. Studies that used a standardised assessment reported very high interrater reliabilities, with a median kappa of 0.81. Despite capacity being a complex, value-laden, multidimensional construct, this finding suggests that it can be assessed with greater reliability than cardiologists interpreting exercise electrocardiograms, radiologists interpreting mammograms or haematologists reading peripheral blood films (Sackett et al, 1991). When interrater reliability of single dimensions of capacity such as understanding is measured, results again suggest that these measures are highly reproducible. It is noteworthy that even dimensions such as reasoning and appreciation, which are hard to operationalise, are assessed with good interrater reliability. However, interviewers using standardised assessments agreed much less frequently with the clinicians who had been treating the study participants, and although this difference may be artefactual (under certain circumstances kappa values may be low despite good agreement) we think that it is probable that reliability is generally lower when a researcher’s assessment is pitied against that of a clinician. In general, clinicians were much less likely to judge a patient to lack capacity, and it may be that if a patient is prepared to accept the treatment proposed the issue of incapacity does not arise – the clinician presumes it is present. Clinicians might have a tendency to equate treatment refusal with incapacity and treatment acceptance with capacity. Alternatively, it might be that clinicians lack training or the time in which to perform careful assessments. Finally, although there is no gold standard criterion of capacity, it may be that formal assessments, although reliable, lack specificity and tend to ‘overdiagnose’ incapacity compared with the clinicians’ assessments.

The second question related to the frequency of incapacity to make key treatment decisions among patients with psychiatric disorders. Taking the median values as an approximate estimate, the results of the reviewed studies indicate that of in-patients with psychiatric disorders, a sizeable proportion – usually the majority – are capable of making treatment decisions. Indeed, the frequency of incapacity in psychiatric in-patients found in the reviewed studies did not differ greatly from that in general hospital in-patients (Raymont et al, 2004). The consistency of estimates of incapacity in psychiatric in-patients is striking, given the diverse nature of the populations studied. Half the studies estimated the frequency of participants’ lack of capacity to be within the range 22–44%. Similarly, the two studies to report on rates of incapacity in schizophrenia and depression found almost exactly the same rates, despite one being conducted in the USA and the other in Germany, where differences in healthcare systems might have led to differences in patient characteristics. This suggests that although diverse measures of mental capacity have been used, they are capable of making fairly consistent estimates.

The frequency of incapacity in voluntary patients when consenting to admission was remarkably high. This leads to a potential dilemma, as individuals lacking capacity may acquiesce to admission, but may lack protections that an admission under a legal framework would afford. Such patients may, to some extent, feel coerced into accepting admission, presumably since they felt that if they did not agree to an admission they would be detained anyway. Finally, the British studies of mental capacity (Bellhouse et al, 2003a; Cairns et al, 2005a) in those detained under the Mental Health Act 1983 indicated that a sizeable proportion have capacity to accept or refuse admission to hospital. Further work needs to be done to understand the implications of capacity-based mental health legislation for these individuals.

Mental capacity is not associated with any individual socio-demographic variable apart from advancing age. It is unclear why this should be, but it may be driven by cognitive decline or increased negative symptoms in older patients with psychotic illness. Given that mental capacity assessments are value-laden, it is reassuring that neither gender nor ethnic group has an effect; associations with educational level and social class are inconsistent. The clinical and legal variables associated with mental incapacity in the psychiatric groups should come as no surprise – psychosis, illness severity, involuntary admission and treatment refusal are all consistently reported as risk factors.

**Limitations of our review**

The most serious problem of a summary of capacity is that it is by nature a functional definition and to describe the frequency in a specific treatment setting is to ignore the fact that patients may have capacity for some decisions and not for others. It is likely that the variation in the results presented here stems from the heterogeneity of the patient groups, the range of capacity assessment tools used, the different legal standards for capacity assessment and the differences in treatment choices presented to participants. Furthermore, frequency of capacity in some of the primary research was not the main aim of the study and was reported as an incidental finding. Studies were often small, and many were not truly cross-sectional in that they did not define a clear population and sample from it, but instead used convenience samples. Participation rates were frequently unreported, and when they were, were often low. Little information was given about non-participants to allow inferences to be made about non-participation bias.

The primary studies are – with some notable exceptions – particularly weak in their reporting of data on associations. Similar difficulties have been observed in other systematic reviews of descriptive studies (Altman, 2000). We suspect that many of the studies emphasise ‘positive’ associations and fail to report ‘negative’ ones. This might lead to a bias, which would mean that conclusions would be more conservative than possibly indicated here. Many studies are statistically under-powered and report negative findings without any consideration of the possibility that a genuine difference was not detected because the sample size was too small. Nevertheless, the generally consistent negative findings in relation to demographic variables probably do reflect a true lack of association.

There are potential limitations of the review methods presented here. This review represents a novel use of systematic review methods, akin to recent developments in summarising information in diagnostics (Straus, 2006). There is a less well-trodden methodology for such reviews compared with reviews of randomised controlled trials. We excluded non-English language papers, and despite considerable effort might have missed relevant eligible papers owing to the diverse language used to describe mental capacity. We did not apply a pre-defined assessment of quality, as we reasoned that the primary studies were too heterogeneous in their designs to do this in a meaningful way.
Implications
A number of implications arise from this body of research. First, we have found that most studies report that most psychiatric in-patients are capable of making key treatment decisions; given that as many as a third of general medical patients lack mental capacity (Raymond et al., 2004), this should remind clinicians, policy makers and the general public that patients with psychiatric disorders are not intrinsically different and this may be important in campaigns against stigma. Equally important is the finding that many in-patients with psychiatric disorder lack capacity and there is a tendency for clinicians to underestimate this (especially when patients are accepting treatment) relative to research estimates. This underestimate may have the effect of underestimating clinical and social need.

Second, studies are consistent in showing the reliability of mental capacity assessments, and these measurements are correlated with indicators of clinical severity but not with demographic differences. This indicates that mental capacity can be reliably measured, and also that it has some criterion validity. These characteristics mean that it can, we believe, be researched in a useful manner. Third, there is little information on the points where mental capacity and mental health legislation do not overlap. The information from informal admissions suggests that a high proportion of patients may lack capacity – the question then is whether their treatment in an in-patient psychiatric setting is acceptable. A recent ruling by the European Court (HL v. United Kingdom, 2005) that the informal hospitalisation of an incompetent patient with intellectual disability was unlawful as he was deprived of his liberty in the absence of required safeguards (the Bournenwoood case) suggests that mental health providers – in Europe at least – will have to consider much more carefully the legal structures used in healthcare settings which may be judged to deprive individuals of liberty. Much less information exists on patients who have been detained under mental health legislation but are thought to retain capacity; more information is required on the nature of this group, the complexities of capacity assessment within it and the consequences of overriding capable decisions regarding treatment.

ACKNOWLEDGEMENTS
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Interventions for reducing the use of seclusion in psychiatric facilities

Review of the literature

CADEYRN J. GASKIN, STEPHEN J. ELSOM and BRENDA HAPPELL

Background  The authors of a recent systematic review concluded that the use of non-pharmacological containment methods, excluding restraint and seclusion, was not supported by evidence. Their focus on randomised, controlled trials, however, does not reflect the research that has been, or could be, conducted.

Aims  To find empirically supported interventions that allow reduction in the use of seclusion in psychiatric facilities.

Method  We reviewed English-language, peer-reviewed literature on interventions that allow reduction in the use of seclusion.

Results  Staff typically used multiple interventions, including state-level support, state policy and regulation changes, leadership, examinations of the practice contexts, staff integration, treatment plan improvement, increased staff to patient ratios, monitoring seclusion episodes, psychiatric emergency response teams, staff education, monitoring of patients, pharmacological interventions, treating patients as active participants in seclusion reduction interventions, changing the therapeutic environment, changing the facility environment, adopting a facility focus, and improving staff safety and welfare.

Conclusions  Reducing seclusion rates is challenging and generally requires staff to implement several interventions.

Declaration of interest  None.

Although some researchers have argued that the use of seclusion (the solitary confinement of psychiatric patients in bare rooms) can be of therapeutic value (Cotton, 1995), can prevent injuries and can reduce agitation (Fisher, 1994), this practice has been described as a form of social control over people already experiencing exclusion from the community (Morrall & Muir-Cochrane, 2002) and is frequently harmful or traumatic to patients (Frueh et al, 2005). Despite general movements in ethical principles and international law towards treating psychiatric patients within the least restrictive environment possible (Muir-Cochrane & Holmes, 2001), seclusion is still legally permitted (e.g. United Nations, 1991; Parliament of Victoria, 2006). Reducing the rates of seclusion requires the availability of feasible alternatives. Recently the authors of a systematic review concluded that current non-pharmacological practices for the containment of the behaviours of people who are disturbed or violent (excluding restraint and seclusion) were difficult to justify because their use was not supported by evidence from randomised controlled studies (Muralidharan & Fenton, 2006). Owing to their complexity, interventions to reduce seclusion rates do not lend themselves to evaluation using randomised controlled trials. There are many studies, however, in which researchers have used other methods to investigate the changes made in psychiatric settings to reduce the use of seclusion. We reviewed this literature.

RESULTS

Interventions to reduce rates of seclusion

Most of the studies on this topic are descriptions of how staff in psychiatric settings have developed complex interventions to reduce rates of seclusion. These interventions emerged following pressures, in either the internal or external environments, to reduce seclusion rates. Because the environments within these psychiatric facilities seem to have been quite heterogeneous, so too have been the approaches to reducing seclusion rates. We have synthesised the essences of each intervention, and this information, along with the outcomes of the changes, is presented in a data supplement to the online version of this paper. To
compare and contrast the interventions, we looked for common and unique features in the changes that were made in these psychiatric facilities. Although we discuss each feature separately, it is not our contention that any one of them would be sufficiently powerful in itself to reduce rates of seclusion; rather, successfully reducing seclusion rates may require the systematic use of several of these interventions—and possibly others—in response to the practice environments within psychiatric facilities. The interventions that we identified include state-level support, state policy and regulation changes, leadership, examinations of the practice contexts, staff integration, treatment plan improvement, increased staff to patient ratios, monitoring seclusion episodes, psychiatric emergency response teams, staff education, monitoring of patients, pharmacological interventions, treating patients as active participants in seclusion reduction interventions, changing the therapeutic environment, changing the facility environment, adopting a facility focus, and improving staff safety and welfare.

State-level support

Although most research was conducted at facility, unit or ward level, authors of one study reported on how the efforts made by a State Mental Health Authority (SMHA) were associated with reductions of seclusion rates in 70 institutions under its influence (LeBel et al, 2004). The SMHA assisted staff at child and adolescent inpatient facilities to reduce restraint and seclusion through frequent licensing and contract monitoring visits, in which strength-based care was discussed with staff, including the use of an individualised crisis prevention plan safety tool; assisting the organisation of peer-to-peer support for staff at the facilities to change workplace cultures and implement initiatives to reduce the use of restraint and seclusion; holding a state-wide best practice conference on restraint and seclusion reduction; requiring staff at each facility to develop a strategic plan incorporating strength-based care; facilitating restraint and seclusion grand rounds, in which conference presentations were made and SMHA staff assisted facility staff to develop their strategic plans and strength-based approaches; organising a conference, during which strategic plans and performance data relating to reduction of the use of restraint and seclusion were presented; and linking with other state agencies serving children and adolescents and enhancing supports for children and adolescents with histories of trauma. The reduced seclusion rates seem to have stemmed from the SMHA providing such support to institutions, rather than the SMHA changing regulations or policies and requiring institutions to adapt. During the 22-month period of the intervention the SMHA made no change to its regulations or policies.

State policy and regulation changes

Changes in state policy and regulations can sometimes shape interventions designed to reduce the use of seclusion. In the two studies where the involvement of the state in the area of seclusion practices had changed, there was increased emphasis on having tighter controls on when and how seclusion may be used, greater oversight of seclusion episodes through the appointment of an independent advocate for consumers, the introduction of a ‘recovery approach’ to caring for patients (Smith et al, 2005) and the requirement for post-seclusion debriefings with staff and patients. These changes necessitated, or formed part of, initiatives within the psychiatric facilities to reduce rates of seclusion.

Leadership

Although leadership would have had some impact on the design, implementation and monitoring of all the interventions included in this review, several authors described some of the leadership behaviours that contributed to organisational changes. External to psychiatric facilities, chief psychiatrists and community advocates for psychiatric patients can influence the policies and practices of those facilities (Smith et al, 2005). Internally, the management of these facilities were involved with setting new expectations for staff to reduce the use of seclusion (Sullivan et al, 2005), reviewing seclusion policies (Kalogjera et al, 1989; Fisher, 2003), publicly advocating for seclusion reduction (Fisher, 2003; Sullivan et al, 2005), changing systems of practice to make seclusion reduction a priority (Schreiner et al, 2004), providing staff with resources to enable seclusion rates to be reduced (e.g. education; Schreiner et al, 2004), introducing an audit tool to capture information about each restraint or seclusion episode (Taxis, 2002) and modelling crisis de-escalation techniques (Schreiner et al, 2004).

Examinations of the practice contexts

Some psychiatric facilities formally established the context in which staff intended to make changes (Fisher, 2003; Schreiner et al, 2004). Through such an evaluation, systemic weaknesses that contributed to patients being secluded could be identified. Tools such as staff surveys (Fisher, 2003), collecting baseline data on the use of seclusion, interviews with staff and patients, and observations of crisis events on units (Schreiner et al, 2004) have informed the development of interventions that have contributed to decreases in seclusion rates. Once weaknesses had been highlighted, programmes were designed to improve how staff manage crises or potential crises.

Staff integration

During three of the interventions, management enhanced the focus on reducing seclusion rates through employing new staff (Smith et al, 2005) or by increasing the extent of cross-disciplinary collaboration (Donovan et al, 2003). In the first of these studies (Smith et al, 2005), new staff became available for employment owing to the closures of other facilities across the state. These new staff were already challenging the use of restrictive procedures in the facilities at which they were previously employed and, therefore, were able to contribute positively to efforts to reduce the rates of seclusion. In the other study (Donovan et al, 2003) an interdisciplinary committee was established to oversee the development of the programme to reduce the use of seclusion. This committee comprised administrators and staff who had different roles within the hospital (e.g. counsellors, nurses, physicians, psychologists and social workers). This cross-disciplinary involvement helped engender widespread support for the reform of seclusion and restraint practices.

Treatment plan improvement

In one study the authors described how initiatives were undertaken to improve the patients’ treatment plans (Donat, 2003). The hospital management created a behavioural consultation team to work with all areas within the hospital to provide input into treatment plans from a behavioural perspective. There was also an increase in
the number of quality standards for assessing behaviour plans (from 16 to 44) and the introduction of an additional set of 54 quality standards for formal behavioural assessments.

**Increased staff to patient ratios**

In two studies improvements in the staff to patient ratios were part of the agenda for change (Donat, 2003; Smith et al., 2005). During 5 years of an intervention in a public psychiatric hospital, the ratio of staff (including all facility staff) to patients increased from 2 to 1 in the first month to 3.3 to 1 in the last month (Donat, 2003). The authors did not report, however, how staff to patient ratios changed in the wards. At Pennsylvania State Hospital the staff to patient ratios on hospital units improved over a 10-year period, through decreasing the number of patients on a typical unit (from 36 to 32 or fewer) and increasing the number of staff per unit (from one licensed nurse and three psychiatric aides to two licensed nurses and four psychiatric aides; Smith et al., 2005). The authors contend that this change in the staff to patient ratio contributed to staff being able to provide more sensitive care than they had been able to give in the past and to a safer environment for both staff and patients.

**Monitoring seclusion episodes**

Psychiatric facilities commonly collected data on episodes of seclusion and these data were used for clinical, educational, managerial, and publicity purposes (Kalogjera et al., 1989; Taxis, 2002; Donat, 2003; Donovan et al., 2003; Fisher, 2003; Schreiner et al., 2004; Smith et al., 2005). Management used these data to detect both general seclusion patterns over time and to identify outlier patients (Schreiner et al., 2004). Data on general patterns were used to facilitate interhospital comparison of the use of seclusion (Smith et al., 2005), to enable performance to be compared with unit and hospital goals (Donovan et al., 2003) and to inform the development of staff education programmes (Taxis, 2002). In an adolescent in-patient unit (Schreiner et al., 2004) and a public psychiatric hospital for adults (Donat, 2003), one of the foci for staff was on analysing outlier data. At the public hospital, for example, the criteria for the review of patients with multiple episodes of seclusion or restraint were modified so that they were evaluated after fewer episodes or less time in seclusion or restraint (Donat, 2003). The necessity for patients to exceed six episodes or 72 h of restraint or seclusion within 1 month before a review would occur was replaced with the criteria of two episodes or 8 h during 1 week.

In contrast to most of these facilities, in which staff monitored data on seclusion and restraint, members from a development committee in a child and adolescent psychiatric hospital were involved with observing the behaviours of staff and patients on hospital wards (Donovan et al., 2003). These observations were undertaken to ascertain the frequency with which aspects of an intervention to reduce the use of seclusion and restraint were carried out. Using data gained from these observations, committee members also provided staff with additional education about aspects of the intervention that staff were not employing effectively or that concerned staff, reinforcement of the intervention’s philosophy and support for staff skill development.

Post-event analyses were a further method by which seclusion episodes were monitored (Fisher, 2003). In a state psychiatric hospital, changes in policies at state and hospital levels required that all episodes of seclusion be subject to post-event analyses, which staff involved in the seclusion or restraint, along with their supervisors, conducted. The focus of these analyses was on ascertaining how staff handled the events, on what staff could have done differently to avoid placing patients in seclusion or restraints, and on developing plans to try to prevent such episodes recurring.

**Psychiatric emergency response teams**

In several state hospitals (Smith et al., 2005) and in a psychiatric emergency service (D’Orio et al., 2004), staff introduced psychiatric emergency response teams for behavioural emergencies. To become a member of one of these teams, staff participated in additional training to enhance their skills to manage crisis situations in such ways that they refrain from using restrictive procedures. To defuse crisis situations, staff primarily used their skills in verbal de-escalation by way of violence prevention skills, therapeutic communication, mediation and conflict resolution.

**Staff education**

The education of staff was central to the efforts of many organisations to reduce seclusion (Kalogjera et al., 1989; Taxis, 2002; Fisher, 2003; D’Orio et al., 2004; Schreiner et al., 2004; Sullivan et al., 2004, 2003; Smith et al., 2005; Bowers et al., 2006; Greene et al., 2006). Education was focused on two main areas: the implementation of new models of care and alternative behavioural interventions to seclusion. New models of care came from the authors’ work on the development of high-therapy, low-conflict wards (Bowers et al., 2006) or on collaborative problem-solving (Greene et al., 2006). Education in alternative behavioural interventions tended to have several components. The educational programme at one state psychiatric facility, for example, involved learning to identify the behavioural indicators of impending violence, to collaborate with others and to use verbal de-escalation techniques, to intervene in a crisis, to employ diversional activities, to consider the ethics involved with restraint and seclusion, to improve documentation skills, to apply therapeutic interventions with patients who had personality disorders, and the use of medications with aggressive patients (Taxis, 2002).

Some of this education occurred in one-to-one discussions and during problem-solving exercises. Staff at this facility also used information gained through their evaluations of restraint or seclusion episodes to design targeted education to address areas of concern.

On one adolescent in-patient unit, part of the education involved members of the committee responsible for implementing the intervention modelling de-escalation techniques for other staff (Schreiner et al., 2004). The members of the committee were demonstrating how these techniques could be put into practice. This modelling was supported through training at in-service meetings, reviews that debunked myths about seclusion and restraint, continued reinforcement of strategies to reduce the use of restraint and seclusion, and providing staff who were key decision-makers in crisis situations with additional training in patient-specific de-escalation strategies and in early crisis intervention.

**Monitoring of patients**

In one study the monitoring of patients was increased through the installation of an additional camera (D’Orio et al., 2004). This increase in the number of cameras in operation (from four to five) was in response to members of the safety committee believing...
that patients were being inadequately monitored.

Pharmacological interventions

Although we excluded studies from this review in which the prime focus was on the evaluation of pharmacological intervention, some researchers stated that changes in pharmacological interventions (chiefly the introduction of second-generation antipsychotics) occurred as part of several changes within the psychiatric facilities (Fisher, 2003; Smith et al, 2005). In one state psychiatric hospital, two aspects of the pharmacological treatment of patients were emphasised (Fisher, 2003): first, clozapine was used more frequently to control aggressive behaviour; second, in their care of individual patients who showed no signs of improvement with established pharmacological solutions, staff continued to try other pharmacological treatments which had only received support from a few trials or case studies.

Treating patients as active participants in seclusion reduction interventions

Some staff at psychiatric facilities enlisted the support of patients in their efforts to reduce seclusion rates (Mistral et al, 2002; Schreiner et al, 2004). The staff at one adolescent in-patient unit gained support from patients through discussing the goal of seclusion reduction with them and emphasising the positive outcomes that might eventuate from reducing the use of seclusion and restraint on the unit (Schreiner et al, 2004). Staff also reviewed standard therapeutic de-escalation strategies with patients and introduced a reward system for patients based on the number of seclusion and restraint episodes. On a high-care psychiatric ward, staff worked with patients to reduce the use of seclusion through clarifying therapeutic aims with patients and implementing rules with regards to drinking alcohol, using illicit substances, smoking and the upkeep of the environment. Patients seemed to internalise the rules for the upkeep of the environment and began enforcing these rules with fellow patients.

In an adult psychiatric service, management placed an expectation on staff that they allow patients to choose interventions to be used in managing their aggression (Sullivan et al, 2005). In consultation with patients, clinicians completed a patient violence assessment tool, which had sections requiring detail on the relevant histories of patients and precipitants to their violence; how patients tended to display agitation, aggression and violence; and interventions that patients might find useful at times when they potentially could lose control.

Changing the therapeutic environment

Making changes to the therapeutic environment was a common way in which staff at psychiatric facilities tried to reduce seclusion rates (Kalogjera et al, 1989; Mistral et al, 2002; Taxis, 2002; Donovan et al, 2003; Fisher, 2003; Sullivan et al, 2004, 2005; Smith et al, 2005; Bowers et al, 2006; Fowler, 2006; Greene et al, 2006; Regan et al, 2006). Staff at some of these facilities adopted new therapeutic frameworks to guide practice. These frameworks included a collaborative problem-solving approach (Greene et al, 2003) at a child in-patient psychiatric unit (Greene et al, 2006); a working model for the development of high-therapy, low-conflict psychiatric wards (Bowers et al, 2006); an ‘ABCD’ (autonomy, belonging, competence, doing for others) programme at an adolescent psychiatric hospital (Donovan et al, 2003); the use of dialectic behaviour therapy (Linehan, 1993) at a state psychiatric hospital (Fisher, 2003); a therapeutic management protocol on three in-patient adolescent psychiatric units (Kalogjera et al, 1989); a philosophy of child- and family-centred care (Ahmann & Johnson, 2000) at a child psychiatric unit (Regan et al, 2006); and treatment based on therapeutic community principles (Jansen, 1980) at a high-care psychiatric ward (Mistral et al, 2002). In addition, staff at an adult psychiatric service shifted their treatment paradigm from one of staff fear and control to one of patient empowerment and collaborative relationships (Sullivan et al, 2005).

Staff at some facilities improved the therapeutic environments through increasing the frequency with which they communicated with patients about their needs (Sullivan et al, 2004) and their care (Mistral et al, 2002). On a daily basis at an in-patient acute psychiatric care unit, for example, staff assessed patients’ mental states and their risks of committing violent or harmful acts to themselves or to others (Sullivan et al, 2004). These assessments were used in the development of 24-h individual service plans for patients.

In two facilities the debriefing of patients following episodes of seclusion was part of the changes made to practice (Fisher, 2003; Sullivan et al, 2004). In a psychiatric hospital, for example, debriefing occurred between the patients who were placed in seclusion and their treatment teams (Fisher, 2003). These debriefings focused on the patient’s and team’s views of the patient’s behaviours that led to the seclusion and on planning to avoid recurrences of such behaviours.

In a rare example of a single intervention being used in an attempt to reduce the use of seclusion, staff at a residential treatment centre for adolescents informed patients that they could request aromatherapy if they were feeling agitated (Fowler, 2006). This intervention appeared to have a positive effect on the number of seclusions, because there were more of these episodes in the 3 months prior to the use of aromatherapy (n=29) than during the 3 months following the introduction of this treatment (n=20).

Changing the facility environment

Authors of three studies reported that facility environments were changed to reduce the likelihood that patients would be placed in seclusion (Mistral et al, 2002; Taxis, 2002; Regan et al, 2006). In two of these facilities the physical environment was improved (Mistral et al, 2002; Taxis, 2002), whereas in the other facility the opening hours of the unit were extended to 24 h per day for parents, in keeping with the philosophy of child- and family-centred care (Regan et al, 2006).

Adopting a facility focus

In one study, the objectives of the intervention were broader than focusing on reducing the numbers of episodes of seclusion and restraint (Mistral et al, 2002). Through taking a broader approach to improving how a psychiatric facility operates, the use of seclusion and restraint may be reduced. Staff on this ward timetabled a schedule to improve how the ward operated. Regular staff meetings were held to discuss practical issues on the ward and monthly meetings were held between community and ward staff. In addition, meetings were conducted with an outside facilitator to analyse the root causes of ward issues and to produce possible solutions.

Improving staff safety and welfare

Staff at some psychiatric facilities instigated changes to practice to enhance the safety
and welfare of staff (Mistral et al, 2002; Sullivan et al, 2004). In one in-patient acute psychiatric unit, staff had reported experiencing burnout due to continuously caring for acutely unwell patients (Sullivan et al, 2004). To reduce this burnout, staff were rostered between caring for acutely unwell patients and caring for those who were less unwell. To improve staff safety on one ward at another facility, staff were educated in risk assessment and in techniques for controlling and restraining patients, and were issued with personal alarms (Mistral et al, 2002). In addition, if a patient assaulted a member of staff the incident was immediately reported to police. This action reinforced patients’ awareness of how serious it was to assault a staff member.

**Intervention outcomes**

The main variable of interest in this review is the number of seclusion episodes. In all but one study in which the researchers reported seclusion data (Bowers et al, 2006), the number of episodes of seclusion, or rate of seclusions, decreased with the implementation of the interventions (Mistral et al, 2002; Schreiner et al, 2004; Sullivan et al, 2004, 2005; Smith et al, 2005; Fowler, 2006). For the studies in which the data on seclusion are obscured through their combination with restraint data, the authors reported decreased use of seclusions and restraints with the implementation of the interventions (Kalogiera et al, 1989; Taxis, 2002; Donat, 2003; Donovan et al, 2003; Fisher, 2003; D’Orío et al, 2004; LeBel et al, 2004; Greene et al, 2006; Regan et al, 2006). Although none of this research had an experimental design, and therefore causation cannot be implied, the weight in number of these studies provides strong evidence that the use of seclusion in psychiatric facilities might be greatly reduced, if not discontinued entirely.

**DISCUSSION**

There is strong evidence that supports the use of interventions to reduce the use of seclusion in psychiatric facilities. The interventions we reviewed were complex and typically involved changing several aspects of the organisation. The impetus for change came either from external pressures (e.g. state law changes, chief psychiatrists, consumer groups) or from staff within the organisations. Such changes tended to be unique to each facility and in response to practices and policies that staff perceived as enabling the use of seclusion. Common features of the programmes for change at many of these facilities, however, were leadership, the monitoring of seclusion episodes, staff education and changing the therapeutic environment.

Our findings challenge the outcome of a recent systematic review in which it was concluded that the use of current non-pharmacological practices for the containment of the behaviours of people who are disturbed or violent (e.g. behavioural contracts, de-escalation, locking doors, special observations) were difficult to justify (Muralidharan & Fenton, 2006). Although these authors’ conclusion is understandable with respect to the literature selected using the narrow criteria of the systematic review (e.g. randomised controlled trials), it does not reflect the research that has been conducted, or could possibly be performed, in psychiatric settings. Designing randomised controlled trials to evaluate the efficacy of alternative, non-pharmacological containment strategies in settings where there is much variability in facilities, in organisational culture, and in patient and staff behaviour is fraught with difficulties. Investigating alternative containment strategies, implemented to reduce seclusion rates, requires psychiatric facilities to be the unit of analysis, rather than staff and patients within one section (e.g. a ward) of a psychiatric facility. Finding a sample of psychiatric facilities that are sufficiently homogeneous to allow a randomised controlled trial that would involve significant organisation change seems overly ambitious, if not totally unfeasible. A more pragmatic approach, such as using rigorously designed case studies, may be needed for this line of research.

Owing to the complexity of the interventions used in these facilities, it is difficult to assess which interventions – if any – were efficacious in producing the reduction in the use of seclusion. Even so, knowledge in the area of reducing the use of seclusion can advance further if researchers continue to report the interventions that are effective in psychiatric facilities. The literature would also benefit greatly from reports of any failed attempts to reduce the use of seclusion. Through sharing such experiences, researchers and practitioners will be able to develop sound strategies for the reduction of the use of seclusion in psychiatric facilities.

**REFERENCES**


Ethnic variations in the experiences of mental health service users in England

Results of a national patient survey programme

VEENA S. RALEIGH, ROBERT IRONS, EMMA HAWE, SARAH SCOBIE, ADRIAN COOK, RACHEL REEVES, ANN PETRUCKEVITCH and JULIETTE HARRISON

Background Minority ethnic groups in the UK are reported to have a poor experience of mental health services, but comparative information is scarce.

Aims To examine ethnic differences in patients’ experience of community mental health services.

Method Trusts providing mental health services in England conducted surveys in 2004 and 2005 of users of community mental health services. Multiple regression was used to examine ethnic differences in responses.

Results About 27,000 patients responded to each of the surveys, of whom 10% were of minority ethnic origin. In the 2004 survey, age, living alone, detention and hospital admissions were stronger predictors of patient experience than ethnicity. Self-reported mental health status had the strongest explanatory effect. In the 2005 survey, the main negative differences relative to the White British were for Asians.

Conclusions Ethnicity had a smaller effect on patient experience than other variables. Relative to the White British, the Black group did not report negative experiences whereas the Asian group were most likely to respond negatively. However, there is a need for improvements in services for minority ethnic groups, including access to talking therapies and better recording of ethnicity.

Declaration of interest None. Funding detailed in Acknowledgements.

Patients from Black and minority ethnic groups in the UK are generally perceived to have a poor experience of mental health services. However, robust comparative information in this area is scarce. Inside Outside highlighted the need for a national strategy to address the mental health needs of Black and minority ethnic groups (Department of Health, 2003). Delivering Race Equality in Mental Health Care outlined an action plan for tackling ethnic inequalities, one of its goals being increased satisfaction with services among patients from Black and minority ethnic groups (Department of Health, 2005). The Department of Health’s standards require equity in access to services for minority groups and include a national target for improvements in patient experience as measured by national, validated surveys (Department of Health, 2004).

The Healthcare Commission coordinates a national programme of patient experience surveys on behalf of the Department of Health. This paper analyses ethnic variations in patient experience as reported in the 2004 and 2005 surveys of 26,625 and 25,143 users of community mental health services respectively across all National Health Service (NHS) mental health and primary care trusts providing mental health services in England. Surveys of mental health service users on this scale are unprecedented and offer a unique opportunity for analysing ethnic differences. This paper builds on previous analyses of ethnic variations in patients’ experience of NHS services (Commission for Health Improvement, 2004; Healthcare Commission, 2005a, 2006).

METHOD

The 2004 and 2005 postal questionnaire surveys of users of community mental health services included all 81 NHS mental health trusts and primary care trusts providing mental health services in England. The surveys were approved by the Multi-Centre Research Ethics Committee for Scotland.

The questionnaire was developed following a review of the published literature on surveys of mental health service users (although there had been very few community-based surveys) and of the survey tools currently in use by NHS mental health trusts. Telephone and face-to-face interviews were carried out with mental health professionals and voluntary sector organisations to identify the issues they thought important to include. The information was used to construct a topic guide for use in focus groups with mental health service users, including those from Black and minority ethnic groups, in different parts of England. The results were used to construct a draft questionnaire, which was tested in cognitive interviews for face validity, comprehensibility and salience with people with mental health problems. Following consultations with an advisory group, including members of the Department of Health’s Mental Health Task Force and service user group leads, the questionnaire was piloted before the surveys were launched.

Trusts were given detailed written guidance on sampling methods and advice on sampling was available from the NHS Surveys Advice Centre. To construct the sampling frame, trusts were asked to compile a list of service users aged 16–64 years on care programme approach (CPA; standard or enhanced) who had been seen within the 3 months prior to each of the surveys. They were asked to ensure that all separate CPA lists were combined and that any lists not held electronically were included. Trusts were asked to exclude service users that had been seen only once overall, current in-patients, those who had had no contact with NHS mental health services in the past 3 months and those that did not have a known UK address. Furthermore, prior to the survey a number of reviews of the quality of CPA lists were carried out; one of these is included in the Mental Health Survey Development report (Osborn et al, 2004). Full details of the sampling instructions can be found at http://www.nhssurveys.org/docs/MH2005_Guidance_v1.pdf

For each of the surveys, trusts were asked to take a simple random sample of 850 service users from their population lists. Detailed instructions on doing this using the Rand function in Excel were
ETHNIC VARIATIONS IN EXPERIENCES OF SERVICE USERS

provided. The sample was not stratified by CPA level or by any other variable, because it was considered more important to minimise the risk of trusts making sampling errors by keeping the sampling instructions simple. Non-responders were sent up to two reminders.

The analysis is based on the national data-set for each of the two surveys. Although the sample was designed to be restricted to service users aged 16–64 years, some trusts included those over 64 years; these records were excluded from the analysis. The questionnaire used the 16 ethnic categories in the 2001 population census in England and Wales conducted by the Office for National Statistics (ONS). For the analysis, the ONS census ethnic categories were grouped as: White British; White Irish; White Other; Mixed (White–Black Caribbean, White–Black African, White Asian, Mixed Other); Asian or Asian British (Indian, Pakistani, Bangladesh, Asian Other); Black or Black British (Black Caribbean, Black African, Black Other); Other (Chinese, Other).

For the 2004 survey, we analysed ethnic differences in experience of using services. The questions were grouped into domains of experience, developed jointly by the Department of Health and the Healthcare Commission with advice from the Picker Institute Europe, as follows: access and treatment, more choice (information); building relationships (relationships).

For the 2005 survey, we analysed ethnic differences in patients’ access to services and treatments, based on binary responses to individual questions. The White British group was used for comparison. Logistic regression was used to examine ethnic differences after controlling for selected independent variables. Adjustment was made for the same variables as in the 2004 survey, with two exceptions: the question on living alone was not included in the 2005 questionnaire and information on CPA status was more complete in the 2005 survey and hence was included in the analysis.

Results by ethnicity are presented after forcing all covariates into the model. Conclusions from models reduced using a stepwise approach to contain only significant covariates were highly similar. Statistical analysis was conducted using STATA version 8.0 for Windows. Details of the surveys, questionnaire, domain score methodology and trust-level results are available (Healthcare Commission, 2004, 2005b).

RESULTS

A total of 27,398 and 26,555 service users responded to the 2004 and 2005 surveys respectively, with overall response rates of 41 and 40% respectively. It was not possible to calculate response rates for ethnic groups with any degree of accuracy because, although self-reported ethnicity was available for 97% of respondents to both surveys, ethnicity was grossly under-coded in the sample records. In the 2004 survey, 50% of the 67,179 sample records did not have an ethnic code and in a further 1% self-reported ethnicity in survey respondents did not match ethnicity in the trust record. Moreover, it is not known whether there were any ethnic-specific biases between where ethnicity was or was not recorded in trust records. Finally, in trust records ethnicity was often coded with a general term such as White/Black/Asian rather than one of the 16 ONS categories used in the survey questionnaires. For these reasons, any comment on response rates by ethnicity has to be very tentative. Based on the partial information available, the indications were that response rates were lower among minority ethnic groups: in the 2004 survey they were 33, 32 and 45% in the Asian, Black and White groups respectively, and in the 2005 survey the corresponding figures were 30, 30 and 41%.

In both the 2004 and 2005 surveys, 10% of respondents were of Black and minority ethnic origin (i.e. excluding White British; 2745 and 2559 respectively; Table 1). The ethnic composition of respondents was similar across the two surveys.

The characteristics of respondents were also similar across the two surveys (Table 2). In both surveys, respondents from minority ethnic groups, other than the White Irish group, were younger than the White British group. Female respondents outnumbered male respondents except in the Asian group in the 2004 survey and in the Black group in the 2005 survey. The proportion living alone (only available for the 2004 survey) was highest in the Black group, being almost three times greater than in the Asian group. In both surveys, the proportions in paid work were lowest among the Asian, Mixed, Black and Other (Chinese, Other).

Table 1: Ethnic group of respondents to the 2004 and 2005 surveys of users of community mental health services in England

<table>
<thead>
<tr>
<th>Ethnic group</th>
<th>2004 survey (n=26,625)</th>
<th>2005 survey (n=25,143)</th>
</tr>
</thead>
<tbody>
<tr>
<td>White British</td>
<td>23,880 (89.7)</td>
<td>22,584 (89.8)</td>
</tr>
<tr>
<td>White Irish</td>
<td>369 (1.4)</td>
<td>368 (1.5)</td>
</tr>
<tr>
<td>White Other</td>
<td>610 (2.3)</td>
<td>530 (2.1)</td>
</tr>
<tr>
<td>Mixed</td>
<td>329 (1.2)</td>
<td>336 (1.3)</td>
</tr>
<tr>
<td>Asian</td>
<td>702 (2.6)</td>
<td>688 (2.7)</td>
</tr>
<tr>
<td>Black</td>
<td>622 (2.3)</td>
<td>514 (2.0)</td>
</tr>
<tr>
<td>Other</td>
<td>113 (0.4)</td>
<td>123 (0.5)</td>
</tr>
</tbody>
</table>

305
White Irish groups. Self-reported mental health status was poor/very poor in about one-quarter of respondents in most ethnic groups in 2004 and in about one-fifth in 2005; in both surveys, the proportion was significantly lower in respondents from the Black group (15.2 and 12.1% respectively). The proportion of respondents with at least one hospital admission for mental health reasons, or detention under the Mental Health Act 1983, in the past year was higher among minority ethnic groups than in the White British group, the proportions detained in the Black group being more than double those in the White British group in both years. Minority ethnic groups, the Black group in particular, were also more likely to be on enhanced CPA.

For the 2004 survey, we analysed ethnic differences in patients’ overall experience of using services (classified by domains of patient experience) after controlling for the independent variables (Table 3). Compared with the White British group, patient experience scores were lower for the White Other group for the access and information domains, and overall. For the Asian group, scores for the information domain were lower than for the White British group, and scores for the coordination domain were higher. Scores for respondents from the Black group were higher than for the White British group for the coordination and relationships domains.

The regression analysis (Table 4) showed the extent to which the independent variables predicted patient experience scores. Although ethnicity was a significant predictor of patient experience for some ethnic groups for some domains, overall some other independent variables had stronger effects. Self-reported mental health status had the strongest explanatory effects across all domains and overall, with respondents in poor health responding more negatively. Increasing age was a significant, positive predictor of domain scores. Living alone, detention and hospital admissions in the past year were negatively associated with patient experience.

For the 2005 survey, we analysed ethnic differences in patients’ access to services and treatments, based on responses to individual questions and with the White British group as the baseline for comparison. Odds ratios from the regression analysis are given in Table 5. Overall, 84% of respondents had been in contact with mental health services for over a year and about half for over 5 years. After adjusting for the independent variables, the White Other, Asian and Other groups were more likely to have had a shorter duration of contact with mental health services (i.e. under 1 year) than the White British. Overall, 83.6% of respondents said they had seen a psychiatrist in the past 12 months. Except for the Other group, there were no ethnic differences from the White British group for being seen by a psychiatrist in the past

### Table 2: Characteristics of survey respondents by ethnic group for 2004 and 2005 surveys

<table>
<thead>
<tr>
<th>Variable</th>
<th>White British</th>
<th>White Irish</th>
<th>White Other</th>
<th>Mixed</th>
<th>Asian</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years: mean</td>
<td>44.8</td>
<td>44.5</td>
<td>48.3***</td>
<td>48.6***</td>
<td>42.6***</td>
<td>42.0***</td>
<td>38.7***</td>
</tr>
<tr>
<td>Male gender, %</td>
<td>42.1</td>
<td>41.6</td>
<td>44.8</td>
<td>48.4*</td>
<td>40.8</td>
<td>40.0</td>
<td>47.4</td>
</tr>
<tr>
<td>Living alone, %</td>
<td>31.8</td>
<td>44.7***</td>
<td>32.1</td>
<td>40.4***</td>
<td>16.8***</td>
<td>47.9***</td>
<td>22.6</td>
</tr>
<tr>
<td>Paid work, %</td>
<td>22.6</td>
<td>22.2</td>
<td>15.6**</td>
<td>14.5</td>
<td>23.4</td>
<td>27.8</td>
<td>13.3***</td>
</tr>
<tr>
<td>Poor/very poor self-reported mental health status, %</td>
<td>25.0</td>
<td>21.7</td>
<td>27.5</td>
<td>23.5</td>
<td>28.0</td>
<td>22.8</td>
<td>21.7</td>
</tr>
<tr>
<td>Admitted at least once in past year for mental health reasons, %</td>
<td>22.5</td>
<td>16.9</td>
<td>26.0</td>
<td>18.9</td>
<td>25.7</td>
<td>19.3</td>
<td>25.5</td>
</tr>
<tr>
<td>Detained at least once in past year, %</td>
<td>7.0</td>
<td>6.2</td>
<td>10.1*</td>
<td>7.1</td>
<td>11.3***</td>
<td>8.9</td>
<td>11.3**</td>
</tr>
<tr>
<td>On enhanced CPA</td>
<td>37.4</td>
<td>33.5</td>
<td>42.1</td>
<td>33.7</td>
<td>32.5*</td>
<td>30.6</td>
<td>48.7***</td>
</tr>
</tbody>
</table>

CPA, care programme approach.
*P < 0.05, **P < 0.01; ***P < 0.001 v White British group.

### Table 3: Mean patient experience scores from 2004 survey according to ethnic group

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Overall mean</th>
<th>Access</th>
<th>Coordination</th>
<th>Information</th>
<th>Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>White British</td>
<td>73.4</td>
<td>70.6</td>
<td>75.1</td>
<td>70.3</td>
<td>82.0</td>
</tr>
<tr>
<td>White Irish</td>
<td>74.3</td>
<td>71.6</td>
<td>75.5</td>
<td>71.2</td>
<td>83.2</td>
</tr>
<tr>
<td>White Other</td>
<td>71.7**</td>
<td>67.8**</td>
<td>74.7</td>
<td>66.9**</td>
<td>81.6</td>
</tr>
<tr>
<td>Mixed</td>
<td>72.8</td>
<td>68.7</td>
<td>75.3</td>
<td>70.1</td>
<td>82.8</td>
</tr>
<tr>
<td>Asian</td>
<td>72.8</td>
<td>69.4</td>
<td>77.9*</td>
<td>67.1**</td>
<td>82.5</td>
</tr>
<tr>
<td>Black</td>
<td>74.4</td>
<td>72.0</td>
<td>77.8*</td>
<td>68.3</td>
<td>84.6**</td>
</tr>
<tr>
<td>Other</td>
<td>71.8</td>
<td>63.8**</td>
<td>76.1</td>
<td>68.3</td>
<td>82.6</td>
</tr>
</tbody>
</table>

*P < 0.05, **P < 0.01 v the White British group.
1. Scores were predicted using the regression models for the baseline group (any age in years, male, excellent mental health, not living alone, not detained in past year, not admitted to hospital in past year, in paid work).
12 months or for being seen by the same psychiatrist at the last two appointments. Overall 57.9% of respondents said they had seen a community psychiatric nurse (CPN) in the previous 12 months. Compared with the White British group, a greater proportion of respondents from the Black group said they had seen a CPN. Just over half (55.3%) of respondents said they had also seen a health professional other than a psychiatrist or CPN in the past 12 months; the proportion was significantly lower in the Asian group than the White British group.

Overall, 92.6% of respondents said they had taken a medication for mental health problems in the past 12 months; no ethnic differences were observed after controlling for the independent variables. Overall, 40.6% of respondents said they had some form of talking therapy (e.g. counselling or psychotherapy) in the past 12 months. Compared with the White British group, significantly lower proportions of respondents from the Asian and Black groups said they had received any form of talking therapy in the past 12 months. However, overall, 42.6% of respondents said they did not want a talking therapy. Among those who said they did want a talking therapy, overall 65.7% said they had received it. The odds ratios for those receiving talking therapy among those who wanted it were below 1 for all minority ethnic groups except for the Other group. The results did not reach statistical significance but this could reflect sample sizes as most of the confidence intervals for the individual ethnic groups only just straddled 1.

Almost two-thirds (62.5%) of respondents said they had been told their care coordinator; significant proportions said they had not (27.6%) or they did not know (9.9%). Compared with White British respondents, the proportions that said they had been told their care coordinator were significantly lower among White Other and Asian respondents, and significantly higher among Black respondents. Over two-thirds (69.6%) of respondents said that it was less than 1 month since they had last seen their care coordinator, 19.0% said it was 1–3 months, with the remainder stating it was over 3 months. A higher proportion of the Asian and Other groups compared with the White British said they had last seen their care coordinator over 1 month ago.

When asked whether they had been given or offered a written or printed copy of their care plan, overall under half (44.9%) answered affirmatively, a similar proportion answered negatively (44.4%) and 10.7% said they did not know.

Table 4  Beta coefficients from multiple regression analysis of 2004 survey data

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall</th>
<th>Access</th>
<th>Coordination</th>
<th>Information</th>
<th>Relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>0.17***</td>
<td>0.15***</td>
<td>0.22***</td>
<td>0.09***</td>
<td>0.25***</td>
</tr>
<tr>
<td>Female gender</td>
<td>-0.02</td>
<td>-0.73*</td>
<td>-0.18</td>
<td>1.16**</td>
<td>-0.24</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Irish</td>
<td>0.90</td>
<td>1.01</td>
<td>0.41</td>
<td>0.90</td>
<td>1.18</td>
</tr>
<tr>
<td>White Other</td>
<td>-1.73*</td>
<td>-2.79**</td>
<td>-0.40</td>
<td>-3.38***</td>
<td>-0.32</td>
</tr>
<tr>
<td>Mixed</td>
<td>-0.55</td>
<td>-1.85</td>
<td>0.18</td>
<td>-0.26</td>
<td>0.80</td>
</tr>
<tr>
<td>Asian</td>
<td>-0.62</td>
<td>-1.14</td>
<td>2.81**</td>
<td>-3.19***</td>
<td>0.57</td>
</tr>
<tr>
<td>Black</td>
<td>1.05</td>
<td>1.44</td>
<td>2.76**</td>
<td>-1.98</td>
<td>2.62**</td>
</tr>
<tr>
<td>Other</td>
<td>-1.59</td>
<td>-6.80**</td>
<td>1.00</td>
<td>-1.99</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Self-reported mental health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very good</td>
<td>-0.87</td>
<td>-1.76*</td>
<td>-0.71</td>
<td>-0.77</td>
<td>0.12</td>
</tr>
<tr>
<td>Good</td>
<td>-3.96***</td>
<td>-4.66***</td>
<td>-2.78***</td>
<td>-4.65***</td>
<td>-2.77***</td>
</tr>
<tr>
<td>Fair</td>
<td>-8.79***</td>
<td>-8.53***</td>
<td>-6.78***</td>
<td>-10.47***</td>
<td>-6.99***</td>
</tr>
<tr>
<td>Poor</td>
<td>-14.49***</td>
<td>-13.11***</td>
<td>-11.98***</td>
<td>-17.42***</td>
<td>-12.79***</td>
</tr>
<tr>
<td>Very poor</td>
<td>-20.30***</td>
<td>-18.07***</td>
<td>-16.59***</td>
<td>-24.00***</td>
<td>-19.14***</td>
</tr>
<tr>
<td>Living alone</td>
<td>-2.01***</td>
<td>-0.56</td>
<td>-1.85**</td>
<td>-2.62**</td>
<td>-2.74**</td>
</tr>
<tr>
<td>Detained at least once in past year</td>
<td>-2.54***</td>
<td>-0.45</td>
<td>-2.73**</td>
<td>-3.88***</td>
<td>-3.27**</td>
</tr>
<tr>
<td>Hospital admissions in past year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>-0.37</td>
<td>2.37***</td>
<td>-3.13***</td>
<td>-1.62***</td>
<td>-2.08***</td>
</tr>
<tr>
<td>2-3</td>
<td>-1.59**</td>
<td>1.47</td>
<td>-4.72***</td>
<td>-2.47**</td>
<td>-4.32**</td>
</tr>
<tr>
<td>&gt;3</td>
<td>-1.92</td>
<td>-1.53</td>
<td>-1.61</td>
<td>-1.30</td>
<td>-5.46**</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not currently in paid work</td>
<td>-0.08</td>
<td>2.63***</td>
<td>-2.57***</td>
<td>-1.72***</td>
<td>-1.00**</td>
</tr>
<tr>
<td>Working casual or voluntary basis</td>
<td>-0.35</td>
<td>0.40</td>
<td>-3.12***</td>
<td>0.31</td>
<td>-1.73*</td>
</tr>
<tr>
<td>Full-time student</td>
<td>-1.25</td>
<td>-0.50</td>
<td>-2.63</td>
<td>-1.83</td>
<td>-1.40</td>
</tr>
<tr>
<td>Constant (unadjusted mean score)</td>
<td>73.39***</td>
<td>70.57***</td>
<td>75.08***</td>
<td>70.32***</td>
<td>81.97***</td>
</tr>
</tbody>
</table>

*P < 0.05, **P < 0.01, ***P < 0.001.
1. Coefficients using the regression models relative to the baseline group (male, White British, excellent mental health, not living alone, not detained in past year, not admitted to hospital in past year, in paid work).
2. For individual year of age.
said they had had a care review in the past 12 months; compared with the White British group, this proportion was lower among Asian respondents and higher among Black respondents.

When asked whether they had an out-of-hours number for the local NHS mental health service, 44.4% of respondents said yes, 46.5% said no and 9.1% said they were not sure or did not know. The proportions responding affirmatively were lower among Mixed and Asian respondents compared with White British respondents.

In summary, relative to the White British group, the main ethnic differences were for the Asian group, who responded negatively to several questions about access to community mental health services. No negative differences were apparent for the White Irish and Black groups. Respondents from the Black group were more likely than White British to say they had seen a CPN, had a care review in the preceding year and had been told their care coordinator. Overall, minority ethnic groups were less likely to have said they had received talking therapies in the past year.

Age, employment status, hospital admission, detention under the Mental Health Act 1983 and CPA status were stronger and more consistent predictors of responses than ethnicity. The strongest predictor was self-reported health status.

DISCUSSION

Ethnic differences in rates of mental illness, and access to and experience of mental health services, have been a focus of widespread and long-standing debate and concern in the UK. It is widely reported that Black and minority ethnic groups in England, especially African–Caribbeans, have adverse experiences of mental health services (Sainsbury Centre for Mental Health, 2002; Department of Health, 2003, 2005). Patient experience is increasingly recognised as being critical to service development and the provision of patient-centred care. However, there is a paucity of robust comparative research on the experiences of mental health service users, including those from Black and minority ethnic groups, as there have been few systematic, comparative studies with robust sample sizes.

Strengths

The Healthcare Commission has a national programme of patient experience surveys across NHS primary care, acute, mental health and ambulance trusts in England. The surveys provide direct feedback on patients’ experiences of NHS services, and are intended to inform improvements in the services provided by healthcare organisations. These are among the largest such surveys conducted internationally. They are designed to measure patients’ factual experience of health services rather than levels of satisfaction. Patient satisfaction can be influenced by predetermined expectations, gratitude bias and other factors (Sitzia & Wood, 1997; Crow et al, 2002), hence it is considered a less reliable marker of patient feedback and inter-group differences. However, questions about specific aspects of the healthcare actually experienced by patients provide more objective

Table 5  Fixed-effects logistic regression analysis of results from 2005 survey adjusting for confounding variables

<table>
<thead>
<tr>
<th>Outcome</th>
<th>White Irish</th>
<th>White Other</th>
<th>Mixed</th>
<th>Asian</th>
<th>Black</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>In contact with services &gt; 1 year</td>
<td>1.10 (0.76–1.6)</td>
<td>0.63 (0.49–0.81)</td>
<td>0.92 (0.65–1.32)</td>
<td>0.64 (0.50–0.80)</td>
<td>0.84 (0.62–1.14)</td>
<td>0.44 (0.27–0.72)</td>
</tr>
<tr>
<td>Seen a psychiatrist in past 12 months</td>
<td>1.44 (0.97–2.15)</td>
<td>0.99 (0.76–1.3)</td>
<td>0.97 (0.68–1.39)</td>
<td>0.81 (0.63–1.03)</td>
<td>0.98 (0.71–1.36)</td>
<td>2.73 (1.17–6.37)</td>
</tr>
<tr>
<td>Seen by same psychiatrist past 2 times</td>
<td>0.86 (0.65–1.16)</td>
<td>0.95 (0.74–1.23)</td>
<td>0.88 (0.64–1.20)</td>
<td>1.02 (0.83–1.26)</td>
<td>1.02 (0.80–1.30)</td>
<td>0.92 (0.57–1.48)</td>
</tr>
<tr>
<td>Seen CPN in past 12 months</td>
<td>1.06 (0.83–1.36)</td>
<td>0.85 (0.69–1.05)</td>
<td>1.14 (0.88–1.49)</td>
<td>1.04 (0.86–1.25)</td>
<td>1.60 (1.28–2.01)</td>
<td>0.99 (0.65–1.53)</td>
</tr>
<tr>
<td>Taken medication for mental health problems in past 12 months</td>
<td>0.93 (0.73–1.18)</td>
<td>1.02 (0.83–1.25)</td>
<td>1.06 (0.82–1.37)</td>
<td>0.82 (0.66–0.98)</td>
<td>0.91 (0.74–1.12)</td>
<td>0.96 (0.64–1.45)</td>
</tr>
<tr>
<td>Any talking therapy sessions from NHS in past 12 months</td>
<td>0.95 (0.58–1.54)</td>
<td>0.97 (0.69–1.36)</td>
<td>0.76 (0.50–1.17)</td>
<td>1.03 (0.72–1.45)</td>
<td>1.00 (0.66–1.51)</td>
<td>0.77 (0.39–1.53)</td>
</tr>
</tbody>
</table>

Results in bold are significant.

CPN, community psychiatric nurse; NHS, National Health Service.

1. Adjustment was made for age, gender, paid work status, self-reported health status, admission to hospital as a mental health patient, detention under the Mental Health Act 1983, care programme approach and trust of treatment.

2. Minority ethnic groups compared with the White British group.
and comparable measures of service quality. This approach is now used across the NHS.

The results presented here are based on surveys of all NHS providers of mental health services in England. Almost 27,400 users of community mental health services participated in the 2004 survey and 26,500 in the 2005 survey. About 10% (2,750 and 2,560 respectively) of the respondents were of Black and minority ethnic origin. These are uniquely large samples for analysing ethnic variations in the experiences of those using community mental health services.

These surveys have several strengths for analysing ethnic differences in the views of service users with long-term mental health needs. Postal surveys such as these are a cost-effective way of obtaining feedback from large numbers of service users, hence they offer the statistical power for measuring ethnic differences that smaller, qualitative or interview-based studies do not. The surveys focused on priorities for service users and were developed with user involvement. The data were collected directly from service users and are independent of potential external bias. Hence the surveys are considered to be reliable markers of patient experience, and are used in the Healthcare Commission’s assessments of NHS trusts and by the Department of Health for monitoring national progress on the Public Service Agreement target relating to patient experience.

Poor experience of mental health services among patients from Black and minority ethnic groups is widely reported, and undoubtedly this reflects the views expressed. However, systematic comparative research into ethnic variations in patient experience is scarce, based on small samples and shows mixed results. Bhugra et al (2004) reported that Black mental health patients tended to be more dissatisfied with general practitioner (GP) services than White patients. Parkman et al (1997) noted that African-Caribbean patients were less satisfied with secure services than White service users. Other studies have found small or no ethnic differences in satisfaction with care (McGovern & Hemmings, 1994; Leavie et al, 1997; Callan & Littlewood, 1998; Commander et al, 1999). Although there is a dearth of research on ethnic differences in experience of mental health services, a study of disengagement and engagement with services among assertive outreach patients showed no differences between African–Caribbean and White patients (Prieb e et al, 2005). The surveys analysed here had significantly larger samples and examined patient experience rather than satisfaction.

Limitations

There are some caveats to the findings. Although the analyses controlled for mental health status, hospital admissions and detention status as proxies for case mix, these variables may not fully control for diagnostic differences (e.g. depression, psychotic illness), which can affect the way patients respond (Fakhouri et al, 2002). This might be reflected in the significantly lower rates of self-reported poor/very poor mental health status among the Black group compared with other ethnic groups in both surveys. It is also not possible to say whether or not the level of functioning affected patient responses.

The overall response rates to the surveys of about 40% are lower than those for the other Healthcare Commission surveys. However, we are not aware of other surveys published in the UK that have achieved a higher response rate from mental health service users sampled from CPA registers, or similar sampling frames of people with relatively serious mental illness. A comparative study in Switzerland of surveys of mental health patients discharged from hospital had response rates that were only moderately higher, in the range of 43–50% (Peytremann-Bridevaux et al, 2006). It was not possible to derive accurate response rates by ethnic group, as ethnicity coding in the trusts’ samples was significantly incomplete. The partial information available indicated that response rates were lower in respondents from minority ethnic groups than the White British group. This would be significant only if there is an additional systematic non-response bias. However, it is not possible to say whether there is such a bias, or in which direction it might operate. Moreover, similar ethnic differences in response rates are indicated in the Healthcare Commission’s surveys of patients in other sectors (e.g. in-patients and out-patients in acute trusts, accident and emergency, ambulance service users, primary care), where we have reported more marked ethnic differences in patient experience than those observed here for mental health service users (Commission for Health Improvement, 2004; Healthcare Commission, 2005a, 2006). Response rates among Black and minority ethnic groups tend to be lower than among the White British population across most national surveys (McManus et al, 2006). However, in the absence of alternatives, this does not stop survey findings being used widely. Lower response rates among minority ethnic groups are in part attributable to the fact that response rates to surveys are generally lower among younger people, deprived groups, and those living in London and other inner-city areas, characteristics that apply particularly to minority ethnic groups. So, the apparent lower response rates from Black and minority ethnic groups will in part be due to artefactual demographic reasons. For instance, in the 2005 survey, overall response rates at ages 16–25, 26–33, 36–50, 51–64 years were 30, 33, 40 and 48% respectively.

Furthermore, indications that the sample is broadly representative are that the proportion of respondents from minority ethnic groups (10%) broadly reflects the proportion in the general population, and that ethnic differences in patient characteristics reflect other research evidence (Morgan et al, 2005a,b) such as the proportions in employment, living alone or having had a hospital admission or detention under the Mental Health Act 1983. For these reasons, we consider response bias is unlikely to affect the results significantly.

Differences in therapy

Patients from minority ethnic groups are frequently cited as being more likely than White patients to be prescribed drugs and electroconvulsive therapy rather than talking treatments such as psychotherapy and counselling. One study showed that people of Caribbean origin with psychosis were less likely to receive psychotherapy and be treated for depression (McKenzie et al, 2001). However, there is limited evidence on these issues. Effective community care could reduce the need for acute secondary care, but research on the use of community mental health services and therapies by ethnicity is particularly sparse.

Our analysis of the 2005 survey showed few or no differences relative to White British patients in terms of the proportions of patients from minority ethnic groups who saw a mental health professional in the past 12 months or those on medication. Although this study is limited to users of community mental health services, this is an important finding, since minority ethnic groups are widely reported as being more
likely to receive medication (Sainsbury Centre for Mental Health, 2002; Department of Health, 2003, 2005). Our results relating to access to talking therapies (among respondents who said they wanted such therapies) narrowly failed to reach statistical significance for the individual minority ethnic groups; however, the odds ratios for most groups were low, indicating that ethnicity may be associated with a lower likelihood of receiving talking therapies.

Differences among groups
Where negative experiences were apparent, they applied in the main to the Asian group, who were more likely than the White British to say they had not received some services (2005 survey). Asian (and White Other) respondents also showed some negative differences from the White British group in the analysis of domains of patient experience, although not consistently (2004 survey). Whereas much of the published literature focuses on issues relating to African–Caribbean patients with mental illness, these findings clearly indicate the need for improvements in the care provided for Asian service users. Asian groups also report less favourably than White British patients in a range of other patient experience surveys (Commission for Health Improvement, 2004; Healthcare Commission, 2005a, 2006).

In contrast, patient experience scores for the Black group showed few differences from the White group, and in some cases were higher. No differences in access to mental health professionals or medication were observed for the Black group, other than a higher rate of CPN contact. Compared with White British counterparts, they were also more likely to say they knew their care coordinator and to have had an annual care review. These findings suggest that where Black groups of patients are in contact with community services, their self-reported experience is not very different from (and in some cases better than) that of White British patients. Based on a community sample, our findings are not dissimilar to some other studies and do not support the widely held view of adverse experiences of mental health services among Black groups.

These findings in relation to Black groups are encouraging and could reflect growing awareness and institutional changes towards more culturally sensitive services (Mclean et al, 2003). There may also be other explanations. McGovern & Hemmings (1994) suggest other factors might be responsible for a lack of Black–White difference in satisfaction with services; for example, that, for Black patients, White patients may not be the reference group for comparing quality of care. Diagnostic differences could play a role (Fakhoury et al, 2002); for example, patients with depression might respond differently to those with psychotic illness. Compared with patients with major depression and anxiety disorders, self-rated health and life satisfaction are better in patients with schizophrenia (Koivumaa-Honkanen et al, 1999). This may explain why Black groups, who are reported to have a higher prevalence of psychotic illness, had a lower proportion reporting poor very poor mental health status in these surveys.

Other factors
We found that age, living alone, detention under the Mental Health Act 1983, CPA status and hospital admission were stronger and more consistent predictors of patient experience than ethnicity. Of all the independent variables examined, self-reported mental health status had the strongest explanatory effect, consistent with the findings of other studies (Hargreaves et al, 2001; Ren et al, 2001). Reviews of patient satisfaction surveys have similarly shown a positive association of patient satisfaction with increasing age and better health status (Sitzia & Wood, 1997; Crow et al, 2002). These findings suggest that factors associated with ethnicity, rather than ethnicity per se, are stronger determinants of patient experience. However, ethnicity does have an independent residual effect, and our findings show that improvements are needed in mental health services provided to minority ethnic groups, including better access to talking therapies.

Ethnicity coding
One of the aims of the ‘Count Me In’ censuses of 2005 and 2006 was to improve organisational recording of self-reported ethnic status and to provide a baseline for ethnic monitoring (Healthcare Commission et al, 2005, 2007). Our study shows that ethnicity recording in trust records is significantly incomplete and needs to be improved to support ongoing and effective ethnic monitoring, and adherence to the Race Relations Amendment Act 2000.

ACKNOWLEDGEMENTS
These surveys were funded by the Department of Health and coordinated on behalf of the Healthcare Commission by the Picker Institute Europe. We are grateful to the service users and NHS trusts who participated. The views expressed are those of the authors.
APPENDIX A

2004 survey of users of community mental health services: questions used to construct patient experience domain scores

Access and waiting
D1. In the last 12 months have you had any talking therapy (e.g. counselling) from NHS mental health services?
E10. Can you contact your care coordinator if you have a problem?
F9. In the last 12 months, have any appointments been cancelled or changed by mental health services?
G1. Do you have the number of someone in mental health services that you can call out of office hours?

Safe, high-quality, coordinated care
B3. Did you have trust and confidence in the psychiatrist you saw?
B6. The last 2 times you had an appointment with a psychiatrist was it with the same psychiatrist both times or with two different psychiatrists?
B9. Did you have trust and confidence in the CPN?
E7. Did you find the care review helpful?

Better information, more choice
C2. Do you have a say in decisions about the medication you take?
E5. Were you told that you could bring a friend or relative to your care review meetings?
E6. Were you given a chance to express your views at the care review meeting?
F7. In the last 12 months have you received any information about local support groups for mental health service users?
J3. Do you have enough say in decisions about your care and treatment?
J3. Has your diagnosis been discussed with you?

Building relationships
B2. Did the psychiatrist listen carefully to you?
B4. Did the psychiatrist treat you with respect and dignity?
B5. When you last saw a psychiatrist, were you given enough time to discuss your condition and treatment?
B8. Did the CPN listen carefully to you?
B10. Did the CPN treat you with respect and dignity?

REFERENCES


Social Science and Medicine, 58, 739–752.


Incidence and predictors of mental ill-health in adults with intellectual disabilities

Prospective study


Background The point prevalence of mental ill-health among adults with intellectual disabilities is 40.9%, but its incidence is unknown.

Aims To determine the incidence and possible predictors of mental ill-health.

Method Prospective cohort study to measure mental ill-health in adults with mild to profound intellectual disabilities.

Results Cohort retention was 70% (n=465). The 2-year incidence of mental ill-health was 16.3% (12.6% excluding problem behaviours, and 4.6% for problem behaviours) and the standardised incidence ratio was 1.87 (95% CI 1.51–2.28). Factors related to incident mental ill-health have some similarities with those in the general population, but also important differences. Type of accommodation and support, previous mental ill-health, urinary incontinence, not having impaired mobility, more severe intellectual disabilities, adult abuse, parental divorce in childhood and preceding life events predicted incident ill-health; however, deprivation, other childhood abuse or adversity, daytime occupation, and marital and smoking status did not.

Conclusions This is a first step towards intervention trials, and identifying sub-populations for more proactive measures. Public health strategy and policy that is appropriate for this population should be developed.

Declaration of interest None. Funding detailed in Acknowledgements.

Intellectual disabilities are common and lifelong. For the USA 2000 birth cohort, it is estimated that the lifetime costs of intellectual disabilities will be $44.1 billion in excess of costs for people without intellectual disabilities (Honeycutt et al., 2003). The point prevalence of mental ill-health has been reported as 40.9% (Cooper et al., 2007), which is higher than that of the general population, and is a significant contributor to both costs and quality of life. The factors associated with mental ill-health differ from findings in the general population (Cooper et al., 2007). Prevalence of mental ill-health is determined by the incidence of episodes of mental ill-health and by the duration of episodes, and the factors predicting incidence and duration may differ. Associations found in cross-sectional studies cannot distinguish between factors predicting incidence, predicting duration, or both. Some associations may be the consequences of mental ill-health. The incidence rate and predictors of incident mental ill-health in this population are unknown (Smiley, 2005). Previous longitudinal studies in the general population did not include people with moderate to profound intellectual disabilities, but did demonstrate the higher prevalence of symptoms of depression and anxiety in adults with mild intellectual disabilities compared with the general population (Maughan et al., 1999; Richards et al., 2001). They did not determine the factors predicting depression/anxiety scale scores, in view of the small numbers with mild intellectual disabilities (n=100 and n=41 in the respective studies) and low rates of (and bias in) cohort retention. The prevalence of problem behaviours was assessed in an institutional cohort of 67 adults with severe to profound intellectual disabilities at time points 16–18 years apart (Reid & Ballinger, 1995). They reported a correlation in problem behaviour prevalence at the two time points: the presented data indicated some movement into and out of the problem behaviour category, but details were not reported and predictors were not investigated.

The specific aims of our study were to determine the incidence of mental ill-health among adults with mild to profound intellectual disabilities, and investigate factors hypothesised to be related to incident mental ill-health. We are not aware of any such previous investigation.

METHOD

Participants

The adult intellectual disabilities population (aged 16 years and over) in Greater Glasgow, UK, was identified. The process identified all adults with intellectual disabilities who were registered with a general practitioner (family physician) in Greater Glasgow (all 631 of these doctors contributed to the ascertainment process); adults who were receiving support of any type paid for, or provided by, the social work department, including day services and support packages of any size; and adults using specialist intellectual disabilities health services. Hence, this included both adults who had spent all their lives in the community (82.4%) and adults who had previously spent some of their life in long-stay hospital accommodation (17.6%). At the time of the study, all long-stay hospital accommodation in the area had been closed. The rate of intellectual disabilities in adulthood was 3.33 per 1000 general population, which is comparable with ascertainment rates for the adult population with intellectual disabilities conducted elsewhere (Farmer et al., 1993; McGrother et al., 2001; van Schrojenstein Lantman de-Valk et al., 2006). Adults were recruited into a longitudinal cohort at the first time point (time 1) (Cooper et al., 2007); measurements were repeated 2 years later (time 2).

Approval and consent

Ethics committee approval was gained. Consent was taken from each participant with capacity to decide to consent, or otherwise from their nearest relative, in keeping with the Adults with Incapacity (Scotland) Act.

Data collection process

Face-to-face interviews were completed with each person supported by their carer.
Information was also collected from a relative. At both time 1 and time 2, following each interview, health data were discussed with a doctor. Individuals who had two or more symptoms, or one ‘high-risk’ symptom, at the interview on the Psychiatric Assessment Schedule for Adults with Developmental Disability (PAS–ADD) Checklist (Moss et al, 1998) each had a second face-to-face comprehensive psychiatric assessment conducted by the Glasgow University Centre for Excellence in Developmental Disabilities (UCEDD), which is run by two academics who are also qualified consultant psychiatrists specialising in working with adults with intellectual disabilities. In 67.8% of cases, one of the consultants collected the assessment information; in 32.2% of cases a non-consultant specialist psychiatrist conducted the assessment (81.3% of which were conducted by a specialist registrar who had passed the membership of the Royal College of Psychiatrists examinations and was in her final year of training to be eligible for consultant posts in intellectual disabilities psychiatry), rather than a consultant. In all cases the findings were case-conferenced by the consultant members of the research team to derive consultant-level diagnoses. At time 2, in addition, any episodes of mental ill-health that occurred between time 1 and time 2 were identified at the face-to-face interview by a series of semi-structured questions, and the PAS–ADD Checklist was completed for that episode at the interview with the person, supported by a carer. The same thresholds were used to identify people for the second face-to-face comprehensive psychiatric assessment by the UCEDD. Participants requiring diagnostic clarification of problem behaviours also received a comprehensive psychiatric assessment by the UCEDD, as did those who scored on items of mental ill-health on the C21st Health Check (Glasgow University Centre for Excellence in Developmental Disabilities, 2001). Medical and psychological case-notes were reviewed for all participants. Episodes of mental ill-health were classified according to the psychiatrists’ clinical opinion, the Diagnostic Criteria for Psychiatric Disorders for Use with Adults with Learning Disabilities/Mental Retardation (DC–LD; Royal College of Psychiatrists, 2001), the ICD–10 Diagnostic Criteria for Research (ICD–10–DCR; World Health Organization, 1993) and the revised DSM–IV (DSM–IV–TR; American Psychiatric Association, 2000) diagnostic criteria.

**Instruments**

The same instruments were used at both the time 1 and time 2 interviews.

**PAS–ADD Checklist**

The PAS–ADD Checklist is a screening tool for mental ill-health designed for use with adults with intellectual disabilities (Moss et al, 1998). However, when using the published threshold scores (which are 6 and above for the affective or neurotic disorder sub-scale, 5 and above for the possible organic condition sub-scale and 2 and above for the psychotic disorder sub-scale), the reported sensitivity of this tool is only about 66% (Moss et al, 1998; Simpson, 1999; Sturme y et al, 2005). Simpson’s extremely detailed study of the psychometric properties of the tool included receiver operating characteristic analyses for various possible ways of completing the PAS–ADD Checklist. These were completing it with the person’s main carer, with two carers, or with day-centre staff, and for each of these scoring the PAS–ADD Checklist by counting items using the Likert scale, any positive item or a mid-point threshold for each item (i.e. a score of 2 or 3). This found that when the PAS–ADD Checklist was completed with the person’s main carer and a threshold of any two positive items was used, the tool had a 100% sensitivity to detect people meeting criteria for an ICD–10 diagnosis with a false-positive rate of 58%, and 95% sensitivity to detect people meeting criteria for a DSM–IV diagnosis with a false-positive rate of 53%. As would be expected, both sensitivity and false-positive rate progressively reduced with increasing threshold score (Simpson, 1999). We wanted to maximise the detection of true positives, at the cost of false positives at this first stage of the process, as the two-stage process would mean that any false positives at stage 1 would be detected at stage 2 (the comprehensive psychiatric examination). Consequently we used the threshold of any two positive items across the whole scale, to trigger the second-stage full psychiatric assessment. Additionally, we used a threshold of only needing only one positive item if it was attempted suicide or talk of suicide, or any of the four psychosis items. We also added six new items after a pilot study with 50 persons. These were aimed at detecting mania and strengthening the psychosis sub-scale, and were specifically liability of mood; loss of social inhibitions/onset of inappropriate social behaviour; increased interest in sex/sexual indiscretions; excessive talking, laughing or singing; tearfulness; and thinking that people or the television are referring to the person or giving messages or instructions.

**Demographic questionnaire**

A semi-structured demography and supports questionnaire was designed specifically for the study, including postcode data to allocate individuals to quintiles of the Carstairs Deprivation Index, a Scottish area-based measure of socio-economic deprivation (Carstairs & Morris, 1989).

**Personal history questionnaire**

A purpose-designed semi-structured past and personal history questionnaire was used to collect these data.

**Vineland Scale**

The Vineland Scale (Survey Form) (Sparrow et al, 1984) was used to measure ability and skills.

**C21st Health Check**

Selections from the C21st Health Check were used, including problem behaviours, and mental ill-health items that identified participants requiring full psychiatric assessment even if they scored below the lowered threshold on the PAS–ADD Checklist.

**Psychiatric assessment**

Psychiatrist assessment followed a comprehensive semi-structured assessment format, which included using the Present Psychiatric State for Adults with Learning Disabilities (PPS–LD; Cooper, 1997). This semi-structured schedule for use with adults with intellectual disabilities measures the comprehensive range of psychopathology required for classification by clinical, DC–LD, ICD–10–DCR and DSM–IV–TR criteria.

**Physical health**

At time 1 physical health was comprehensively measured using the full C21st Health Check, which includes measurement of vision and hearing.
Statistical analyses

Data were analysed using the Statistical Package for the Social Sciences version 11.5 for Windows. Potential bias among potential participants for whom consent was refused was examined, with regards to age, gender, level of ability, type of accommodation and support, and prevalence of mental ill-health at time 1. The 2-year incidence rate of mental ill-health was defined as the proportion of individuals with the onset of a new episode at any time in the 2-year period. For the common mental disorders, the standardised incidence ratio and 95% confidence interval were then calculated using published general population data. Two subgroups of incident outcomes were further investigated: incident episodes of mental ill-health (excluding problem behaviours, dementia and delirium), and incident episodes of problem behaviours. Dementia and delirium were excluded as their aetiology was postulated to differ from that of other types of mental ill-health. Problem behaviours were analysed separately because of ongoing debate regarding their nosological status, and because of comorbidity of problem behaviours and other types of mental ill-health, e.g. enduring problem behaviours plus incidence of depressive episode.

Multivariate logistic regression modeling was undertaken to assess potential risk factors for predicting which individuals would experience at least one incident episode of mental ill-health in the two subgroups defined above during the 2-year follow-up period. Four groups of factors (26 factors in total) were investigated for each of the outcomes:

(a) personal factors (six items): older age; female gender; more severe intellectual disabilities; Down syndrome; mental ill-health in the past; mental ill-health within a biological family member;

(b) past experiences (six items): death of parent/parental figure before age 19 years; divorce of parents before age 19 years; raised outside a family home before age 19 years; other adversity before age 19 years (compulsory removal from the family home, known abuse, neglect or exploitation, financial poverty, other traumatic experiences); known adult abuse, neglect or exploitation; previous long-stay hospital residence during adulthood;

(c) lifestyle and supports measured at time 1 (six items): type of accommodation/support (not living with a family carer; having no employment/day opportunities; Carstairs quintile (living in more deprived areas); single status; smoking; experiencing preceding life events;

(d) health and disabilities measured at time 1 (eight items): visual impairment; hearing impairment; bowel incontinence; urinary incontinence; impaired mobility; severe physical disabilities; epilepsy; special communication needs.

We conducted the analysis of each endpoint in discrete stages. Initially, the distribution of the outcomes of interest and each factor was assessed individually. Second, for each of the four subgroups of factors described above, a backwards stepwise method was used to determine the set of factors within the subgroup that were independently related to the outcome. Finally, the independently related factors from these four group-specific models were entered into a single global model and a backward stepwise method was again used to reach the final model for that outcome. Likelihood ratio tests were used in the stepwise procedures to determine statistical significance for removal of each factor (the removal criterion was set at 0.05). The two final models were checked for goodness of fit using the Hosmer–Lemeshow test, in which the study sample is divided into deciles of predicted risk and the numbers of observed and expected events compared using a $\chi^2$-test. Because of the small numbers of expected events in some deciles of predicted risk, the lowest risk groups were combined until the expected number of events exceeded 3 in all groups.

RESULTS

Cohort at time 2

At time 1 the cohort size was 1202. At time 2 the potential cohort size was 936, because of 54 deaths, 184 no longer satisfying the new requirements of the Adults with Incapacity (Scotland) Act for inclusion in research (through not having a nearest relative owing to death or loss of contact with family, or a welfare guardian) and 28 due to other circumstances such as serious physical ill-health. All 936 were in-cluded and held a single or shared tenancy agreement; 69 (10.6%) lived in a congregate care setting. Regarding daytime opportunities and occupation, 147 (22.6%) had none, of whom 24 were of retirement age (65 years or over).

Incidence of mental ill-health

Table 2 reports incidence by diagnostic groups and total incidence by person rather than by episode (some people had more than one episode). Some people had incident episodes in two different diagnostic groupings, in which case both are included in the relevant diagnostic grouping (but the total incidence remains reported by person rather than by episode). The names of diagnostic groupings differ in the different diagnostic manuals (e.g. ‘schizophrenia, schizotypal and delusional disorders’ in ICD–10–DCR but ‘non-affective psychotic disorders’ in DC–LD), but the operationally defined criteria within each manual have been strictly applied. The specific code numbers in each diagnostic grouping for each manual have been reported previously (Cooper et al., 2007).

The 2-year incidence rate for mental ill-health of any type was 16.3% (106 individuals); 82 individuals (12.6%) had an incident episode of mental ill-health excluding problem behaviours, of whom 74 (11.4%) had an incident episode of mental ill-health excluding problem behaviours, dementia
Table 1  Comparison of data collected at time 1 between participants at time 2 and those for whom consent to participate at time 2 was not gained

<table>
<thead>
<tr>
<th>Diagnostic criteria</th>
<th>Participants (n=651)</th>
<th>Non-participants (n=285)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years: mean (s.d.)</td>
<td>43.6 (14.2)</td>
<td>43.9 (14.4)</td>
<td>0.764</td>
</tr>
<tr>
<td>Gender, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>355 (54.5)</td>
<td>156 (54.8)</td>
<td>0.953</td>
</tr>
<tr>
<td>Female</td>
<td>296 (45.5)</td>
<td>129 (45.2)</td>
<td></td>
</tr>
<tr>
<td>Type of living/support arrangement at time 1, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family carer</td>
<td>258 (39.7)</td>
<td>113 (39.6)</td>
<td>0.673</td>
</tr>
<tr>
<td>Independent of support</td>
<td>51 (7.8)</td>
<td>28 (9.8)</td>
<td></td>
</tr>
<tr>
<td>With paid carer support</td>
<td>297 (45.7)</td>
<td>122 (42.8)</td>
<td></td>
</tr>
<tr>
<td>Congregate care setting</td>
<td>44 (6.8)</td>
<td>22 (7.7)</td>
<td></td>
</tr>
<tr>
<td>Ability, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild intellectual disabilities</td>
<td>254 (39.0)</td>
<td>118 (41.4)</td>
<td>0.127</td>
</tr>
<tr>
<td>Moderate intellectual disabilities</td>
<td>140 (21.5)</td>
<td>73 (25.6)</td>
<td></td>
</tr>
<tr>
<td>Severe intellectual disabilities</td>
<td>126 (19.4)</td>
<td>53 (18.6)</td>
<td></td>
</tr>
<tr>
<td>Profound intellectual disabilities</td>
<td>131 (20.1)</td>
<td>41 (14.4)</td>
<td></td>
</tr>
<tr>
<td>Prevalence of mental ill-health at time 1, n (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Including problem behaviours and autism</td>
<td>243 (37.3)</td>
<td>103 (36.1)</td>
<td>0.729</td>
</tr>
<tr>
<td>Excluding problem behaviours, including autism</td>
<td>170 (26.1)</td>
<td>74 (26.0)</td>
<td>0.962</td>
</tr>
<tr>
<td>Excluding problem behaviours and autism</td>
<td>136 (20.9)</td>
<td>56 (19.6)</td>
<td>0.665</td>
</tr>
</tbody>
</table>

1. Excludes specific phobias.

Table 2  Two-year incidence of mental ill-health by clinical, DC–LD, DCR–ICD–10 and DSM–IV–TR diagnostic criteria

<table>
<thead>
<tr>
<th>Diagnostic criteria</th>
<th>Clinical (n)</th>
<th>DC–LD (n)</th>
<th>DCR–ICD–10 (n)</th>
<th>DSM–IV–TR (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychotic disorder¹</td>
<td>9 (1.4)</td>
<td>9 (1.4)</td>
<td>6 (0.9)</td>
<td>8 (1.2)</td>
</tr>
<tr>
<td>Affective disorder</td>
<td>54 (8.3)</td>
<td>50 (7.7)</td>
<td>33 (5.1)</td>
<td>23 (3.5)</td>
</tr>
<tr>
<td>Anxiety disorder²</td>
<td>11 (1.7)</td>
<td>10 (1.5)</td>
<td>10 (1.5)</td>
<td>6 (0.9)</td>
</tr>
<tr>
<td>Obsessive–compulsive disorder</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Organic disorder</td>
<td>10 (1.5)</td>
<td>8 (1.2)</td>
<td>7 (1.1)</td>
<td>7 (1.1)</td>
</tr>
<tr>
<td>Alcohol/substance use disorder</td>
<td>2 (0.3)</td>
<td>2 (0.3)</td>
<td>2 (0.3)</td>
<td>2 (0.3)</td>
</tr>
<tr>
<td>Pica</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Eating disorder³</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
</tr>
<tr>
<td>Sleep disorder</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Problem behaviour</td>
<td>30 (4.6)</td>
<td>23 (3.5)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other mental ill-health</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>1 (0.2)</td>
<td>0</td>
</tr>
<tr>
<td>Mental ill-health of any type (excluding problem behaviour)³</td>
<td>82 (12.6)</td>
<td>77 (11.8)</td>
<td>55 (8.4)</td>
<td>44 (6.8)</td>
</tr>
<tr>
<td>Mental ill-health of any type (excluding organic disorder)³</td>
<td>98 (15.1)</td>
<td>89 (13.7)</td>
<td>49 (7.5)</td>
<td>38 (5.8)</td>
</tr>
<tr>
<td>Mental ill-health of any type (excluding problem behaviours and organic disorders)³</td>
<td>74 (11.4)</td>
<td>70 (10.8)</td>
<td>49 (7.5)</td>
<td>38 (5.8)</td>
</tr>
<tr>
<td>Mental ill-health of any type³</td>
<td>106 (16.3)</td>
<td>96 (14.7)</td>
<td>55 (8.4)</td>
<td>44 (6.8)</td>
</tr>
</tbody>
</table>

1. Includes schizoaffective disorders.
2. Excludes specific phobias.
3. Excludes pica.

and delirium; and 30 (4.6%) had an incident episode of problem behaviours. This rate is higher than that reported for the UK general population. Singleton & Lewis (2003) reported general population data on the incidence of common mental disorders. They used a sampling strategy to select 3536 persons from an original cohort of 8580 adults in England, Wales and Scotland to be reassessed 18 months after the initial assessments. Of the 3536 persons selected they were able to contact 3045, of whom assessments were completed with 2413. From the findings of that survey we would expect 8% of our cohort to have incident episodes of common mental disorders, i.e. 52 persons. Ninety-seven persons in the cohort had incident episodes that could be termed common mental disorders. The standardised incident ratio is therefore 1.87 (95% CI 1.51–2.28).

For mental ill-health of any type, the number of incident episodes per person was none for 545 (83.7%), one for 93 (14.3%), two for 11 (1.7%), three for 1 (0.2%) and four for 1 (0.2%). For 49 (46.2%) of the 106 participants with incident mental ill-health, the episode of mental ill-health had both incidence and recovery within the 2-year period; 57 had incidence and were still in episode at time 2.

Factors related to incidence of mental ill-health

The results from the initial univariate analyses, exploring the relationship of each individual variable of interest with the two outcomes, are shown in a data supplement to the online version of this paper. For incident episodes of mental ill-health (excluding problem behaviours, dementia and delirium) at the second stage of analyses (the group-specific models), 1 participant had an incomplete data-set (but did not have incident mental ill-health) for personal factors; there was no incomplete data-set for past experiences; 3 participants had incomplete data-sets for lifestyle/supports, none of whom had incident mental ill-health; and 16 had incomplete data-sets for health/disabilities, of whom 1 had incident mental ill-health. At the third stage of analyses (the global model) 1 participant had an incomplete dataset, but did not have an incident episode. Table 3 displays the results. For the global model the Hosmer–Lemeshow statistic was $\chi^2 = 1.86$, d.f. = 6, $P = 0.93$, giving no indication of lack of fit.

For incident episodes of problem behaviours at the second stage of analyses (the
Table 3  Factors independently related to incidence of mental ill-health and problem behaviours

<table>
<thead>
<tr>
<th>Incident mental ill-health (excluding problem behaviour, dementia and delirium)</th>
<th>Incident problem behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-specific models</td>
<td>Global model</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>P</td>
</tr>
</tbody>
</table>

**Group 1: Personal factors**

- Ability (v. mild intellectual disability)
  - Moderate intellectual disability: 1.84 (0.98–3.42), 2.24 (1.15–4.39)
  - Severe intellectual disability: 1.03 (0.51–2.10), 0.047
  - Profound intellectual disability: 0.61 (0.27–1.37), 0.73 (0.29–1.88)
  - Down syndrome: 0.47 (0.22–0.98), 0.031

**Group 2: Past experiences**

- Divorce of parents in childhood: 3.40 (1.97–5.86), <0.001
- Abuse/adversity in adulthood: 2.18 (1.14–4.21), 0.026
- Former long-stay hospital resident: 0.47 (0.22–0.98), 0.031

**Group 3: Lifestyle and supports**

- Accommodation/support (v. family carer)
  - Independent: 4.13 (1.66–10.30), 4.19 (1.57–11.14)
  - Paid carer: 3.13 (1.66–5.89), <0.001
  - Congregate: 3.91 (1.52–10.07), 3.38 (1.24–9.26)

- Life events in previous 12 months: 1.42 (1.07–1.88), 0.022

**Group 4: Health and disabilities**

- Urinary incontinence: 2.19 (1.26–3.78), 0.006
- Impaired mobility: 0.27 (0.12–0.60), <0.001

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1. For analysis of incident problem behaviour, smaller numbers of events required the combination of the ‘moderate’, ‘severe’ and ‘profound’ intellectual disability groups (odds ratios expressed relative to mild intellectual disability group) and the ‘independent of care’, ‘paid carer’ and ‘congregate care’ groups (OR expressed relative to family carer group).

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Discussion

The high point prevalence of mental ill-health for adults with intellectual disabilities is accounted for by both incident cases and enduring episodes, with slightly more enduring than incident cases, particularly with regard to problem behaviours. Incidence is statistically significantly higher than that reported in the general population.

Some of the associations we found with incident mental ill-health are immutable, e.g. ability level. These may help identify high-risk groups within the population, who may warrant provision of early interventions and supports. Other factors may be amenable to interventions, e.g. urinary incontinence and not having immobility. Incontinence may be aetiological through a mediating effect of self-esteem, or alternatively a common underlying mechanism. This interaction between mental ill-health and incontinence has also been identified within the general population (Perry et al., 2006). People who lack mobility might have a greater level of individual care or personal interaction which has coincidental benefits for mental health, or limited mobility might preclude circumstances and experiences that might be adversive to others; and 16 had incomplete data-sets for personal factors; there was no incomplete data-set for any of the groups, but did not have incident problem behaviours. Type of accommodation/support was dichotomised to living with a family carer or not; and ability level was dichotomised to mild intellectual disabilities or moderate–profound intellectual disabilities, in view of numbers being too small to sub-categorise further. At the third stage of analyses (the global model) 3 participants had incomplete data-sets, none of whom had an incident episode. Table 3 displays the results. For the global model the Hosmer–Lemeshow statistic was $\chi^2=1.11$, d.f. 3, $P=0.77$, again giving no indication of inadequate fit.

In summary, factors at time 1 that were related to an incident episode of mental ill-health (excluding problem behaviours, dementia and delirium) being identified at time 2 were living in a congregate care setting, with paid carer support, or independently of care (i.e. not living with a family carer); urinary incontinence; not having impaired mobility; having a past psychiatric history; moderate rather than mild intellectual disabilities; and the experience of abuse, neglect or exploitation during adult life. Not living with a family carer was also related to incident episodes of problem behaviours, but other factors differed and included lower ability level, having experienced the divorce of parents in childhood, and a higher number of life events in the preceding 12-month period.
mental health. This is the converse of findings in the general population (Singleton & Lewis, 2003).

The type of accommodation and support the participant received at time 1 was related to incidence of mental ill-health, with individuals in settings other than family homes at higher risk. We do not know the reason why participants were living within a particular type of accommodation/support, but note that past psychiatric history and type of accommodation/support were independently predictive. This warrants further research attention, and engagement between professionals, service managers and paid carers.

We found adverse events (preceding life events, parental divorce in childhood, and adult abuse, neglect and exploitation) to be related to incident episodes. This suggests the need for greater support for individuals at the time of experiencing such adversities, and further research and development of clinical practice to determine ways and formats in which such support could be provided. We hope that our findings will help to raise awareness of the impact of such events on people with intellectual disabilities, and that the onset of problem behaviours (not only other types of mental ill-health) may have an emotional component.

Similarities with the general population include the findings for incontinence and adult abuse, and that preceding life events may predict problem behaviours (Singleton & Lewis, 2003). There are also important differences, including incidence not being predicted by living in more deprived areas (Lorant et al, 2003), not having any daytime occupation (Singleton & Lewis, 2003), smoking status and epilepsy. The reversed trend for marital status compared with the general population was not statistically significant, hence conclusions cannot be drawn regarding it. We postulate that adults with intellectual disabilities who do not live with a family carer may not have the same lifestyle characteristics as the general population living in the same area, owing to being given accommodation in areas dissimilar from their place of origin, within which they acquired lifelong habits and preferences. In addition, the views and actions of closely involved relatives may have greater influence on them than those of their paid carers or local community. Such moves are often 'placements', determined by professionals on the basis of existing vacancies in the housing stock rather than by the individual, and made quickly owing to a sudden change in circumstances, for example following the death of a family carer or the breakdown of an existing care package. This differs from the general population who make choices for themselves in their own time regarding when to move and where to live.

Other factors are of greater relevance for this population.

Our study is an important step forward in describing mental ill-health within the population with intellectual disabilities, and identifying differences from the general population in the factors that might predict incidence. People with intellectual disabilities are known to experience health inequalities compared with the general population (Horwitz et al, 2001; US Office of the Surgeon General, 2002; NHS Health Scotland, 2004; Cooper et al, 2004; Scheepers et al, 2005). If public health interventions are focused only on areas of importance to the general population, they will fail to address the factors most relevant to the population of adults with intellectual disabilities. This is then likely to lead to a widening of the existing inequality gap. Our results are therefore important, as they are a first step towards stimulating more research in this area, and being able to influence the development of interventions, service design, public health strategy, and health and social care policy, to start to reduce health inequalities.

There is no published research regarding the incidence and predictors of mental ill-health for the intellectual disabilities population with which we could draw comparisons.

Strengths and limitations of the study

The study has several limitations. The data collection on abuse, neglect and exploitation is unlikely to have detected all survivors of these experiences, owing to surrounding secrecy. Although we interviewed the nearest relative of each participant as well as the participants themselves and the people who support them, it is possible that we missed some information on previous episodes of mental ill-health, which is often overlooked in this population. Although we have presented a standardised incidence ratio for common mental disorders, it is important to note that there are differences between our study and that of Singleton & Lewis (2003), due to different methods of assessment, different instruments and different diagnoses (the most common diagnosis reported by Singleton & Lewis was non-specific psychiatric morbidity, which they conceived to represent mixed anxiety depression, whereas problem behaviours were common in the cohort we report). The statistical relationships that we found do not necessarily mean that there is a cause and effect relationship between the time 1 variables and incidence. Our research objectives were not to derive a clinically useful predictive tool, but to assess a broad range of factors that are potentially associated with incidence of mental ill-health and problem behaviours in this population; we hope this will stimulate further research in this area, whether epidemiological or interventional.

Strengths of the study include the comprehensiveness of data collection and psychiatric assessment, the large cohort size and the longitudinal design. Cohort retention is less successful with the intellectual disabilities population than the general population (Wadsworth et al, 1992; Maughan et al, 1999; Richards et al, 2001), hence the high level of participation at time 2 is a further strength. The two time points are close enough to reduce the likelihood of missing interim-period data, which is an important consideration in study design, given the population’s known poor access to services when ill, the high job mobility of paid carers, and the limitations in communication skills and retention of information of many people with intellectual disabilities.

Urinary incontinence and ability level were retained within the statistical models at stages 2 and 3, even though the univariate analyses at stage 1 reported the relationship between these factors and incident mental ill-health to be greater than 0.05 when analysed individually. This is likely to be due to associations between some of the variables. Specifically, urinary incontinence and impaired mobility are associated (occurring more often in people with more severe intellectual disabilities), and people with Down syndrome are more likely to have moderate and severe intellectual disabilities than mild or profound intellectual disabilities, compared with the population with intellectual disabilities in general. We found both impaired mobility and Down syndrome were protective against incident mental ill-health, accounting for these findings. It is likely that several of the factors we investigated are interdependent.
Future research

Longitudinal studies to understand why a person’s type of accommodation and support affect mental health are indicated. Longer-term outcomes and predictors of recovery from or persistence of mental illness require further investigation. Our results support the need for research to lead to trials on continence management, focusing on those living without family carers, trained paying carers in the early detection and warning signs of mental ill-health, and on mental health screening programmes and early intervention trials for people in higher-risk groups for incidence of mental ill-health.

ACKNOWLEDGEMENTS

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Social and cognitive functioning, urbanicity and risk for schizophrenia

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Background  Previous work suggests that the association between urbanicity and schizophrenia may be greatest in those with pre-existing vulnerability.

Aims  To test for synergism in risk of schizophrenia between population density and a combined exposure of poor premorbid social and cognitive functioning.

Method  For 371,603 adolescent males examined by the Israeli Draft Board on social and cognitive functioning, data on population density of place of residence and later hospitalisation for schizophrenia were obtained from population-based registries.

Results  There was an interaction between population density (five levels) and poor premorbid social and cognitive functioning (interaction $\chi^2=4.6, P=0.032$). The adjusted increase in cumulative incidence associated with one unit change in population density was 0.10% in the vulnerable group (95% CI 0.019–0.18, $P=0.015$), nine times larger than that in the non-vulnerable group (0.011%, 95% CI 0.0017–0.020, $P=0.021$).

Conclusions  Risk of schizophrenia may increase when people with a genetic liability to the disorder, expressed as poor social and cognitive functioning, need to cope with city life.

Declaration of interest  None.

The factors responsible for the well-established association between urban dwelling and increased rate of schizophrenia remain unclear (Lewis et al, 1992; Haukka et al, 2001; Pedersen & Mortensen, 2001a; Peen & Dekker, 2004; van Os, 2004), but may represent an interaction between genetic vulnerability and the urban environment (Lewis et al, 1992; Haukka et al, 2001; Pedersen & Mortensen, 2001a; Peen & Dekker, 2004; van Os, 2004). The aim of our study was to investigate possible interactions between poor premorbid cognitive and social functioning, and urban living, on risk of schizophrenia. In order to do this we cross-linked information from three databases: data from the nationwide screening of the entire population of male adolescents at age 16–17 years performed by the Israeli Draft Board; data from the Israeli Central Bureau of Statistics, which uses census data to ascertain population density according to residence; and data on hospitalisations for schizophrenia from the Israeli National Psychiatric Hospitalisation Registry.

METHOD

The sample consisted of a population-based cohort of 376,623 Israeli-born male adolescents, assessed by the Israeli Draft Board at age 16–17 years. As immigrants are more likely to live in urban than in rural areas (Dey & Lucas, 2006), and immigrants have been reported to be at increased risk of schizophrenia (Cantor-Graae & Selten, 2005), we accounted for possible effects of immigration by examining only native-born Israelis.

Assessment

At age 16–17 years all Israeli males undergo cognitive, behavioural and psychiatric assessments by the draft board in order to determine their eligibility and aptitude for military service. The cognitive assessment includes Raven’s Progressive Matrices – Revised, which consist of a series of visual pattern matching and analogy problems. This test measures non-verbal abstract reasoning and visual–spatial problem-solving abilities, is highly correlated with general cognitive abilities (Duncan et al, 2000), is scored between 0 (lowest) to 30 (highest) and has a normal distribution. After the cognitive assessments are performed, an interview assessing personality and behavioural traits is administered by trained college-age individuals who have completed a 4-month training course on administration of the interview. The behavioural assessment includes a sub-scale assessing social functioning; this assessment includes questions such as ‘How many good friends do you have?’, ‘Do you have a girlfriend?’ and ‘Do you generally prefer to be with or without a group of companions?’ Scale points are 1, very poor: complete withdrawal; 2, poor: weak interpersonal contacts; 3, adequate: can form relationships with individuals and in a group; 4, good: good interpersonal relationships; and 5, exceptional: superior interpersonal relatedness. The test–retest reliability of the behavioural assessment for inductees interviewed after several days by different interviewers is above 0.8, and population-based norms are available (Gal, 1986).

On the basis of the interview and a physician’s examination, adolescents who might be suffering from behavioural disturbances or mental illness are referred for an in-depth assessment by a mental health professional, and if the adolescent warrants a psychiatric diagnosis, a board-certified psychiatrist will examine him. Criteria for referral for an in-depth mental health assessment are having the lowest score on the prediction sub-scale (which reflects the interviewer’s assessment of the adolescent’s ability to succeed in the military), a history of psychological or psychiatric treatment, current complaints, or manifestation of behavioural abnormalities during the assessment procedure. The mental health assessment is done using a semi-structured interview administered by a clinical social worker or psychologist, who enquires about personal and family history, previous psychological and psychiatric treatments, interpersonal relationships, self-esteem, self-injurious and antisocial acts, and functioning within the family and in school. If the clinician suspects that the adolescent has psychopathological symptoms, the adolescent is referred to a board-certified psychiatrist.
psychiatrist for evaluation and an ICD–9 diagnosis. For a more detailed description of the draft board assessment procedure, see Gal (1986) and Tubiana & Ben-Shachar (1982).

**Israeli Central Bureau of Statistics**

The Israeli Central Bureau of Statistics divides the country into ‘geographical units’, which are areas with 3000–4000 residents. The division is performed so that the population in each area is as homogeneous as possible in terms of ethnic background, culture and income. Information about population density (calculated as number of persons per km² of each geographical unit) was obtained, as was a measure of socio-economic status, based on number of persons per room in the home, number of computers per household, number of motor vehicles per household and per capita income (Central Bureau of Statistics, 1995).

**Israeli Psychiatric Hospitalisation Case Registry**

The Israeli Psychiatric Hospitalisation Case Registry is a complete listing of all ICD–10 discharge diagnoses assigned by a board-certified psychiatrist at the reporting facility. All psychiatric hospitals, day hospitals and psychiatric units in general hospitals are required by law to report all admissions and discharges to this registry. From the registry we identified patients with a last discharge diagnosis of schizophrenia (ICD–10 codes F20.0–F20.9).

**Study population**

The file containing data on population density by address of residence at the time of draft board assessment was linked to the draft board file, which contains results of the board’s assessments for the entire national population of adolescents. This file was in turn linked to the Israeli National Psychiatric Hospitalisation Case Registry, using national identification numbers (equivalent to the US social security number). Before the merged file was returned to the investigators for analysis, the national identification numbers were removed, leaving the merged file un-identified, in order to preserve confidentiality. This procedure identified 376 623 Israeli-born male adolescents consecutively assessed by the draft board, with a (mean 8.57, s.d. 4.06) follow-up period for psychiatric hospitalisation of 1–17 years. From this file, we excluded 2251 (0.6%) inductees who had been diagnosed during the draft board assessment as having a psychotic disorder or major affective disorder (as some of these adolescents had major affective disorder with psychotic symptoms). In addition, in order to exclude individuals who had existing psychotic illness, or who had possibly been in the prodromal phase of their illness when assessed by the draft board, we excluded 717 (0.2%) persons who had been hospitalised before or up to 1 year after the draft board assessment. Because this analysis referred only to people later hospitalised with schizophrenia, we also excluded 2300 (0.6%) adolescents who were later hospitalised with discharge diagnoses other than schizophrenia. Owing to overlap between the excluded groups, the file analysed contained data on 371 603 male adolescents who were born in Israel, were found not to have a psychotic disorder as assessed by the draft board procedure, and had not been admitted to hospital for any psychiatric disorder before or within 1 year after the draft board assessment.

**Statistical analyses**

**Main effects**

Population density was categorised (van Os et al, 2003, 2004) into five levels by dividing the population into equal quintiles. Social functioning was divided into three groups: very poor or poor; adequate; and good or excellent. Cognitive functioning (reflected by the scores on the Raven’s Progressive Matrices – Revised test) was categorised into three groups by dividing the population into equal thirds, reflecting high, intermediate and low functioning. As previous studies have shown poor social functioning and poor cognitive functioning to be independently associated with increased risk of later schizophrenia (Davidson et al, 1999), we defined adolescents with both poor social and poor cognitive functioning as having high vulnerability, compared with the rest of the population.

We first estimated the individual associations between population density and high vulnerability using Cox regression models, taking into account the amount of time of follow-up until hospitalisation, or the date that the military file was linked to the hospitalisation file. We examined the effect of being vulnerable and of population density on the risk of hospitalisation for schizophrenia, while controlling for the other factor and the potential confounding effect of socio-economic status.

**Interaction effects**

Biological synergism (co-participation of causes towards the same outcome) between environmental risk and background vulnerability is thought to be common in multifactorial disorders such as schizophrenia. The classic problem, however, is how biological synergism can be inferred from statistical manipulations with research data (statistical interaction), in particular with regard to the choice of additive or multiplicative models. It has been shown that the true degree of biological synergism can be better estimated from – but is not the same as – the additive statistical interaction (Darragh, 1997; Murray, 2003). This new method was recently applied to schizophrenia, showing synergy between traumatic head injury and familial liability (Malaspina et al, 2001) between cannabis and psychosis liability (van Os et al, 2002) and between urbanicity and proxy genetic risk factors (van Os et al, 2003, 2004; Spauwen et al, 2006). Conforming to these previous publications, we calculated the additive interaction between social and cognitive vulnerability on the one hand, and population density on the other, in models of schizophrenia. The statistical method used was similar to that used in other recent publications on this topic (van Os et al, 2003, 2004; Spauwen et al, 2006) in that effects were expressed on the additive scale (i.e. as a risk difference rather than a risk ratio), using risk difference regression in Stata, version 9.1. The risk difference regression procedure in Stata fits generalised linear models estimating risk differences (Wacholder, 1986; Hardin & Cleves, 1999). The statistical significance of the interactions was assessed by Wald test (Clayton & Hills, 1993). After calculation of the interaction term, effect sizes of population density, stratified by level of vulnerability, were calculated from the model using the appropriate linear combinations with the Stata LINCOM command. All analyses were controlled for age and socio-economic status.

**RESULTS**

Of the 371 603 non-psychotic male adolescents assessed by the Draft Board at age 16–17 years and followed for hospitalisation for schizophrenia over 1–17 years, 1174 (0.3%) were later hospitalised for
schizophrenia. While controlling for age and socio-economic status, increasing population density (adjusted hazard ratio (HR) over five levels 1.07, 95% CI 1.03–1.11) and vulnerability (OR=3.34, 95% CI 2.90–3.84) were associated with increased risk of later schizophrenia, independently of each other (Table 1). The Pearson correlation between population density and vulnerability to schizophrenia was very small (0.0098), indicating that the variables making up the interactions were independent of each other, so that the hypothesis of moderation can be distinguished from effects occasioned by mediation. The Pearson correlation between social and cognitive functioning was somewhat larger, at 0.15.

The effect of increasing population density was larger for vulnerable compared with non-vulnerable individuals (interaction $\chi^2=4.6, P=0.032$). Stratified analyses revealed that the risk difference per unit change in population density was 0.011% in the non-vulnerable group (95% CI 0.0016–0.020, $P=0.021$), whereas in the vulnerable group it was nearly ten times larger (risk difference per unit change in population density 0.10%, 95% CI 0.019–0.18, $P=0.015$), indicating that the effect of increasing population density on increasing risk of schizophrenia is particularly relevant for adolescents with both poor social and poor cognitive functioning (Table 2).

### DISCUSSION

The main finding of this historical prospective analysis is that the effect of living in areas of increasing population density increases the risk of later hospitalisation for schizophrenia in men with vulnerability for schizophrenia, expressed as poor social and cognitive abilities. As social and cognitive abilities are at least partially affected by genetic factors (Kendler et al, 1991; Plomin, 1999), these results might be interpreted to represent a gene–environment interaction affecting risk of schizophrenia, and might provide an insight into the mechanism of the well-replicated association between urban dwelling and risk of schizophrenia (Krabbendam & van Os, 2005). Past research indicates that impairments in social functioning (Kendler et al, 1982) and cognitive impairment (Szoke et al, 2005) are associated with genetic risk of schizophrenia. Living in a city is likely to be a proxy for an environmental influence such as stress, use of illegal drugs, poverty, crowding or other effects yet unknown. The gene–environment interaction might occur when people at genetic risk of schizophrenia, expressed as

<table>
<thead>
<tr>
<th>Table I</th>
<th>Population density, social functioning and cognitive functioning, and cumulative incidence of schizophrenia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>$n$</td>
</tr>
<tr>
<td>Population density</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>73 984</td>
</tr>
<tr>
<td>Low-intermediate</td>
<td>74 282</td>
</tr>
<tr>
<td>Intermediate</td>
<td>74 435</td>
</tr>
<tr>
<td>Intermediate–high</td>
<td>74 263</td>
</tr>
<tr>
<td>High</td>
<td>74 639</td>
</tr>
<tr>
<td>Social functioning</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>65 079</td>
</tr>
<tr>
<td>Intermediate</td>
<td>208 545</td>
</tr>
<tr>
<td>High</td>
<td>75 178</td>
</tr>
<tr>
<td>Cognitive functioning</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>122 395</td>
</tr>
<tr>
<td>Intermediate</td>
<td>118 644</td>
</tr>
<tr>
<td>High</td>
<td>130 560</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Comparison of the effect of population density in people with low and high vulnerability for schizophrenia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population density</td>
<td>$n$</td>
</tr>
<tr>
<td>Non-vulnerable</td>
<td></td>
</tr>
<tr>
<td>Low density</td>
<td>59 396</td>
</tr>
<tr>
<td>Low–intermediate</td>
<td>66 249</td>
</tr>
<tr>
<td>Intermediate</td>
<td>66 169</td>
</tr>
<tr>
<td>Intermediate–high</td>
<td>64 745</td>
</tr>
<tr>
<td>High density</td>
<td>61 964</td>
</tr>
<tr>
<td>Vulnerable</td>
<td></td>
</tr>
<tr>
<td>Low density</td>
<td>4 963</td>
</tr>
<tr>
<td>Low–intermediate</td>
<td>6 108</td>
</tr>
<tr>
<td>Intermediate</td>
<td>6 254</td>
</tr>
<tr>
<td>Intermediate–high</td>
<td>6 207</td>
</tr>
<tr>
<td>High density</td>
<td>5 625</td>
</tr>
</tbody>
</table>

Interaction: $\chi^2=4.6, d.f.=1, P=0.032$ |

1. All analyses controlled for age and socio-economic status.
2. Interaction tests whether the risk difference per unit increase in the vulnerable group is significantly greater than the risk difference per unit increase in the non-vulnerable group.
for schizophrenia controlled for social functioning.

As the analyses controlled for socioeconomic status, this report also confirms previous findings that socio-economic position prior to disease onset is not the cause of the association between schizophrenia and urban dwelling (Harrison et al, 2003).

**Limitations**

A previous report on the same topic reported absence of interaction between urbanicity and family history (Mortensen et al, 1999). That report, however, was based on calculation of the multiplicative interaction, and it is important to note that absence of interaction between two covariates on the multiplicative level, with the exception of some special cases, will result in presence of interaction between these covariates on the additive level, and vice versa. This distinction is important, as it has recently been shown that the degree of biological synergism can be more readily deduced from the additive interaction (Darroch, 1997). Thus, had we calculated interaction under the multiplicative model using Cox regression, we would not have found significant interaction ($\chi^2=0.8$, $P=0.37$), although also under the multiplicative model the risk per unit increase in urbanicity would have been more than 80% greater in the vulnerable group (HR=1.11, 95% CI 1.02–1.21, $P=0.020$) compared with the non-vulnerable group (HR=1.06, 95% CI 1.01–1.11, $P=0.020$), adding to the validity of our findings.

Since young women do not undergo the systematic behavioural and psychiatric assessment by the draft board, our findings apply directly only to men. Other research, however, has shown that urbanicity increases the risk of psychosis in both men and women (Peen & Dekker, 2003; Sundquist et al, 2004; Krabbendam & van Os, 2005). Also, using population density as such does not allow one to differentiate completely between urban and rural areas, as there are neighbourhoods with relatively low population density in urban areas, and neighbourhoods with relatively high population density in rural areas. This, however, has advantages as well, since being an actual measure of the number of people per unit area, it permits the assessment of the influence of population density as such, without making assumptions regarding the definitions of ‘rural’ and ‘urban’.

Another limitation is that our results were not adjusted for parental mental illness (data that were not available to us). However, when other authors adjusted for this potential confounder, the urbanisation effect remained (Pedersen & Mortensen, 2001b). Also, neither the military database nor the psychiatric hospitalisation registry includes data regarding loss to follow-up, i.e. death or emigration. However, as the period of follow-up was 8.6 years (s.d.=4.1), until approximate age 25–26 years, death should not be a major cause of loss to follow-up, as the rates of death in this age group are slightly less than 1/1000 per year (information from the Israeli Central Bureau of Statistics). We were not able to find data on emigration from Israel during the years relevant to this study.

Another potential limitation is that the case registry diagnoses are clinical rather than research diagnoses. However, these diagnoses were assigned by board-certified psychiatrists who had the benefit of observing the patient throughout one or more hospitalisations, and had been trained and re-trained in the use of the diagnostic criteria of the ICD–9 and ICD–10. Moreover, studies that have compared clinical diagnoses of schizophrenia assigned in state hospitals (Pulver et al, 1988) with research diagnoses have shown a high degree of concordance between them. In a study published by our group we found that, compared with research diagnoses established using a Schedule for Affective Disorders and Schizophrenia – Lifetime interview, the registry diagnoses of schizophrenia had a sensitivity of 0.89 (Weiser et al, 2005). Even if diagnostic misclassification had been an issue, this would have served to increase random error, making it more difficult to find an association between population density and schizophrenia, rather than producing a spurious one.

**Strengths**

To the best of our knowledge, this is the first study to use a direct measure of social functioning to assess its interaction with the association between increasing population density and risk of schizophrenia, and is similar to a previous study measuring the quantity of social interaction, which reported similar results (Stefanis et al, 2004). Also, while assessing the effect of increasing population density on risk of later hospitalisation for schizophrenia, we removed the data for adolescents diagnosed with a psychotic disorder in the draft board assessment, and those hospitalised for psychotic disorder before or within a year after the assessment. This ensured that these data were not confounded by people with a (prodromal) psychotic disorder moving from rural to urban areas. We also used multiple data-sets compiled independently of the research hypotheses, and had a relatively long follow-up period of a population-based sample.

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Longitudinal grey-matter and glutamatergic losses in first-episode schizophrenia

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Background  Progressive volumetric changes in the brains of people with schizophrenia have been attributed to a number of factors.

Aims  To determine whether glutamatergic changes in patients with schizophrenia correlated with grey-matter losses during the first years of illness.

Method  Left anterior cingulate and thalamic glutamatergic metabolite levels and grey-matter volumes were examined in 16 patients with first-episode schizophrenia before and after 10 months and 30 months of antipsychotic treatment and in 16 healthy participants on two occasions 30 months apart.

Results  Higher than normal glutamine levels were found in the anterior cingulate and thalamus of never-treated patients. Thalamic levels of glutamate were significantly reduced after 30 months. Limited grey-matter reductions were seen in patients at 10 months followed by widespread grey-matter loss at 30 months. Parietal and temporal lobe grey-matter loss was correlated with thalamic glutamine loss.

Conclusions  Elevated glutamine levels in never-treated patients followed by decreased thalamic glutamine and grey-matter loss in connected regions could indicate either neurodegeneration or a plastic response to reduced subcortical activity.

Declaration of interest  None. Funding detailed in Acknowledgements.

Systematic reviews of prospective magnetic resonance imaging (MRI) studies of schizophrenia have indicated the existence of progressive volumetric changes in a number of brain regions (Shenton et al., 2001; Steen et al., 2006). A number of explanations have been offered for these changes including the effects of medication, a programmed loss of neuropil and excitotoxic damage analogous to that caused by phencyclidine in rats (Williamson, 2006). Proton magnetic resonance spectroscopy (1H-MRS) allows in vivo quantification of glutamatergic metabolite levels at different stages of illness which could be associated with glutamatergic excitotoxicity; such studies in patients with schizophrenia have found increased glutamine levels in both the left anterior cingulate and thalamus in never-treated patients with first-episode schizophrenia and decreased levels of both glutamate and glutamine in the left anterior cingulate in patients with chronic illness (Bartha et al., 1997; Théberge et al., 2002, 2003). Volumetric MRI techniques such as voxel-based morphometry (VBM) allow the assessment of grey-matter losses that could be caused by medication effects or programmed loss of neuropil. Separate, 1H-MRS and VBM, used in a longitudinal study of first-episode schizophrenia, permit comparison of the time evolution of brain abnormalities with that expected through pathophysiological mechanisms involving grey-matter loss alone or glutamatergic losses alone. By combining the two techniques one can examine pathophysiological mechanisms involving both grey-matter loss and glutamatergic changes such as neuroplasticity or neuropil loss. The purpose of this study was to determine whether glutamatergic abnormalities in schizophrenia correlated with grey-matter losses during the first years of illness.

We predicted that patients experiencing a first episode of schizophrenia would have higher than normal glutamatergic metabolite levels on the basis of our previous studies (Bartha et al., 1997; Théberge et al., 2002). From a previous cross-sectional study of chronic schizophrenia showing lower than normal glutamine levels in the anterior cingulate (Théberge et al., 2003), glutamatergic metabolite levels and grey-matter volumes were expected to decrease after 30 months in patients experiencing a first episode of schizophrenia and to remain unchanged in healthy participants. Furthermore, we predicted that the effect of medication alone on glutamatergic metabolites and grey-matter volumes would be minimal and that disease-related reductions in these quantities would become apparent when comparing never-treated patients and patients treated for approximately 2.5 years (30 months), but these parameters would not decrease in healthy participants assessed 2.5 years apart. Finally, we expected that the longitudinal differences in glutamatergic metabolites in the anterior cingulate and thalamus would correlate with the grey-matter volume differences in functionally connected cortical areas, because glutamatergic losses in a given region can also be attributed to loss of glutamatergic afferents from another structure, in which case local reductions in glutamatergic metabolites could be obtained without local grey-matter losses and in response to remote grey-matter losses.

METHOD

Sixteen never-treated participants experiencing a first episode of schizophrenia and 16 healthy participants volunteered for the study after the protocol was fully explained, and written informed consent was obtained according to the guidelines of the Review Board for Health Sciences Research Involving Human Subjects at the University of Western Ontario in Canada. Participants were recruited by advertisement within the community and health network of London, Ontario. Demographic information about each group of participants is summarised in Table 1. The first MRS assessment of 12 of the participants with schizophrenia and 6 healthy participants was part of a previous study (Théberge et al., 2002). The second and third examinations of participants with schizophrenia occurred 10 months (s.d. = 3) and 34 months (s.d. = 9) respectively after the first examination. A mean of 35 months (s.d. = 12) separated the healthy participants’ first and second examinations. For convenience, the data
groups are referred to as follows: participants with schizophrenia first assessment (never treated), NT; second assessment (10 months of treatment), 10 M; third assessment (30 months of treatment), 30 M; healthy participants first assessment, HPARI; second assessment, HPAR2.

All participants were assessed by a psychiatrist using the Structured Clinical Interview for DSM-IV (SCID; First et al., 1997). Eleven participants were classified as having paranoid schizophrenia and five as having undifferentiated schizophrenia. The duration of untreated psychosis for participants with schizophrenia was evaluated and defined as the elapsed time between the first examination and the first appearance of positive symptoms. Symptoms of participants with schizophrenia were evaluated using the Scale for the Assessment of Negative Symptoms (SANS; Andreasen, 1983a) and the Scale for the Assessment of Positive Symptoms (SAPS; Andreasen, 1983b). The mean parental educational level of the most educated parent was rated on a four-point scale for all participants (level 1, grade 10 or below; level 2, grades 11–13; level 3, college 1–3 years; level 4, college 4 years or more). Handedness was assessed using a questionnaire (Bryden, 1977).

Four participants with schizophrenia received medications other than antipsychotics 1–10 days prior to their first scan (see Table 2). For patients receiving antipsychotic treatment, chlorpromazine equivalent dosages were calculated (Bezchlibnyk-Butler & Jeffries, 2002; Woods, 2003). At their second assessment, all patients were receiving any antipsychotics (not clozapine), with the exception of one patient who received haloperidol and two who did not receive antipsychotic medication but were judged to be clinically stable. At the final assessment two participants were taking clozapine and a third participant was no longer receiving medication.

None of the participants had a history of head injury or of drug or alcohol misuse in the year before the scan, or a serious medical illness (according to SCID and anatomical MRI). Participants reported not using substances on the day of the scan; urinalysis was not always performed.

**MRS and MRI**

All MRI and MRS data were obtained using a 4.0 T Varian (Palo Alto, California, USA)/Siemens (Erlangen, Germany) scanner with a Varian Unity Inova console, Siemens Sonata gradients and a circularly polarised hybrid head resonator (XLR Imaging Inc., London, Ontario, Canada). The methods of MRI data acquisition and MRS data acquisition and data processing were identical to those described in a previous report by Théberge et al. (2002). These procedures are described briefly below.

After a manual adjustment of global magnetic field uniformity with first- and second-order shims, a $T_2^*$-weighted three-dimensional imaging volume was obtained (three-dimensional magnetisation-prepared fast low angle shot (MP-FLASH), inversion time (TI) 500 ms, time to repetition (TR) 11.4 ms, time to echo (TE) 6.2 ms, $\alpha=30^\circ$, 2.75 mm thick, field of view 20 cm, matrix 256 × 256) and used to prescribed MRS voxel position, manually segment grey/white matter and cerebrospinal fluid (CSF) within MRS voxels and perform voxel-based morphometry.

Localised short echo time $^1$H-MRS measurements (stimulated echo acquisition mode, STEAM; TR=2000 ms, TE=20 ms, mixing time (TM)=30 ms, acquisition time 1.5 s, dwell time 500 $\mu$s, size 10 × 10 × 10 mm$^3$, eight-step phase cycle, averages: 256 water-suppressed, 16 unsuppressed) were obtained from voxels in the left anterior cingulate and left thalamus of each participant (retrospective description of average Talairach coordinates: anterior cingulate, −5.9, 46.7, 1.3 – Brodmann area (BA) 32; thalamus, −6.9, −14.3, 4.2). Voxels were positioned by the scanner operator (J.T. or N.A.) based on anatomical landmarks, as trained by our local neuroanatomy expert (N.R.). Local field uniformity and radio frequency pulse power were manually optimised for each voxel. The line shapes of the water-suppressed spectra were restored to a Lorentzian form using a combined QUALITY and eddy current correction (ECC) lineshape correction (QUECC; as in Bartha et al., 2000b). Residual water resonances between (4.2–6.2 ppm) were modelled using a Hankel–Lanczos singular value decomposition procedure and subtracted (Bartha et al., 1999). Before spectral quantification, the quality of every spectrum was evaluated using two visual scales to provide an index composed of a number from 1 to 10 (Visual Appreciation Scale) and a letter from A to E (Baseline and Artefact Scale). The combined scales allow a more structured determination of spectral quality and are used in the decision to discard a spectrum in cases of excessive voluntary or involuntary movement by the participant (further information about these scales is presented in Data Supplement 1 to the online version of this paper). In this study, we discarded spectra with a Visual Appreciation Scale rating lower than 5 and/or a Baseline and Artefact Scale rating poorer than B, and for which the spectral quantification procedure described below was unsuccessful (no metabolite level data produced). Quantification of the water-suppressed spectra was performed using the Lawson Health Research Institute Fitman spectral analysis suite (Bartha et al., 1999, 2000a), a software package developed by our group and used by us and by other international collaborators in more than 30 publications. Time domain fitting of the water-suppressed spectra used the first 1024 points acquired. The quantification model used a priori knowledge from 12 metabolite solutions and partial prior knowledge for three macromolecules and ten broad components as described by Bartha et al. (1999, 2000a) (a complete list of the modelled spectral components can be found in the caption to Fig. 2). This quantification model using partial prior knowledge of broad spectral components is ideal for our short echo time STEAM-localised spectra acquired without outer-volume suppression (Bartha et al., 2000a). The water-suppressed spectra were lineshape corrected and fitted to a single Lorentzian model. Metabolite levels were obtained by normalising the metabolite amplitude by the corrected amplitude of the water-suppressed acquisition (further information is presented in Data Supplement 2 to the online version of this paper). Although other MRS studies present metabolite levels calculated in this fashion as ‘absolute’ concentrations in mol/l or mol/kg$_{ww}$, we present them as metabolite levels in arbitrary units owing to the arbitrary nature of the numerical values chosen for quantities such as temperature-dependent molecular weights and densities as well as the assumed water content of different brain tissues (grey matter 81%, white matter 71%, CSF 100%). These quantities were obtained from the literature rather than measured in each individual participant because of the time needed to obtain such measurements. Additional correction for relaxation weighting ($T_1$, $T_2$) and diffusion weighting of both metabolites and the water reference signals would be needed to claim absolute quantification;
however, the magnitude of changes in these tissue parameters required to produce a significant change in metabolite levels is typically considered unlikely to be found in brains not affected by neoplasms, and thus these additional corrections are often ignored. The coefficients of variation of N-acetylaspartate, glutamate and glutamine metabolite levels using this technique (4.0 T, STEAM, TE=20 ms, 1.5 cm³ volume of interest) were 8%, 11% and 24% inter-individual and 7.3%, 8.9% and 16.9% intra-individual (Bartha et al, 2000).

Only metabolite levels, ratios of glutamate to glutamine (Glut/Gln) and macromolecular levels with inter-individual coefficients of variation less than 75% were included in statistical comparisons. In a normally distributed sample this upper limit guarantees that less than 10% of the sample would have negative values. Negative concentrations are impossible and never produced by our quantification routine. Thus the upper limit criterion prevents metabolite levels for which a significant proportion of samples have hit the lower detection threshold (not normally distributed) from being included in the statistical analysis (which assumes normality). Quantities satisfying this upper limit criterion included the metabolite levels of N-acetylaspartate, glutamate, glutamine, choline-containing compounds, creatine and phosphocreatine, myo-inositol and taurine for the anterior cingulate spectra; in addition, scyllo-inositol met the criterion in the thalamic spectra. Macromolecular levels of unidentified broad components M1.70, M1.41, M1.30, M1.22 and M0.90 in the anterior cingulate spectra and M3.15, M3.00, M1.75, M1.70, M1.50, M1.41, M1.30 and M0.90 in the thalamus met the coefficient of variation upper limit criterion as well as the metabolite level Glu/Gln in both regions of interest. Results for metabolites not satisfying this upper limit criterion are not reported. These metabolites were nevertheless part of the spectral quantification template.

For the two measurement period data (NT and 30M v. HPAR1 and HPAR2) the overall layout entailed a 2 x 2 split-plot factorial design with ‘measurement period’ being the two-level within-participant factor and ‘participant group’ being the two-level between-participant factor. With our directional hypotheses on the progression of glutamate and glutamine levels, unidirectional statistical tests (z=0.05) were applied. Significant effects, however, met two-tailed criteria throughout (Stevens, 1996). The time evolution of glutamate and glutamine levels for participants with schizophrenia was tested separately from other metabolites because of our directional hypotheses concerning these metabolites. Here, the data layout entailed a three-level repeated-measures design using measurements from NT, 10M and 30M. Spectroscopic data for which we had no a priori hypotheses (macromolecular levels, the Glu/Gln ratio and the set of metabolite levels residual to glutamate and glutamine) were examined using multivariate analysis of variance (MANOVA) applied region-wise using the 2 x 2 (groups x time) split-plot factorial layout. For the patient group, the above measures were subjected to a region-wise MANOVA using the aforementioned three-level repeated-measures design. Constituent univariate analyses of variance were applied to the individual variables of the multivariate set pursuant to significant parent multivariate results (z=0.05). Two-tailed alphas of 0.05 (Hummel & Sligo, 1971; Stevens, 1996) were used for the follow-up univariate tests (e.g. the statistical treatment in Jensen et al, 2004).

Correlation between metabolite levels of participants with schizophrenia and symptoms scores (SANS and SAPS) as well as with length of illness and chlorpromazine equivalent dosage (30M only) were evaluated using the Pearson product-moment correlation coefficient (P<0.001).

Voxel-based morphometry maps were obtained for each participant using SPM2 (Wellcome Department of Imaging Neuroscience, University College London, UK) and the T₁-weighted images. Images were spatially normalised to the T₁-weighted template provided by SPM2 (Montreal Neurological Institute brain) and segmented into grey/white/CSF images with the modified model cluster analysis after correcting for intensity non-uniformity (Ashburner & Friston, 2000). Images were then modulated by the Jacobian determinants obtained in the normalisation step and finally smoothed using an isotropic Gaussian kernel (12 mm full width at half maximum) (Ashburner & Friston, 2001). The SPM2 general linear model produced maps of the t statistic for grey-matter concentration changes between participants (NT v. HPAR1, 30M v. HPAR2) or within participants (NT v. 10M, NT v. 30M, 10M v. 30M, three-level repeated-measures analysis; HPAR1 v. HPAR2) with a corrected z<0.05 and extent threshold k=5. Difference maps of grey-matter concentrations (NT–30M) were used in simple correlations with scanning, treatment and MRS variables. Uncorrected z values of 0.001 and k=5 were set to explore the hypothesised correlation of grey-matter loss and glutamine loss.

RESULTS

The participants’ demographic and clinical characteristics and data availability are summarised in Tables 1 and 2.

General ¹H-MRS and VBM results

The proton MRS section of this study produced 152 spectra: 2 regions per participant x (3 time points x 16 participants with schizophrenia – 3 missing time points) + (2 time points x 16 healthy participants – 1 missing time point). Six of these spectra, obtained from participants with schizophrenia, were considered unusable because of excessive voluntary or involuntary movements during the acquisition (Table 1); no successful quantification was obtained from these six spectra. Discarded spectra had spectral quality ratings of 0E, 0E, 4C, 3E and 10D and one thalamic spectral acquisition was abandoned before completion owing to breathing-induced phase variations. All discarded spectra had been obtained from male participants (anterior cingulate: two NT, one 10M; thalamus: one NT, two 10M) and their handedness was as follows: anterior cingulate, right-handed participants exclusively (two NT, one 10M); thalamus, two right-handed participants (one NT, one 10M) and one left-handed participant (10M).

Mean metabolite levels for both regions and all groups are presented in Fig. 1 along with group standard deviations and statistics for significant differences (macromolecule levels for both regions and all groups are presented in Data Supplement 3, and group standard deviations of metabolite levels and minimum detectable percentage difference between groups in Data Supplement 4 to the online version of this paper). A typical spectrum from the anterior cingulate of a participant with schizophrenia is shown in Fig. 2, together with the spectral model and components. Fitted line widths of unsuppressed water signals and time domain N-acetylaspartate area signal-to-noise ratios are presented in Data Supplement 5 to the online version of this paper. The distribution of thalamic glutamine levels is
presented in Fig. 3 for all participant groups. voxel-based morphometry used 77 anatomical volumes (3 time points × 16 participants with schizophrenia – 3 missing time points) + (2 time points × 16 healthy participants). Group standard deviation estimates for grey-matter ‘concentrations’ and minimum detectable difference between groups, based on data from a selected volume of interest in the superior temporal gyrus are presented in Data Supplement 4, and the distribution of VBM grey-matter concentrations is shown in Fig. 3.

Table 1  Participant information and data availability.

<table>
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<tr>
<th></th>
<th>Group 1</th>
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<tr>
<td></td>
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<td>96 (108)</td>
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<td>Length of illness, weeks: mean (s.d.)</td>
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</table>

DUP, duration of untreated psychosis; MRS, magnetic resonance spectroscopy; SANS, Scale for the Assessment of Negative Symptoms; SAPS, Scale for the Assessment of Positive Symptoms; VBM, voxel-based morphometry.

1. Groups: participants with schizophrenia: NT, never treated; 10M, stabilised with medication for approximately 10 months; 30M, approximately 30 months after the start of treatment; HPAR1, healthy participants matched in age, gender, handedness and parental education to the NT group; HPAR2, healthy participants examined approximately 30 months after the first assessment.

2. Level I, grade 10 or less; 2, grades II–III; 3, 1–3 years of college; 4, 4+ years of college.

3. Defined as time between appearance of first positive symptoms and scan.

Statistical comparisons

Proton MRS and VBM data were compared between participants with schizophrenia and healthy participants (between participants) and among participants with schizophrenia at different time points (within participants). A summary of all statistical comparisons is presented in Data Supplement 6 and details of significant VBM findings are presented in Data Supplements 7 and 8. Significant findings are presented below.

Between-participant comparisons

Anterior cingulate glutamine levels were significantly elevated among participants with schizophrenia (NT) compared with healthy participants (HPAR1) (see Fig. 1). This predicted result was embedded in a significant main effect of groups pursuant to the routine tests of the 2 × 2 split-plot factorial analysis (F = 4.67, df = 1.26, P = 0.04). The 2 × 2 analysis revealed a significant effect for group at the univariate level in metabolite levels of N-acetylaspartate (see Fig. 1) and macromolecular levels M1.41 (F = 4.773, df = 1.26, P = 0.038) and M1.30 (F = 4.945, df = 1.26, P = 0.035). These group differences were not significant at the multivariate level of analysis; although not ignored, they are presented with this associated caveat.

Left thalamic glutamate and glutamine levels showed significantly higher glutamine in participants with schizophrenia (NT) than in healthy participants (HPAR1) (see Fig. 1), but no significant difference in glutamate levels. The predicted elevation in level of glutamine for the patients’ first measurement period was considered as embedded in a significant (repeatedly computed) group × time interaction (F = 5.76, df = 1.27, P = 0.024), and main effect of time (P = 0.02). Univariate split-plot factorial analysis of thalamic metabolite levels residual to glutamate and glutamine, macromolecular levels and the Glu/Gln ratio showed a significant group effect for the metabolite level of taurine (see Fig. 1), whereby participants with schizophrenia had lower levels than healthy participants. Note that Levene’s test for equality of error variances disclosed no significant difference for anterior cingulate and thalamic glutamate and glutamine, a statistical bias consideration when comparing groups of unequal size (Box, 1953, 1954; Milligan et al., 1987).

Between-group comparisons of grey-matter volume changes (VBM) showed significant differences between the last assessment of healthy participants and participants with schizophrenia (HPAR2 > 30M) but not in other comparisons (HPAR1 > NT, HPAR1 < NT, HPAR2 < 30M) using corrected t-statistics (z = 0.05,
Table 2 Medication in the study sample (see Table 1 for definition of study groups)

<table>
<thead>
<tr>
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<th>NT (n=16)</th>
<th>10M (n=16)</th>
<th>30M (n=16)</th>
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<tr>
<td>Mean dosage, mg (s.d.)</td>
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<tr>
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<td>196 (145)</td>
<td>154 (150)</td>
<td></td>
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</table>

CPZeq, chlorpromazine equivalent.
1. Daily dosage.
2. Daily dose given as part of treatment.
3. Dose received 1-10 days before the scan.
4. Divalproex.

k = 5). Two small regions of significant grey-matter reduction were located in the left superior temporal gyrus (BA 22, k = 77) and the left caudate head (k = 10).

Within-participant comparisons (two-level)

The split-plot factorial multivariate analysis of anterior cingulate macromolecular levels, Glu/Gln and the set of metabolite levels residual to glutamate and glutamine yielded a significant effect for time only (F = 4.681, d.f. = 11,16, P = 0.003). Univariate split-plot factorial analysis of these measurements revealed a significant effect for time only in two macromolecular levels: M1.70 (F = 7.924, d.f. = 1,26, P = 0.009) increased with time, and M1.41 (F = 11.482, d.f. = 1,26, P = 0.002) decreased with time. Levene’s test showed significant differences in the error variances of participants’ Glu/Gln ratio for the first assessment (F = 8.940, d.f. = 1,26, P = 0.006). As the group of participants with schizophrenia had a smaller variance, and lower n owing to missing/excluded data, the lack of significant effects for this measure was not a statistical artefact (Milligan et al., 1987).

The split-plot factorial MANOVA on thalamic metabolite levels residual to glutamate and glutamine, macromolecular levels and Glu/Gln yielded no significant effect. Univariate split-plot factorial analysis of the same measurements nevertheless revealed a significant effect for time in two macromolecular levels: both M1.50 (F = 5.745, d.f. = 1,26, P = 0.029) and M1.41 (F = 7.123, d.f. = 1,27, P = 0.013) decreased with time. Pursuant to the significant findings of the three-level analysis of the VBM data, within-group two-level comparisons (NT > 10M, NT > 30M, 10M > 30M) were computed post hoc with a more exploratory uncorrected z = 0.00001 and k = 5 (d.f. = 1,12). Significant reductions in grey-matter volume were found in all three comparisons (results are presented in Data Supplement 6).

Grouping of VBM data from participants with schizophrenia according to subtype (paranoid vs. undifferentiated) in a 2 × 2 split-plot factorial design did not produce any significant effect for group using a corrected z = 0.05 and k = 5. Grey-matter loss across time (NT × 30M) was not significantly different between subtypes (corrected P < 0.05, k = 5).

Based on the grey-matter, white-matter and CSF segmentation procedure performed on the anterior cingulate and thalamic MRS volumes of interest, the calculation of tissue content correction factors used in spectral quantification, a technique akin to traditional grey-matter volume measurements, the amount of
Longitudinal evaluation of metabolite levels in the left anterior cingulate and left thalamus of healthy participants and participants experiencing a first episode of schizophrenia (HPAR1, HPAR2) (NT, 10M, 30M; see text for definition of groups). Key: a, significantly different from HPAR1 (anterior cingulate: t = 2.33, d.f. = 1.27, P = 0.014; thalamus: t = 2.20, d.f. = 1.28, P = 0.018); b, significant group effect for NAA in 2 × 2 split-plot factorial analysis: HPAR1 and HPAR2 × NT and 30M (F = 4.431, d.f. = 1.26, P = 0.045); c, 30M level significantly different from NT level (t = 2.802, d.f. = 1.13, P = 0.008); d, 30M level significantly different from 10M level (Gln: t = 2.144, d.f. = 1.11, P = 0.028; tCr: F = 6.802, d.f. = 1.11, P = 0.048); e, significant group effect for Tau in 2 × 2 split-plot factorial analysis: HPAR1 and HPAR2 × NT and 30M (F = 4.423, d.f. = 1.27, P = 0.045). Cho, choline-containing compounds; Glin, glutamine; Glu, glutamate; Myo, myo-inositol; NAA, N-acetylaspartate; Tau, taurine; tCr, creatine and phosphocreatine; Syl, scyllo-inositol.

Correlations

None of the anterior cingulate and thalamic metabolite levels, macromolecular levels or Glu/Gln showed a significant correlation with SANS or SAPS scores, length of illness or antipsychotic dosage (chlorpromazine equivalents) (P > 0.001). Correlation coefficients of glutamine levels with SANS scores, SAPS scores, length of illness and antipsychotic dosage were respectively 0.208 (P = 0.186), 0.016 (P = 0.920), − 0.259 (P = 0.098) and − 0.217 (P = 0.168) in the anterior cingulate, and 0.134 (P = 0.398), 0.242 (P = 0.123), − 0.137 (P = 0.399) and 0.058 (P = 0.714) in the thalamus. Although these spectral components overlap in terms of chemical shift, there was no significant correlation between anterior cingulate levels of glutamine and M2.05 (r = − 0.381, P = 0.01, n = 73) which is a macromolecular level that was not included in the planned statistical analyses (s.d. > 75%). However, upon post hoc examination no significant difference in M2.05 levels was found between any group of participants.

Correlation of grey-matter loss in participants with schizophrenia (NT − 30M) and antipsychotic dosage at 30M showed no significant results using a corrected α value of 0.05. However, significant correlation was found in three areas of the brain using an exploratory uncorrected α of 0.001: left frontal lobe (precentral gyrus, BA 9, 2 split-plot factorial analysis: HPAR1 and HPAR2 × NT and 30M (F = 4.431, d.f. = 1.26, P = 0.045); left frontal lobe (superior gyrus, BA 10, x y z = − 18, 64, 18; P < 0.001, t = − 8.381); right frontal lobe (inferior gyrus, BA 9, x y z = − 32, 16, 28; P < 0.001, t = − 4.93).

Grey-matter loss (NT − 30M) did not show any significant correlation with the...
Grey-matter volumes and glutamine levels in the five study groups (see text for key to groups):

Gyrus grey-matter concentration loss and lobe (inferior gyrus, BA 20, angular gyrus, BA 39, thalamic glutamine (NT) found in four areas of the brain when using an uncorrected \( z \) of 0.001.

Correlation of grey-matter loss (NT – 30M) assessed by VBM with reduction in thalamic glutamine (NT – 30M) was found in four areas of the brain when using an uncorrected \( z \) of 0.001 and \( n = 14 \): right parietal lobe (precuneus, BA 7, \( x \ y \ z = 16, -44, 46; P < 0.001, t = 6.28 \)); left parietal lobe (angular gyrus, BA 39, \( x \ y \ z = -30, -64, 30; P < 0.001, t = 6.09 \)); left temporal lobe (inferior gyrus, BA 20, \( x \ y \ z = -58, -36, -22; P < 0.001, t = 5.15 \)); left temporal lobe (superior gyrus, BA 41, \( x \ y \ z = -44, -26, 12; P < 0.001, t = 4.40 \)). The correlation between left superior temporal gyrus grey-matter concentration loss and left thalamic glutamine loss is presented in Fig. 5 (\( r = 0.741, n = 14, P < 0.001 \)).

Given the finding of positive correlation between thalamic glutamine loss and grey-matter volume loss from the VBM analysis, we expected a similar positive correlation between voxel grey-matter loss (first scan to last scan), as assessed during the grey/white/CSF segmentation procedure of the MRS analysis, and glutamine loss (first scan to last scan) in patients, and no correlation in controls. No significant correlation was found overall. In the anterior cingulate of patients (NT – 30M) a trend towards a significant negative correlation was observed (\( r = -0.453, P = 0.120, \text{two-tailed,} n = 13 \)), but no significant result was observed in controls (\( r = -0.149, P = 0.597, \text{two-tailed,} n = 15 \)). No significant correlation was observed in the thalamus of patients (\( r = 0.158, P = 0.590, \text{two-tailed,} n = 14 \)) and controls (\( r = 0.027, P = 0.925, \text{two-tailed,} n = 15 \)).

**DISCUSSION**

**Glutamatergic alterations**

Proton MRS showed significantly increased levels of glutamine in both the left anterior cingulate and the left thalamus of never-treated participants with schizophrenia compared with healthy participants. These results are akin to the medial prefrontal findings of Bartha et al. (1997) in a completely different cohort of patients and controls, and partially replicate the findings of Theberge et al. (2002), who used an overlapping cohort of participants mostly composed of the same patients (12 of 16 NT) and a different group of controls (6 of 16 HPAR1). The results are consistent with a recent report of increased glutamine in the anterior cingulate of healthy participants administered a low dose of ketamine, a drug known to reliably produce schizophrenia-like symptoms (Rowland et al., 2005), and with a report of increased glutamatergic metabolites in the medial frontal cortex of adolescents at high risk of developing schizophrenia (Theberge et al., 2004).

Glutamine levels did not significantly decrease in the left thalamus in participants with schizophrenia whose symptoms were stabilised with medication for 10 months, suggesting that medication or clinical status did not affect the findings. The absence of significant correlation between medication levels or clinical assessments and glutamine levels also suggest that these variables do not explain the findings. Decrease in thalamic glutamine within a period of 30 months in participants with schizophrenia
could be explained by an excitotoxic process. However, glutamine levels did not decrease below healthy levels in either regions of interest. This contrasts with lower-than-normal glutamate and glutamine levels found in the anterior cingulate of patients with chronic schizophrenia (duration of illness 15 years) (Théberge et al., 2003). If excitotoxicity is responsible for glutamine decreases from elevated first-episode levels to lower than normal levels in patients with chronic illness, this study suggests that more than 30 months must elapse for its manifestation. This result also contrasts with the higher than normal thalamic levels of glutamine found in patients with chronic schizophrenia (Théberge et al., 2003); however, the majority of these patients were being treated with conventional rather than atypical antipsychotics for 10 years or more, which might account for the difference.

Anterior cingulate glutamine levels in never-treated participants with schizophrenia did not significantly decrease upon follow-up, suggesting that glutamatergic activity remains elevated in this region for at least 30 months. As expected, no significant difference in glutamine levels was observed between the initial and follow-up examination in healthy participants, suggesting that aging does not affect normal glutamatergic activity over a period of 30 months. We did not observe any significant difference in N-acetylaspartate levels between participants with schizophrenia and healthy participants at first assessment or follow-up, which is consistent with studies using the same (Bartha et al., 1997; Théberge et al., 2002, 2003) or similar methods (short echo time MRS and spectral analysis without non-physical baseline modelling).

Volumetric alterations

Voxel-based morphometry uncovered no significant grey-matter volume difference in the anterior cingulate and thalamus when comparing never-treated participants with schizophrenia and healthy participants. This suggests that significant differences in glutamine levels observed in never-treated participants compared with healthy participants are unlikely to be secondary to a programmed loss of neuropil (Selemon et al., 1999) prior to onset of symptoms or to other neurodevelopmental processes involving early grey-matter loss. However, elevated levels of glutamine in the early stages of untreated schizophrenia suggest a pre-existing dysregulation of the limbic basal ganglia–thalamocortical pathway (Alexander et al., 1990), the origin of which is not apparent from this study. No grey-matter volume difference was detected between the two healthy participant assessments 30 months apart. This suggests that grey-matter reductions related to normal ageing are unlikely to play a part in our findings.

Both the 10-month and 30-month assessments of participants with schizophrenia showed significant reductions in grey matter compared with the first (never-treated) assessment. After 10 months of treatment and stabilisation of symptoms, only a small cluster of voxels showed significantly reduced grey-matter volume in the left prefrontal cortex and temporolimbic regions. After 30 months of treatment the significant reductions were widespread and had expanded to include regions of the frontal, temporal, parietal and limbic lobes. These observations are similar to those of previous studies (Shenton et al., 2001; Thompson et al., 2001; Gogtay et al., 2004; Honea et al., 2005), particularly those looking at patients with first-episode disorder. Even after a short period of treatment (10 months) and stabilisation of symptoms, grey-matter volume reductions were observed, which suggests that antipsychotic medication might be partly responsible for the losses. However, the progressive nature of the grey-matter losses demonstrated at the 30-month assessment, when both clinical status and antipsychotic treatment had remained practically unchanged, suggests that the additional losses are disease-related. Late effects of antipsychotic medication on cortical volume are also a possibility.

Excitotoxicity or plasticity?

It is curious that no grey-matter loss was observed in regions where elevated glutamine was detected in never-treated participants with schizophrenia; this was expected, assuming the action of a glutamatergic excitotoxic process. It is possible that the use of a 12 mm smoothing kernel in the VBM analysis reduced our sensitivity to grey-matter changes in small structures (White et al., 2001) within the MRS regions of interest. However, traditional grey/white/CSF segmentation performed on the MRS volume of interest only also did not detect significant grey-matter loss in the anterior cingulate and thalamus. Detected regions of grey-matter loss, such as the dorsolateral prefrontal cortex and superior temporal gyrus, are closely connected with both the thalamus and the anterior cingulate. Interestingly, the posterior cingulate – one of the regions demonstrating significant reduction in grey matter at the 30 months assessment – is one of the first regions to incur excitotoxic damage after an acute administration of glutamate N-methyl-D-aspartate receptor antagonist in the rat model of schizophrenia of Olney & Farber (1995). Other schizophrenia models have proposed that regions of the dorsolateral prefrontal cortex and temporal lobe cortex regulate the limbic basal ganglia–thalamocortical circuit which includes the anterior cingulate and thalamus (O’Donnell & Grace, 1998). Thus a programmed loss of neuropil in these cortical regions prior to the onset of symptoms could be associated with a secondary excitotoxic process in the limbic basal ganglia–thalamocortical circuit. However, in our study no lower than normal grey-matter volume consistent with loss of neuropil was observed at the initial assessment in those cortical regions. Thalamic input has an important role in directing the neureplastic processes during cortical development (Jafari et al., 2007) and probably has a significant role in adult cortical plasticity (Weinberger, 1995). The reciprocal connections between the thalamus and cortical regions are a potential conduit by which decreasing thalamic activity (evidenced in this study by a progressive reduction in glutamine) could lead to a plastic response. The finding of significantly correlated superior temporal lobe grey-matter loss and thalamic glutamine loss supports this interpretation.

Limitations

Some limitations should be acknowledged. Proton MRS measurements of glutamate and glutamine reflect the combined intra- and extraneuronal concentration within a somewhat coarse region of interest despite the use of high-field systems. Increases in glutamine concentration may not reflect increases in glutamatergic activity if a problem exists with the conversion of glutamine to glutamate in the astrocytic compartment of the glutamate-glutamine cycle. However, there is no consistent evidence for such enzymatic abnormality in schizophrenia. Glucose metabolism also influences glutamatergic neurotransmission by synthesising 15–20% of the glutamate.
entering the glutamate–glutamine cycle (Hertz et al., 1999). The single-voxel MRS localisation technique used produced high-quality data from the anterior cingulate and thalamus yet did not permit the acquisition of MRS data from other regions of the brain potentially implicated in schizophrenia within a reasonable examination time. Macromolecular signals have been hypothesised by some to potentially influence glutamate and glutamine measurements. However, post hoc correlations of glutamine levels and overlapping macromolecular levels do not show a significant link, with the exception of thalamic glutamine levels and macromolecular level M2.05 which show a loose association. This association is not sufficient to explain significant findings in thalamic glutamine. Correlation with a greater number of overlapping components would have been necessary in order to explain the glutamine findings because of the fairly wide spread in chemical shift of glutamine’s gamma and beta multiplets. Such a quantification artefact would probably have occurred in anterior cingulate data as well, yet no correlation was found between glutamine and macromolecular levels in this region. The number of participants in this study is fairly small owing to the complexity of following them up over several years. Steen et al. (2005) suggest that 39 patients and 29 controls are needed to obtain 80% statistically power to detect a 10% difference in N-acetylaspartate. Consequently, the number of participants might not have been sufficient to detect differences in metabolites such as N-acetylaspartate. The VBM technique may have limited ability to detect grey-matter volume differences in certain parts of the brain, and the use of large smoothing kernels may render the analysis sensitive to partial volume effects. Future studies should verify the observed progressive loss of grey matter with more conventional but time-consuming volumetric techniques.

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Recurrence of major depression in adolescence and early adulthood, and later mental health, educational and economic outcomes

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Background It is unclear how the recurrence of major depression in adolescence affects later life outcomes.

Aims To examine the associations between the frequency of major depression at ages 16–21 and later outcomes, both before and after controlling for potentially confounding factors.

Method Data were gathered from a 25-year longitudinal study of a birth cohort of New Zealand children (n = 982). Outcome measures included DSM–IV symptom criteria for major depression and anxiety disorders, suicidal ideation and attempted suicide, achieving university degree or other tertiary education qualification, welfare dependence and unemployment, and income at ages 21–25 years.

Results There were significant (P < 0.05) associations between the frequency of depression at ages 16–21 years and all outcome measures. After adjustment for confounding factors, the association between frequency of depression and all mental health outcomes, and welfare dependence and unemployment, remained significant (P < 0.05).

Conclusions The frequency of depression in adolescence and young adulthood is associated with adverse mental health and economic outcomes in early adulthood.

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Over the past two decades there has been increasing research into the antecedents, prevalence and consequences of depression in adolescence and early adulthood (Petersen et al, 1993; Cicchetti & Toth, 1998; Lewinsohn et al, 1998; Fergusson & Woodward, 2002; Glied & Pine, 2002). This research has established that depression is relatively common among adolescent and early adult populations (Fleming & Offord, 1990; Lewinsohn et al, 1993; Silverman et al, 1996), and that many of those becoming depressed will experience recurrent episodes of depression over the period of adolescence and early adulthood (Rao et al, 1999; Lewinsohn et al, 2000). For example, Lewinsohn et al (1993) found that 18.4% of a random community sample of adolescents experienced at least one recurrent episode of major depression. Also, there has been growing evidence to suggest that depression in adolescence and early adulthood is associated with longer-term adverse consequences, including increased risks of later depression (Lewinsohn et al, 2000; Fergusson & Woodward, 2002), anxiety (Fergusson & Woodward, 2002), suicidal behaviours (Kovacs et al, 1993; Fergusson & Woodward, 2002; Glied & Pine, 2002), and educational underachievement (Fergusson & Woodward, 2002; Andrews & Wilding, 2004; Hysenbegasi et al, 2005). For example, Fergusson and Woodward (2002), using a longitudinal sample, found that depression at ages 14–16 years was associated with increased risk of major depression, anxiety disorder, suicide attempts and educational underachievement by age 21 years.

Although it has been well established that depression in adolescence and early adulthood is often a recurrent condition, and that depression is also associated with adverse longer-term outcomes, there appears to have been little research examining the linkages between recurrent depression in adolescence and early adulthood and long-term outcomes. A study by Rao et al (1999) examined the recurrence of depression in a community sample of late-adolescent girls, but did not specifically link recurrence to later outcomes. More relevant is a recent study by Colman et al (2007), which found that individuals who reported an internalising disorder at ages 13 and 15 years were more likely than either mentally healthy individuals, or individuals who reported an internalising disorder at either age 13 or age 13, to report a mental disorder at ages 36, 43 or 53 years. It seems reasonable to conjecture that the long-term prognosis of recurrence and psychosocial impairment caused by adolescent and early-adult depression will increase with the increasing frequency of depression, but this remains to be demonstrated.

Against this background, we report the results of a longitudinal study of depression in adolescence and early adulthood, and subsequent outcomes. The aims of this study were to document the frequency of depressive episodes during later adolescence and early adulthood (ages 16–21 years); to examine linkages between extent of depression in adolescence and outcomes in young adulthood (ages 21–25 years) including depression, anxiety, suicidal behaviours, educational achievement and economic circumstances; and to adjust the associations between extent of adolescent and early-adult depression and later outcomes for potentially confounding factors, including family and individual factors, and psychiatric disorders co-occurring with major depression in adolescence. More generally, the aims of the study were to document the extent to which the frequency of depressive episodes in adolescence and early adulthood was associated with longer-term psychiatric morbidity and life-course adversity.

METHOD

Participants The data were gathered during the course of the Christchurch Health and Development Study. In this study a birth cohort of 1265 children (635 boys, 630 girls) born in the Christchurch (New Zealand) urban region in mid-1977 has been studied at birth, 4 months, 1 year and annually to age 16 years, and again at ages 18, 21 and 25 years (Fergusson et al, 1989; Fergusson & Horwood, 2001). All study information was collected on the basis of
signed and informed consent from study participants.

**Episodes of major depression at ages 16–21 years**

At ages 18 and 21 years, study participants underwent a structured mental health interview designed to assess aspects of mental health and psychosocial adjustment since the previous assessment. All interviews were conducted in private by trained lay interviewers at a location convenient to the respondent, with the interviewer unaware of the previous assessments of the cohort member. As part of the mental health assessment at each age, components of the Composite International Diagnostic Interview (CIDI; World Health Organization, 1993) were used to assess DSM-IV symptom criteria for a range of disorders including major depression (American Psychiatric Association, 1994). Participants were questioned about symptoms of major depression occurring in the past month, the past 12 months and the period following the previous assessment, as well as any associated impairment of functioning. In doing so, participants were asked to base their answers on an index episode of depression occurring during the specified period. Those meeting diagnostic criteria for an episode of major depression during any interval were further questioned about the number of depressive episodes like the index episode they had experienced during the period since the previous interview. For the purposes of the present analysis, these report data were summed over the period from age 16 to age 21 years to provide an estimate of the total number of depressive episodes experienced during this interval.

**Mental health outcomes at ages 21–25 years**

At age 25 years, cohort members were administered a comprehensive interview designed to assess aspects of mental health and psychosocial adjustment over the period since the previous assessment at age 21 years. As part of this interview, components of the CIDI were used to assess DSM-IV symptom criteria for major depression and anxiety disorders (including generalised anxiety disorder, specific phobia, social phobia, agoraphobia and panic disorder). For the purposes of this analysis participants were classified as having major depression if they met DSM-IV diagnostic criteria for a major depressive episode at any time between the ages of 21 and 25 years, independently of any earlier assessments. Similarly, participants were classified as having anxiety disorder if they met criteria for any anxiety disorder during this period. On the basis of this questioning, 21.6% of the cohort met diagnostic criteria for major depression and 18.2% met criteria for anxiety disorder during the period 21–25 years of age. These prevalence estimates appear to be consistent with those from a similar birth cohort being studied in the Dunedin Multidisciplinary Health and Development Study. In the Dunedin study estimates of the 12-month point prevalence of major depression in young adulthood were in the region of 17%, and for anxiety disorder ranged between 18% and 24% (Jaffee et al., 2002; Ferguson et al., 2004).

Suicidal behaviour during the period 21–25 years of age was assessed by asking sample members whether they had ever thought about killing themselves or had attempted suicide during the assessment period, and the frequency of such thoughts or attempts. Individuals who reported having any suicidal thoughts or who reported having attempted suicide at least once in the assessment interval were classified as having suicidal ideation (12.5% of the sample at ages 21–25 years) or having attempted suicide (2.1% of the sample at ages 21–25 years).

**Education outcomes at ages 21–25 years**

At age 25 years cohort members were questioned concerning their history of enrolment in tertiary education and training and any educational or vocational qualifications obtained since age 21 years. This information was used to classify participants on two dichotomous measures of educational achievement over this interval: completion of a university degree (Bachelor level or above) or attainment of any tertiary educational or vocational qualification. On the basis of this questioning 22.2% of the sample reported completing a university degree during the period and 58.8% reported completing any tertiary educational or vocational qualification.

**Economic outcomes at ages 21–25 years**

At age 25 years sample members were questioned about their receipt of social welfare benefits since age 21 years. The percentage of cohort members who reported receiving unemployment benefit, domestic purposes benefit (available to single parents with dependent children) or sickness or invalid benefit at any point in this period served as the outcome measure (34.4% of the sample). In addition, participants were questioned as to the extent of any period of unemployment since age 21 years. Participants who reported at least 1 month of unemployment during this period were classified as having been unemployed (27.1% of the sample). Sample members were also asked to estimate their personal gross income from all sources over the previous 12 months. This estimate served as the measure of personal income (in New Zealand dollars) at age 25 years (mean NZS$31,391, s.d. = 20,177).

**Covariate factors**

A wide array of social, family and individual factors available from the study database were considered for inclusion as covariates in the analysis. The following covariate factors were selected on the basis that they were significantly associated with the frequency of major depressive episodes between ages 16 and 21 years, and were found in preliminary analyses to act as a significant confounder of the association between number of depressive episodes and at least one outcome measure. These covariate factors included the following.

**Family living standards**

A measure of family material living standards from birth to age 10 years was obtained using a global assessment made by interviewer rating. Ratings were made on a five-point scale ranging from 1 (very good) to 5 (very poor). These ratings were summed over the 10-year period and divided by 10 to give a measure of typical family living standards during this period.

**Change of parents**

At each assessment from birth to age 15 years, comprehensive information was gathered on changes in the child’s family situation since the previous assessment. Using this information an overall measure of family instability was constructed on the basis of a count of the number of changes of parent experienced by the child up to age 15 years. Changes of parent included all changes resulting from parental separation or divorce, reconciliation,
remarriage, death of a parent, fostering and other changes of custodial parents.

**Exposure to childhood physical punishment**

At ages 18 and 21 years sample members were asked to describe the extent to which their parents used physical punishment during childhood (<16 years) (Fergusson & Lynskey, 1997). Separate questioning was conducted for mothers and fathers. This information was used to create a four-level scale reflecting the most severe form of physical punishment reported for either parent: parents never used physical punishment; parents rarely used physical punishment; at least one parent used physical punishment on a regular basis; at least one parent used physical punishment too often or too severely, or treated the respondent in a harsh or abusive manner.

**Exposure to childhood sexual abuse**

Also at ages 18 and 21 years, sample members were questioned about their experience of sexual abuse during childhood (<16 years) (Fergusson et al., 1996). Questioning spanned an array of abusive experiences from episodes involving non-contact abuse (e.g. inadvertent exposure) to episodes involving attempted or completed intercourse. Sample members who reported an abusive episode were then questioned further about the nature and context of the abuse. Using this information a four-level scale was devised reflecting the most extreme form of sexual abuse reported by the young person at either age: no sexual abuse; non-contact abuse only; contact sexual abuse not involving attempted or completed intercourse; attempted/completed oral, anal or vaginal intercourse.

**Gender**

Gender was recorded at birth.

**Parental attachment**

Attachment to parents was assessed using the scale developed by Armsden & Greenberg (1987) and administered when sample members were aged 15 years. The full parental attachment scale was used in this analysis ($\alpha=0.87$).

**Neuroticism**

Neuroticism was assessed using a short-form version of the neuroticism scale of the Eysenck Personality Inventory (Eysenck & Eysenck, 1964), administered when cohort members were 14 years old ($\alpha=0.80$).

**Self-esteem**

Self-esteem was assessed at age 15 years using the global measure from the Coopersmith Self Esteem Inventory (Coopersmith, 1981). The global measure of self-esteem was obtained by summing the four sub-scale scores (general, academic, social and home; full scale $\alpha=0.87$).

**Association with deviant peers**

At age 14 years sample members and their parents were questioned as to the extent to which the young person’s friends were involved in a range of behaviours, including the use of tobacco, alcohol or illicit drugs or substances, criminal offending and related behaviours. Most of the items were based on custom-written survey questions, but several of the parental items were based on items from the Revised Behavior Problem Checklist (Quay & Peterson, 1987). Six self-report and eight parental report items were summed to generate the measure of total deviant peer affiliation ($\alpha=0.76$).

**Co-occurring psychiatric disorders**

As part of the mental health interviews at ages 18 and 21 years, participants were also assessed on DSM–IV symptom criteria for a range of other psychiatric disorders occurring over the intervals 16–18 years and 18–21 years respectively, including anxiety disorders (generalised anxiety disorder, social phobia, specific phobia, agoraphobia and panic disorders), alcohol and illicit drug dependence, conduct disorder and antisocial personality disorder. The assessment of anxiety disorders and the measures of substance dependence were based on the relevant items from the CIDI. The assessment of conduct disorder was based upon items from the Self Report Delinquency Inventory (SRIDI; Elliott & Huizinga, 1989). At age 21 years this questioning was supplemented by additional items written especially for the survey to assess diagnostic criteria for antisocial personality disorder. The diagnostic information was combined over the two assessment periods to obtain the following measures of psychiatric disorder occurring during the age interval 16–21 years. A measure of the extent of anxiety disorders was based upon a count of the number of different anxiety disorders for which the participant met diagnostic criteria at any time during this period. Participants who met diagnostic criteria for alcohol dependence or illicit drug dependence at either assessment were classified as having alcohol dependence (9.4% of the sample) or illicit drug dependence (9.9% of the sample) respectively. Similarly, participants who met criteria for conduct disorder or antisocial personality disorder at either assessment were classified on a combined measure of conduct and antisocial personality disorder (8.6% of the sample).

**Statistical analysis**

The analysis was conducted in several stages. In the first stage gender differences in the rate of depressive episodes during the period 16–21 years of age were tested for statistical significance using both the $t$-test for independent samples and the non-parametric Wilcoxon test (Hays, 1988) in order to account for the possibility that the data on depressive episodes were not normally distributed. Next, the bivariate associations between the estimated number of major depressive episodes (classified into four levels: none; one to four; five to nine; ten or more) and later outcomes were tested for significance using the Mantel–Haenszel chi-squared test of linearity (Agresti, 2002) for dichotomous outcomes (mental health, education, unemployment, welfare dependence), and one-way analysis of variance for the continuous outcome (income).

In the third stage a series of regression models were developed to compare the associations between the frequency of major depressive episodes and later outcomes before and after adjustment for family background and individual characteristic covariate factors. For dichotomous outcomes logistic regression models were fitted, whereas for income outcome least-squares linear regression models were used. In all cases the regression models were fitted using the four-level classification of number of depressive episodes described above. However, it should be noted that identical conclusions resulted when the models were fitted using a continuous count measure of number of depressive episodes. In the next step of the analyses, the covariate-adjusted regression models were extended to include the measures of co-occurring psychiatric disorders during the period 16–21 years of age.
The adjusted parameter estimates from the original fitted regression models were used to calculate estimates of effect size (odds ratios) for associations that remained significant after adjustment for confounding factors. Also, to test for gender differences in the association between number of depressive episodes and outcomes, the regression models were extended to include gender by number of depressive episodes interactions.

In order to examine the sensitivity of the analyses to the way in which the measure of number of depressive episodes had been derived, the data were re-analysed using three alternative approaches to defining the relative burden of depression during the period 16–21 years of age:
(a) a measure of the duration (in weeks) of the longest period of major depression during this period;
(b) a categorical measure of the number of times the participant reported being 'currently depressed' at the age 16, 18 and 21 years assessments, resulting in a variable with four values (0, 1, 2, 3);
(c) a categorical measure of the number of times the participant reported being depressed during the 12 months prior to the assessment at ages 16, 18 and 21 years, again resulting in a variable with four values (0, 1, 2, 3).

Sample size and sample bias
The analyses presented here are based on the sample of 982 study participants who were interviewed on measures of major depression at ages 18 and 21 years. This sample represented 78% of the initial cohort of 1265 participants enrolled in the study. To examine the effects of sample losses on its representativeness, the obtained sample was compared with the remaining sample members on a series of socio-demographic measures collected at birth. This analysis suggested that there were statistically significant ($P<0.01$) tendencies for the obtained sample to underrepresent individuals from disadvantaged backgrounds, characterised by low parental education, low socio-economic status and single parenthood. To address this issue, the data weighting methods described by Carlin et al. (1999) were used to examine the possible implications of selection effects arising from the pattern of missing data. These analyses produced essentially the same pattern of results to those reported here, suggesting that the conclusions of this study were unlikely to have been influenced by selection bias.

In addition, it could be argued that the conclusions of this study might have been influenced by the fact that individuals who were depressed during adolescence and early adulthood might have been more likely to withdraw from the study. To address this issue, scores on the number of depressive episodes measure (ages 16–21 years) were compared between those who completed the mental health items in the age 25 years assessment, and those who did not complete these items at age 25 years. The results of this analysis suggested that there was no difference between the groups in terms of the number of depressive episodes experienced between ages 16 and 21 years ($P>0.80$) and that the conclusions of this study were unlikely to have been influenced by non-random sample loss due to depression.

RESULTS

Frequency of depressive episodes
Overall, 35.1% of the cohort met criteria for major depression on at least one occasion during the age period 16–21 years, and 3.9% reported ten or more episodes (Table 1). Female participants had a significantly and substantially higher rate of episodes than males (204.8 per 100 $v.$ 100.4 per 100; $P<0.0001$). The gender difference proved statistically significant using either the $t$-test or the non-parametric Wilcoxon test.

Depression in adolescence and early adulthood and subsequent outcomes
Table 2 shows the sample classified into four groups representing the number of depressive episodes in adolescence and early adulthood. This classification is related to a series of outcomes (mental health, education and economic) observed over the period from age 21 to age 25 years. An increasing number of depressive episodes from ages 16 to 21 years was significantly associated with higher rates of adverse mental health outcomes at ages 21–25 years, including major depression ($P<0.0001$), anxiety disorder ($P<0.0001$), suicidal ideation ($P<0.0001$) and suicide attempt ($P<0.0001$). Increasing frequency of depression at ages 21–25 was significantly associated with declining education and economic outcomes at ages 21–25 years, including lower rates of degree attainment ($P<0.05$), lower rates of any tertiary qualification attainment ($P<0.05$), being welfare-dependent ($P<0.0001$), being unemployed ($P<0.001$), and income at age 25 years ($P<0.01$). These findings suggest that increasing number of depressive episodes from ages 16 to 21 was associated with poorer mental health, educational and economic outcomes at ages 21–25 years.

Adjustment for confounding factors
A possible limitation on the results in Table 2 is that the apparent associations between frequency of depression in adolescence and early adulthood and later outcomes could be due to third or confounding factors that were related to both adolescent and early adult depression and later outcomes. To address this issue, the results in Table 2 were adjusted for a series of confounding factors using logistic and least-squares regression. The adjustment for confounding factors was performed in two steps: first, the findings were adjusted for family background and individual factors up to age 16 years. These confounding factors included family living standards (ages 0–10 years); the number of family changes to age 15 years; exposure to childhood physical abuse; exposure to childhood sexual abuse; gender; parental attachment at age 14 years; neuroticism at age 14 years; self-esteem at age 15 years; and deviant peer affiliation at age 14 years. In the second step the regression models were extended in order to adjust for the presence of co-occurring mental disorders between the ages of 16 and 21 years, including alcohol

<table>
<thead>
<tr>
<th>Number of episodes</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>75.4</td>
<td>54.8</td>
<td>64.9</td>
</tr>
<tr>
<td>1–4</td>
<td>18.5</td>
<td>31.7</td>
<td>25.3</td>
</tr>
<tr>
<td>5–9</td>
<td>2.1</td>
<td>8.8</td>
<td>6.0</td>
</tr>
<tr>
<td>10+</td>
<td>2.9</td>
<td>4.8</td>
<td>3.9</td>
</tr>
<tr>
<td>Mean rate of episodes per 100</td>
<td>100.4</td>
<td>204.8</td>
<td>153.8</td>
</tr>
</tbody>
</table>

1. Significance: $t$-test for independent samples and Wilcoxon test, $P<0.0001$. 

Table 2: Frequency of major depressive episodes for male and female participants between the ages of 16 and 21 years
Table 2  Associations between estimated number of depressive episodes, age 16–21 years, and mental health, education and socio-economic outcomes, age 21–25 years

<table>
<thead>
<tr>
<th>Number of episodes (ages 16–21)</th>
<th>(n=637)</th>
<th>(n=248)</th>
<th>(n=59)</th>
<th>(n=38)</th>
<th>( \chi^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health (ages 21–25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major depression, %</td>
<td>12.6</td>
<td>33.1</td>
<td>44.6</td>
<td>54.1</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Anxiety disorder, %</td>
<td>11.5</td>
<td>24.8</td>
<td>35.7</td>
<td>37.8</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Suicidal ideation, %</td>
<td>8.3</td>
<td>17.4</td>
<td>12.5</td>
<td>32.4</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Attempted suicide, %</td>
<td>0.7</td>
<td>2.5</td>
<td>1.8</td>
<td>18.9</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Education (ages 21–25)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University degree, %</td>
<td>25.9</td>
<td>17.4</td>
<td>19.6</td>
<td>18.4</td>
<td>(&lt;0.05)</td>
</tr>
<tr>
<td>Any tertiary qualification, %</td>
<td>60.6</td>
<td>57.9</td>
<td>57.1</td>
<td>40.5</td>
<td>(&lt;0.05)</td>
</tr>
<tr>
<td>Economic outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welfare-dependent, ever (ages 21–25), %</td>
<td>28.4</td>
<td>40.1</td>
<td>44.6</td>
<td>70.3</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Unemployed, 1 month or longer (ages 21–25)</td>
<td>23.1</td>
<td>30.6</td>
<td>34.6</td>
<td>40.5</td>
<td>(&lt;0.0001)</td>
</tr>
<tr>
<td>Personal income (age 25), NZ$000: mean (s.d.)</td>
<td>33.0</td>
<td>30.3</td>
<td>25.1</td>
<td>26.7</td>
<td>(&lt;0.01)</td>
</tr>
<tr>
<td></td>
<td>(21.1)</td>
<td>(19.5)</td>
<td>(14.4)</td>
<td>(20.4)</td>
<td></td>
</tr>
</tbody>
</table>


Table 3  Associations between number of depressive episodes, age 16–21 years, and mental health, education and socio-economic outcomes, age 21–25 years, before and after adjustment for covariates

<table>
<thead>
<tr>
<th>Unadjusted</th>
<th>Adjusted for confounding factors</th>
<th>Adjusted for confounding factors and co-occurring disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>s.e.</td>
<td>( P^1 )</td>
</tr>
<tr>
<td>Mental health (ages 21–25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major depression</td>
<td>0.82</td>
<td>0.10</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>0.62</td>
<td>0.10</td>
</tr>
<tr>
<td>Suicidal ideation</td>
<td>0.51</td>
<td>0.11</td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>1.12</td>
<td>0.21</td>
</tr>
<tr>
<td>Education (ages 21–25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>University degree</td>
<td>-0.25</td>
<td>0.11</td>
</tr>
<tr>
<td>Any tertiary qualification</td>
<td>-0.18</td>
<td>0.08</td>
</tr>
<tr>
<td>Economic outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welfare-dependent, ever (ages 21–25)</td>
<td>0.50</td>
<td>0.09</td>
</tr>
<tr>
<td>Unemployed, 1 month or longer (ages 21–25)</td>
<td>0.30</td>
<td>0.09</td>
</tr>
<tr>
<td>Personal income (age 25)</td>
<td>-2.79</td>
<td>0.85</td>
</tr>
</tbody>
</table>

1. Logistic regression for dichotomous outcomes; linear regression for income.
2. Covariates: 1. family living standards ages 0–10 years; 2. family changes by age 15 years; 3. childhood physical abuse; 4. childhood sexual abuse; 5. gender; 6. parental attachment age 14; 7. neuroticism age 14 years; 8. self-esteem ages 15 years; 9. association with deviant peers age 14 years.
3. Co-occurring disorders: 10. alcohol dependence ages 16–21 years; 11. illicit drug dependence ages 16–21 years; 12. anxiety disorder ages 16–21 years; 13. conduct or antisocial personality disorder ages 16–21 years.
and gender for any of the outcomes, suggesting that the associations between frequency of depression in adolescence and early adulthood and later outcomes did not differ for male and female participants.

Overall, the findings suggest that the associations between frequency of depression in adolescence and early adulthood and later mental health and welfare dependence were robust, and could not be accounted for by the effects of confounding factors and co-occurring psychiatric disorders. However, the associations between frequency of depression in adolescence and early adulthood and later education outcomes, and between frequency of depression and unemployment and personal income, could be attributed to the influence of both co-occurring psychiatric disorders, and factors confounded with the frequency of adolescent depression.

Odds ratio estimates for outcomes

In order to illustrate the effect size of the frequency of depression in adolescence and early adulthood, Table 4 presents odds ratios for the associations between frequency of depression in adolescence and early adulthood and later mental health and welfare dependence after adjustment for covariate factors and co-occurring disorders, for those associations that remained statistically significant after adjustment. Individuals with ten or more episodes of depression in the age period 16–21 years had odds of adverse mental health outcomes at ages 21–25 years that ranged from 2.86 (95% CI 1.46–5.60) to 9.57 (95% CI 2.10–43.64) times higher than those experiencing no episode of major depression at ages 16–21 years. The analyses described above were repeated using each of these alternative variables, with the following results.

For each of the alternative depression measures, increasing burden of depression (ages 16–21 years) was associated with increasing levels of major depression, anxiety disorder, suicidal ideation and suicide attempt at ages 21–25 years (all \( P < 0.0001 \)). Also, increasing burden of major depression (ages 16–21 years) was associated with lower levels of university degree and tertiary qualification attainment (all \( P < 0.05 \)), higher levels of welfare dependence (all \( P < 0.0001 \)), higher levels of unemployment (all \( P < 0.01 \)) and lower levels of personal income (all \( P < 0.05 \)).

Adjustment for confounding factors and co-occurring disorders reduced the associations between each of the measures of depression at 16–21 years of age and later university degree and tertiary qualification attainment to statistical non-significance (all \( P < 0.20 \)). Also, adjustment for confounding factors and co-occurring disorders reduced the associations between each of the measures of depression at 16–21 years of age and later unemployment and income to statistical non-significance (all \( P > 0.20 \)).

Adjustment for confounding factors and co-occurring disorders reduced the magnitude of the association between each of the measures of depression at 16–21 years of age and later mental health disorders and welfare dependence; however, each of the associations remained statistically significant (all \( P < 0.05 \)).

The results of these analyses show a similar pattern of results to the analyses that employed the measure of number of episodes of major depression at ages 16–21 years, suggesting that the results were robust to alternative classifications of the relative burden of major depression during this age period.

### DISCUSSION

**Findings of the present study**

In this paper we have used data gathered over the course of a 25-year longitudinal study to examine the linkages between frequency of depressive episodes in adolescence and early adulthood and outcomes in young adulthood. The study led to the following conclusions.

First, the results make it clear that depression in adolescence and early adulthood is often recurrent, with 22.7% of cohort members reporting two or more episodes of major depression in the period 16–21 years of age. Furthermore, it is clear that there is a minority of young people who experience a high frequency of depressive episodes; 3.9% of the cohort reported ten or more episodes of major depression at 16–21 years of age.

Second, the findings suggest that the frequency of depression in adolescence and early adulthood was prognostic of later psychiatric and life-course outcomes, including subsequent depression, anxiety, suicidal behaviours and welfare dependence, even after controlling for confounding factors and co-occurring psychiatric

### Table 4  Estimated odds ratios between number of major depressive episodes, ages 16–21 years, and mental health, welfare dependence and unemployment, ages 21–25 years, after adjustment for confounding factors and co-occurring disorders

<table>
<thead>
<tr>
<th>Number of depressive episodes</th>
<th>0</th>
<th>1–4</th>
<th>5–9</th>
<th>10+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major depression</td>
<td>1.93 (1.55–2.40)</td>
<td>3.72 (2.40–5.77)</td>
<td>7.18 (3.72–13.87)</td>
<td></td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>1.42 (1.13–1.76)</td>
<td>2.01 (1.29–3.15)</td>
<td>2.86 (1.46–5.60)</td>
<td></td>
</tr>
<tr>
<td>Suicidal ideation</td>
<td>1.43 (1.13–1.81)</td>
<td>2.04 (1.27–3.29)</td>
<td>2.91 (1.43–5.96)</td>
<td></td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>2.12 (1.28–3.52)</td>
<td>4.51 (1.64–12.40)</td>
<td>9.57 (2.10–43.64)</td>
<td></td>
</tr>
<tr>
<td>Welfare dependence</td>
<td>1.34 (1.09–1.64)</td>
<td>1.80 (1.20–2.70)</td>
<td>2.42 (1.31–4.45)</td>
<td></td>
</tr>
</tbody>
</table>
disorders. These findings clearly suggest that for a substantial minority of this cohort, depression was a recurrent psychiatric condition that increased the risks of psychopathology and self-harm and reduced life opportunities. Odds ratio estimates suggested that individuals reporting ten or more episodes of major depression in adolescence and early adulthood had odds of later adverse mental health outcomes that were at least 2.8 times those of individuals who reported no major depression in adolescence and early adulthood. Similarly, those reporting ten or more episodes of depression in adolescence and early adulthood had odds of later welfare dependence that were 2.4 times those of individuals who reported no major depression in adolescence and early adulthood. Exceptions to these findings were that depression in adolescence and early adulthood was not associated with reduced educational achievement or income at age 25 years after adjustment for confounding. In addition, depression in adolescence and early adulthood was not associated with unemployment after adjustment for confounding factors and co-occurring disorders. Any association between depression and educational achievement, depression and unemployment, and depression and income, was explained by the effects of both a series of confounding factors that included family background and individual factors related to the experience of depressive episodes in adolescence and early adulthood, and other psychiatric disorders co-occurring with major depression in adolescence and early adulthood.

It should also be noted that the findings were robust to a series of alternative classifications of the recurrence of depression during adolescence and young adulthood. A series of analyses using alternative classifications revealed a similar pattern of results to those employing number of episodes as the depression measure. These findings imply that number of episodes of depression might serve as an ordinal measure corresponding to the relative burden of depression experienced by cohort members during adolescence and young adulthood.

Implications

The findings of this study underline the importance of developing effective methods for identifying, managing and treating depressive episodes in adolescence and early adulthood. It is well documented that major depression in adolescence and early adulthood is associated with adverse outcomes in adulthood (Kovacs et al., 1993; Lewinsohn et al., 2000; Fergusson & Woodward, 2002; Gled & Pine, 2002; Andrews & Wilding, 2004; Hysenbega et al., 2005; Colman et al., 2007). Our findings suggest that depression in adolescence and young adulthood may have an aetiological role in a range of later adverse mental health and economic outcomes. The collective findings of this study clearly indicate that, for a minority of young people, major depression will be a chronic and recurrent condition that both reduces their psychological well-being and limits their life opportunities. In addition, our findings suggest that the treatment of depression in adolescence and early adulthood might serve to reduce risks of later mental health disorders other than depression, and might also have the effect of reducing levels of welfare dependence.

Limitations

These conclusions need to be considered in the light of possible limitations of the study. First, the study was based on a specific cohort studied in a specific social context, which may limit the generalisability of the findings. Also, it is possible that the measure of frequency of major depression may be considered somewhat crude; however, this approximation would most probably lead to an attenuation of the associations between frequency of depression and later outcomes. It could be argued that the use of a more refined measure of frequency of depression would lead to stronger associations, both before and after controlling for confounding factors. In addition, it should be noted that the relatively high rates of depression observed in the study may be a consequence of the instrument used to measure depression (CIDI). Finally, it is possible that the study has undercontrolled associations between frequency of depression and later outcomes owing to the omission of relevant covariate factors. Notwithstanding these limitations, our findings clearly suggest that depression in adolescence and early adulthood is often recurrent, and may have far-reaching consequences for both psychiatric well-being and life course opportunities.

ACKNOWLEDGEMENTS

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REFERENCES


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Aggressive behaviour, victimisation and crime among severely mentally ill patients requiring hospitalisation

SHEILAGH HODGINS, JANE ALDERTON, ADRIAN CREE, ANDREW ABOUD and TIMOTHY MAK

Background  Severe mental illness is associated with increased risk of aggressive behaviour, crime and victimisation. Mental health policy does not acknowledge this evidence. The number of forensic beds has risen dramatically.

Aims  To examine the prevalence of aggressive behaviour, victimisation and criminality among people receiving in-patient treatment for severe mental illness in an inner-city area.

Method  Self-reports of aggressive behaviour and victimisation and criminal records were collected for 205 in-patients with severe mental illness.

Results  In the preceding 6 months 49% of the men and 39% of the women had engaged in aggressive behaviour and 57% of the men and 48% of the women had been victims of assault; 47% of the men and 17% of the women had been convicted of at least one violent crime.

Conclusions  Aggressive behaviour and victimisation are common among severely mentally ill people requiring hospitalisation in the inner city. Rates of violent crime are higher than in the general population.

Declaration of interests  None.

Compelling evidence has accumulated in the past 20 years indicating that people with severe mental illness – and most particularly those with schizophrenia – are at increased risk (compared with the general population) of committing violent crime (Hodgins et al, 1996). The association between schizophrenic disorder and aggressive behaviour is a robust finding: it has been reported by several independent research groups working in industrialised countries (Swanson et al, 1990; Arsenault et al, 2000; Brennan et al, 2000) and in low- to middle-income countries (Volavka et al, 1997) with distinctly different cultures, health, social service and criminal justice systems, in studies examining different cohorts and samples using various experimental designs including prospective, longitudinal investigations of birth cohorts (Tihonen et al, 1997; Arsenault et al, 2000; Brennan et al, 2000) and population cohorts (Wallace et al, 2004), follow-up studies comparing patients and their neighbours (Belfrage, 1998), random samples of incarcerated offenders (Fazel & Danesh, 2002) and complete cohorts of homicide offenders (Erb et al, 2001). These findings reflect enormous suffering for both victims and perpetrators and a significant financial burden for society. Further, evidence also shows that people with severe mental illness are more likely than others to be the victims of physical assault (Teplin et al, 2005).

As this evidence has accumulated, there have been three important developments within the UK. One, official mental health policy has remained mute on the topic and has failed to acknowledge the evidence (Department of Health, 1999; National Collaborating Centre for Mental Health, 2003). Two, the number of forensic psychiatric beds has dramatically increased (Priebe et al, 2005). Three, evidence has emerged showing that most of the patients admitted to forensic in-patient services are men with schizophrenia with long histories of treatment in general adult services and of criminality (Hodgins & Muller-Isberner, 2004; Meltzer et al, 2004). In an effort to shed light on this situation, we examined aggressive behaviour, victimisation and criminality among people with severe mental illness receiving in-patient treatment from general adult services and compared the rates with those from other samples of in-patients and out-patients with severe mental illness and general population samples.

METHOD

Between July 2004 and April 2005 we approached all patients (n=325) on general adult wards of an inner-city mental health trust which provides service to a geographic catchment area of 110,520 inhabitants, to participate in our study. Patients with the following characteristics were invited to participate: legal resident; able to communicate in English; 18–65 years old; and a principal diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, major depression or alcohol- or drug-induced psychosis. Of the 325 patients, 49 did not meet the inclusion criteria: 21 had other diagnoses, 18 were not UK residents, 8 were too old or too young and 2 were mute. Of the remaining 276 patients, 21 (7.6%) were discharged before they could be invited to participate, 30 (18.1%) refused to participate and 205 consented. All 205 completed an interview, authorised their key worker to provide information about them, and authorised access to their medical and criminal records. Each patient was counted only once.

The research team arranged with each ward to assess all patients during a 2-week period. Upon arrival on the ward, the team made a census of the patients. All patients meeting the eligibility criteria were invited to participate. If the patient consented, researchers read the patient’s file, conducted the interview with the patient and then interviewed the key worker. Patients too ill to consent were contacted when symptoms had remitted. Family members were contacted, most often by telephone, and if they agreed, the interview was completed. It quickly became apparent, however, that the majority of patients did not know how to contact their parents or elder siblings. Only two-thirds of the patients named an individual who they thought could provide information about them.
when they were children, and in only a fifth of cases was such a person found and interviewed. For another quarter of the patients a collateral was interviewed about the patient’s aggressive behaviour and victimisation during the 6 months prior to the interview. Information was subsequently extracted from psychiatric and criminal records.

Socio-demographic information was collected from patients and files. Histories of psychiatric treatment were documented from medical files. The interview with the patient included two modules (Conduct Disorder and Antisocial Personality Disorder) of the Structured Clinical Interview for DSM–IV (First et al., 1996), and self-reports of aggressive behaviour using the MacArthur Community Violence Interview (Steadman et al., 1998) and of substance misuse using the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993) and the Drug Use Disorders Identification Test (DUDIT; Berman et al., 2005). Interviews also included measures of needs and insight not discussed in this report. Interviews were conducted by a consultant forensic psychiatrist, a specialist registrar in forensic psychiatry and two research workers with MSc degrees, one in psychology and one in criminology. Interviewers were trained to use each instrument.

As recommended, alcohol misuse was defined as an AUDIT score of 8 for men and 6 for women, alcohol dependence as an AUDIT score of 16, drug misuse as a DUDIT score of 6 for men and 2 for women, and drug dependence as a DUDIT score of 25 for men and 2 for women (Saunders et al., 1993; Berman et al., 2005).

Serious assaults over the life span were defined as killing someone; injuring someone so seriously that the person required in-patient hospital care; or using a gun, knife or other object to injure someone. Any aggressive behaviour in the past 6 months was defined as throwing an object at someone; pushing, shoving, grabbing, slapping, kicking, biting, choking or hitting someone; trying to physically force someone to have sexual relations against his or her will; threatening someone with a knife, gun or other weapon; and any other violent act towards another person as reported by either the participant and/or the collateral. Serious violence in the past 6 months was defined as forcing someone to have sexual relations against his or her will; threatening someone with a weapon; using a gun or knife to injure someone; or inflicting any injury on another person. Victimisation was defined as being a victim of any of the aggressive behaviours described above.

Criminal records were obtained from the Home Office Offenders Index and from the Police National Computer database. If an offence was recorded in only one of the databases, it was counted as an offence. Violent crimes were defined as crimes included in the Offenders Index categories ‘violence against the person’, ‘sexual offences’ minus prostitution-related offences, and ‘robbery’. All other crimes were defined as non-violent.

RESULTS

The characteristics of the participants are presented in Table 1. The patients were in their late thirties and more than a quarter of them had been born outside the UK. They were poorly educated. Almost half lived in their own homes and 14% of the

<table>
<thead>
<tr>
<th>Table I Characteristics of the patients</th>
<th>Men (n=120)</th>
<th>Women (n=85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years: mean (s.d.)</td>
<td>37.2 (11.4)</td>
<td>40.1 (13.3)</td>
</tr>
<tr>
<td>Born outside the UK, % (n)</td>
<td>25 (30)</td>
<td>33 (28)</td>
</tr>
<tr>
<td>Education, % (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GCSE</td>
<td>42 (50)</td>
<td>29 (25)</td>
</tr>
<tr>
<td>A-level or above</td>
<td>23 (28)</td>
<td>40 (34)</td>
</tr>
<tr>
<td>Accommodation, % (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own home</td>
<td>49 (58)</td>
<td>59 (50)</td>
</tr>
<tr>
<td>Hostel</td>
<td>14 (17)</td>
<td>7 (6)</td>
</tr>
<tr>
<td>Parents’ home</td>
<td>11 (13)</td>
<td>8 (7)</td>
</tr>
<tr>
<td>Homeless</td>
<td>14 (17)</td>
<td>8 (7)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (14)</td>
<td>18 (15)</td>
</tr>
<tr>
<td>Have children, % (n)</td>
<td>36 (43)</td>
<td>46 (39)</td>
</tr>
<tr>
<td>Parents and/or siblings with</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental illness, % (n)</td>
<td>31 (37)</td>
<td>40 (33)</td>
</tr>
<tr>
<td>At least one criminal conviction, % (n)</td>
<td>23 (28)</td>
<td>16 (13)</td>
</tr>
<tr>
<td>Principal diagnosis, % (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>77 (92)</td>
<td>48 (41)</td>
</tr>
<tr>
<td>Schizoaffective disorder</td>
<td>6 (7)</td>
<td>13 (11)</td>
</tr>
<tr>
<td>Bipolar disorder</td>
<td>13 (15)</td>
<td>27 (23)</td>
</tr>
<tr>
<td>Depression</td>
<td>4 (5)</td>
<td>5 (4)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (1)</td>
<td>7 (6)</td>
</tr>
<tr>
<td>Substance misuse, % (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No substance misuse</td>
<td>43 (44)</td>
<td>46 (39)</td>
</tr>
<tr>
<td>Alcohol misuse</td>
<td>31 (32)</td>
<td>38 (32)</td>
</tr>
<tr>
<td>Alcohol dependence</td>
<td>15 (15)</td>
<td>11 (9)</td>
</tr>
<tr>
<td>Drug misuse</td>
<td>49 (50)</td>
<td>39 (33)</td>
</tr>
<tr>
<td>Drug dependence</td>
<td>13 (13)</td>
<td>11 (9)</td>
</tr>
<tr>
<td>Prior in-patient treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients for whom this was the first admission, % (n)</td>
<td>18 (13)</td>
<td>15 (8)</td>
</tr>
<tr>
<td>Length of in-patient stay prior to interview, days: mean (s.d.)</td>
<td>113.6 (144.6)</td>
<td>116.6 (184.3)</td>
</tr>
<tr>
<td>Legal status at admission, % (n)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involuntary admission</td>
<td>63 (70)</td>
<td>57 (45)</td>
</tr>
<tr>
<td>Civil sections</td>
<td>54 (60)</td>
<td>47 (37)</td>
</tr>
<tr>
<td>Forensic section</td>
<td>6 (7)</td>
<td>5 (4)</td>
</tr>
<tr>
<td>Police section</td>
<td>3 (3)</td>
<td>5 (4)</td>
</tr>
</tbody>
</table>

GCSE, General Certificate of Secondary Education.

1. Data missing for some patients, especially with regard to substance misuse, prior in-patient treatment and legal status at admission.
men and 8% of the women were homeless. More than three-quarters of the men had a principal diagnosis of schizophrenia, whereas this was true of only 48% of the women. Only 43% of the men and 46% of the women did not misuse or abuse alcohol and/or illicit drugs. Most of the patients had a history of previous admissions. The current admission was involuntary for 63% of the men and 57% of the women. The average length of time on the ward prior to interview was 4 months.

Aggressive behaviour and victimisation

Aggressive behaviour towards others, victimisation and criminality were common and characterised more of the men than the women (Table 2). The risk of victimisation in the prior 6 months was increased (OR=6.57, 95% CI 3.51–12.28) by having engaged in aggressive behaviour in the same period. Foreign-born patients were no more likely than those born in the UK to have committed assaults, to have been the victim of assaults or to have a record of any crime, non-violent crime or violent crime.

The prevalence of aggressive behaviour in this sample was compared with that documented for other samples of patients in studies using the same instrument and procedure to report on aggressive behaviour. The Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) were conducted at 56 sites across the USA and included 1410 participants receiving outpatient treatment for schizophrenia who had experienced at least one prior episode (Swanson et al, 2006). Compared with our UK in-patient sample, the participants in the CATIE study were similar in age (mean 40.5 years), more were living independently (77.6%), fewer were homeless (3.8%), many more had completed high

### Table 2 Violent acts, victimisation and criminal offending

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engaged in at least one serious assault over lifetime, % (n)</td>
<td>42 (50)</td>
<td>21 (18)</td>
</tr>
<tr>
<td>Engaged in at least one aggressive behaviour during past 6 months, % (n)</td>
<td>49 (59)</td>
<td>39 (33)</td>
</tr>
<tr>
<td>Engaged in at least one violent behaviour during past 6 months, % (n)</td>
<td>22 (26)</td>
<td>19 (16)</td>
</tr>
<tr>
<td>Victim of at least one aggressive behaviour during past 6 months, % (n)</td>
<td>57 (68)</td>
<td>48 (41)</td>
</tr>
<tr>
<td>Criminal record, % (n)</td>
<td>68 (82)</td>
<td>27 (23)</td>
</tr>
<tr>
<td>Conviction for a non-violent offence, % (n)</td>
<td>63 (76)</td>
<td>24 (20)</td>
</tr>
<tr>
<td>Conviction for a violent offence, % (n)</td>
<td>47 (56)</td>
<td>16 (14)</td>
</tr>
</tbody>
</table>

### Table 3 Comparisons of the prevalence of aggressive behaviour among the study sample and other samples of patients with schizophrenia or schizoaffective disorder

<table>
<thead>
<tr>
<th></th>
<th>Any aggressive behaviour&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Serious violence&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td><strong>UK urban in-patient sample</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence, %</td>
<td>51.5</td>
<td>30.8</td>
</tr>
<tr>
<td><strong>CATIE trial&lt;sup&gt;2&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence, %</td>
<td>18.5</td>
<td>21.0</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>4.40 (2.70–7.17)</td>
<td>1.47 (0.65–3.31)</td>
</tr>
<tr>
<td><strong>CSMIV general adult patients living in the community&lt;sup&gt;3&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence, %</td>
<td>12.9</td>
<td>0.0</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>7.17 (3.09–16.62)</td>
<td>NA</td>
</tr>
<tr>
<td><strong>CSMIV forensic patients living in the community&lt;sup&gt;3&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence, %</td>
<td>8.3</td>
<td>0.0</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>11.69 (5.32–25.70)</td>
<td>NA</td>
</tr>
<tr>
<td><strong>US study of general adult in-patients with schizophrenia or schizoaffective disorder&lt;sup&gt;4&lt;/sup&gt;</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence, %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In past 10 weeks</td>
<td>40.2</td>
<td>43.6</td>
</tr>
<tr>
<td>Adjusted to 26 weeks</td>
<td>73.7</td>
<td>77.4</td>
</tr>
<tr>
<td>OR (95% CI)</td>
<td>0.38 (0.20–0.72)</td>
<td>0.35 (0.17–0.66)</td>
</tr>
</tbody>
</table>

**Notes:**
2. CATIE trial (Swanson et al, 2006) only included participants with schizophrenia who had experienced more than one episode. Therefore, the comparisons were made only with patients in the present study with a diagnosis of schizophrenia and at least one prior episode (72 men and 32 women). Aggressive behaviour: 50.0% men, 28.1% women; violence: 19.4% men and 15.6% women.
3. CSMIV (2001). Rates are adjusted as participants reported on aggressive behaviours in the past 10 weeks. Comparisons were made with only the patients with schizophrenia or schizoaffective disorder in the present study (99 men and 52 women). Aggressive behaviour: 51.5% men and 30.8% women; violence: 21.2% men and 15.4% women.
4. Monahan et al (2001). The comparisons were made only with the patients with schizophrenia or schizoaffective disorder in the present study (99 men and 52 women).
The prevalence of criminal convictions noted in the Offenders Index among the UK in-patient sample compared with a general UK population sample of people born in 1953.

### Table 4: Prevalence of criminal convictions noted in the Offenders Index among the UK in-patient sample compared with a general UK population sample of people born in 1953.

<table>
<thead>
<tr>
<th>Sample size, n</th>
<th>UK in-patient sample</th>
<th>General population sample born in 1953</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Those born 1951–1955</td>
</tr>
<tr>
<td>Men</td>
<td>120</td>
<td>10</td>
</tr>
<tr>
<td>Women</td>
<td>85</td>
<td>5</td>
</tr>
</tbody>
</table>

Men with at least one conviction prior to their 46th birthday

- Prevalence, %: 57.5 vs. 80.0
- OR (95% CI): 2.80 (1.95–4.02) vs. 8.27 (1.76–38.95)

Women with at least one conviction prior to their 46th birthday

- Prevalence, %: 22.4 vs. 20.0
- OR (95% CI): 3.02 (1.81–5.04) vs. 2.62 (0.29–23.48)

### Table 5: Criminal convictions up to age 30 years: comparison of general population samples with in-patient samples with severe mental illness from three countries

<table>
<thead>
<tr>
<th>UK1</th>
<th>Sweden2</th>
<th>Denmark3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Men</td>
<td>Conviction for a criminal offence</td>
<td>2.72 (1.90–3.90)</td>
</tr>
<tr>
<td></td>
<td>Conviction for a violent criminal offence</td>
<td>4.86 (3.30–7.16)</td>
</tr>
<tr>
<td>Women</td>
<td>Conviction for a criminal offence</td>
<td>2.85 (1.63–4.98)</td>
</tr>
<tr>
<td></td>
<td>Conviction for a violent criminal offence</td>
<td>17.24 (8.18–36.32)</td>
</tr>
</tbody>
</table>

3. Hodgins et al. (1996); odds ratios were calculated from data as article presented relative risk ratios.
Crime

We compared the prevalence of offending and violent offending (as recorded in the Offenders Index) of the patients in the study with that reported for a UK general population sample born in four selected weeks in 1953 (Prime et al, 2001). We made two comparisons, one for the patient sample as a whole and another that included only those patients born in the period 1951–1955. Male patients were between three and eight times more likely to have a record of criminal convictions and four to five times more likely to have a conviction for a violent offence than the men in the general population sample. The comparison of the entire female patient sample with the women in the general population sample showed a three-fold increase in risk of criminal convictions and an eight-fold increase in violent convictions among the female patients (Table 4).

Finally, we attempted to understand whether the elevations in risks of any conviction and of violent convictions observed in the UK in-patient sample compared with the UK general population sample were similar to those observed in other studies. We examined the risks of any criminal conviction and of convictions for violence of in-patients with severe mental illness, compared with the general population where they lived, in three studies. In all three studies, official records of crime by people with severe mental illness who had been admitted to hospital at least once are compared with those of a general population sample. Our UK in-patient sample was compared with the UK general population sample of persons born in 1953 (Prime et al, 2001). The Swedish cohort included all 15 117 persons born in Stockholm in 1953 (Hodgins, 1992). The Danish cohort included all 358 000 persons born in Denmark from 1944 through 1947 (Hodgins et al, 1996). Only convictions up to age 30 years are compared (Table 5). Across the three samples and among both men and women, a two-fold increase in the odds for convictions for any criminal offence was found. Among men, an almost five-fold increase in violent convictions emerged for the UK and Swedish samples, with a much lower increase for men with severe mental illness in the Danish sample. Among women, the pattern of results across the three studies differed. For any conviction, the women with severe mental illness in the UK in-patient sample showed a smaller increase in risk compared with the general population cohort than either the Swedish or the Danish women with severe mental illness. In contrast, the women with severe mental illness in the UK sample had much higher odds of conviction for violent offences than was found for women with severe mental illness in the Swedish or Danish samples.

**DISCUSSION**

Among a sample of in-patients with severe mental illness, 49% of the men and 39% of the women had engaged in assaultive behaviours in the previous 6 months. This finding suggests that aggressive behaviour is a prevalent problem among patients with severe mental illness who require hospitalisation. The assaults took place when patients were living in the community and indicate a need for interventions designed to reduce aggressive behaviour and increase prosocial skills. Aggressive behaviour has many negative consequences, including incarceration in prisons where violence is common, increased contact with antisocial peers, and rejection by family members and friends. Further, aggressive behaviour limits the already small chances of a person with severe mental illness obtaining and maintaining employment and limits access to certain types of supported accommodation and specialised treatment services. As this study and others have shown (Walsh et al, 2003; Silver et al, 2005), aggressive behaviour is also associated with an increased risk of being the victim of an assault.

**Prevalence of aggressive behaviour towards others**

In an effort to understand whether the magnitude of the problem confronting general adult services in UK inner-city areas was comparable to that challenging psychiatric services elsewhere, we compared prevalence rates of aggressive behaviour of the UK patients with those reported for other samples of patients with severe mental illness. Patient samples were similar as to age and principal diagnosis, and the same instrument and procedure had been used to collect information on aggressive behaviour in all studies. Both men and women in this UK urban in-patient sample reported higher rates of aggressive behaviour and violence towards others than patients in the CATIE trial and than both general adult and forensic patients in the CSMIV. In contrast, when rates of aggressive behaviour among UK patients were compared with a sample of in-patients with schizophrenia and schizoaffective disorder in the USA, the prevalence of any aggressive behaviour and of violence was much lower among the UK than the US patients. It is essential to note, however, that the comparison of the two in-patient samples is based on a statistical extrapolation to make the time periods equivalent.

In the UK700 study, 22% of the patients committed an assault during a 2-year period (Walsh et al, 2001). In a study of a general UK population sample, using a similar definition of physical aggression but covering the previous 5 years, 12% of the participants reported engaging in aggressive behaviour and 4% acknowledged injuring a victim (Coid et al, 2006). Thus, the rates of aggressive behaviour for the UK in-patients were considerably higher than those for other out-patient samples and for a general population sample. We did not include a comparison group composed of healthy adults living in the same neighbourhood as the patients. In our experience it is almost impossible to recruit a comparison sample that is representative of the general population as to aggressive behaviour and criminality. This is because the most frequent offenders – young men and women with a childhood history of conduct disorder, adult antisocial personality disorder and substance misuse – are unlikely to volunteer to participate in a research study.

The patients in the CATIE trial and general adult services patients from the CSMIV were characterised by higher levels of education and lower levels of substance misuse/dependence than the UK patient sample. The higher level of substance misuse among the UK in-patient sample, however, is unlikely to explain the differences in the prevalence of aggressive behaviour. In all four samples that were used for the comparisons, it has been shown that substance misuse/dependence was not associated with aggressive behaviour after controlling for conduct problems prior to age 15 years (Hodgins et al, 2005; Swanson et al, 2006). Similarly, among the women in the UK700 study, substance misuse was not associated with violence towards others (Dean et al, 2006).

The difference in the prevalence of conduct problems prior to illness onset may, however, explain, at least in part, the differences in rates across samples. In the UK in-patient sample, 42% of the men and
22% of the women fulfilled criteria for a diagnosis of conduct disorder before the age of 15 years (further details available from the authors). These prevalence rates are higher than those reported for other samples of general adult and forensic patients with schizophrenia (Hodgins et al., 1998). In a follow-up of the Dunedin birth cohort at age 26 years, 40% of those who had developed a schizophrenic disorder displayed conduct disorder prior to mid-adolescence (Kim-Cohen et al., 2003). It is known that within the UK, rates of conduct disorder are elevated in socio-economically deprived neighbourhoods (Meltzer et al., 2000). Since among men with schizophrenia, childhood conduct disorder continues to be associated with aggressive behaviour and violent crime into middle age (Hodgins et al., 2005; Swanson et al., 2006), the elevated prevalence rate of childhood conduct disorder prior to age 15 years in the sample studied may explain, at least in part, the elevated rates of aggressive behaviour and violent crime.

To conclude, rates of aggressive behaviour of the UK in-patient sample with severe mental illness were similar to rates reported for in-patients with similar diagnoses in a US general hospital sample, and higher than rates for samples of community patients in the USA and in Europe. Rates of childhood conduct disorder and substance misuse were higher than those reported for other samples. The high rates of involuntary hospitalisation of the sample suggest that people with severe mental illness who require hospitalisation may be less cooperative and more aggressive than those who are treated at home.

Victimisation

Many of the men (57%) and the women (48%) in our study had been the victim of aggressive behaviour in the preceding 6 months. This was true of 20% of the CATIE trial participants (Swanson et al., 2006), 18% of men in the CSMIV general psychiatric sample and 12% of men in the CSMIV forensic sample. In the MacArthur study 54% of the men and 52% of the women with schizophrenia or schizoaffective disorder reported victimisation in the preceding 10 weeks (Monahan et al., 2001). Thus, the rates of victimisation in the UK sample of in-patients are higher than those reported for other samples of patients with similar diagnostic profiles who are receiving community care, but similar to those for a US sample of in-patients with similar disorders. These findings add to a growing body of evidence showing that people with severe mental illness are at increased risk of becoming victims of aggressive behaviour or of crime, after socio-demographic factors are controlled for (Walsh et al., 2003; Silver et al., 2005; Teplin et al., 2005). Rates of victimisation among people with severe mental illness vary from place to place (Honkonen et al., 2004).

In our study, engaging in aggressive behaviour significantly increased the risk of being a victim of a physical assault. Similarly, in the UK700 study, physical victimisation was found to be associated with aggressive behaviour towards others, illicit drug use, comorbid personality disorder, symptomatology, and homelessness (Walsh et al., 2003). In a study that included the entire sample of patients from the MacArthur study the association between victimisation and aggressive behaviour was again identified. In addition, living in a deprived neighbourhood contributed independently to the risk of victimisation (Silver et al., 2002). Taken together, these results suggest that certain environments foster, even teach, the use of aggressive behaviour to solve problems. Research is urgently needed to understand the link between victimisation and aggressive behaviour among people with severe mental illness and to identify the factors associated with reductions in both.

Prevalence of convictions for violent crime

In this study almost half of the men and 17% of the women had at least one conviction for a violent crime. The mental health trust studied provides services to four boroughs; in the period that patients were recruited into the study, two of these boroughs had crime rates higher than the national average and two had similar rates (Nicolas et al., 2005). In addition, these boroughs rank relatively high on a measure of social deprivation (Office of the Deputy Prime Minister, 2004). Consequently, the proportions of patients with criminal records and who experienced victimisation may be higher than in similar samples recruited from areas with lower crime rates. The patients had higher rates of convictions for any crime and for violent crimes than a UK general population sample. As presented in Table 5, this finding is consistent with the evidence that has been accumulating in the scientific literature since the early 1990s concerning the increase in risk of violent crime among patients with severe mental illness compared with the general population where they live.

Implications for services

If replicated, the results of this study indicate that general adult in-patient wards are now treating a subset of adults with severe mental illness who present multiple problems. The findings concur with a substantial body of evidence that has accumulated indicating that a subgroup of people with severe mental illness repeatedly engage in aggressive behaviour towards others while living in the community. In our view, it is time to begin building an evidence base concerning the assessment, management and treatment of this subgroup. We have developed a series of testable propositions for interventions that are briefly outlined below. The proposals are based on knowledge of aggressive individuals with schizophrenia, and of effective treatments for schizophrenia, substance misuse among people with schizophrenia, and violence.

The extant literature suggests that an integrated and coordinated package of interventions specifically targeting each of the problems is necessary in order to effect positive outcome (Hodgins & Muller-Ishberner, 2000; Mueser & McGurk, 2004). Further, evidence suggests that among those who engage in aggressive behaviour and violent crime there are distinct subgroups who require different packages of treatments. Patients with a history of conduct problems (and often crime) prior to illness onset present antisocial attitudes and ways of thinking and a lack of prosocial skills from a young age, but may be less compromised neurologically than other patients with schizophrenia (Hodgins et al., 2005; Naudts & Hodgins, 2006). These patients differ from those whose aggressive behaviour onset with illness (Mueser et al., 1999, 2006), and also from a third type who engage in no aggressive behaviour until many years after illness onset and then commit serious violence, usually against a carer (Hodgins, 2007).

We propose that general adult services assess the history of aggressive and antisocial behaviour among patients with severe mental illness. This is done relatively easily and quickly using structured interviews assessing conduct disorder. This procedure would identify the patients most likely to continue to engage in aggressive behaviour and violent crime. The routine and continued use of structured risk assessment
tools, such as the Historical, Clinical and Risk Scale (Webster et al, 1997), would provide treatment teams with targets for managing the risk of aggressive behaviour and a way to assess progress over time. However, this tool would not identify the third type of patient who apparently ‘out of the blue’ engages in serious violence. Such patients are rare, and the only available evidence suggests that they may become progressively more callous prior to engaging in violence (further details available from the authors). Naturalistic follow-up studies indicate good outcome for even high-risk patients who are treated in highly structured community programmes that manage risk continually (Heilbrun & Peters, 2000; Lamberti et al, 2004).

All three subtypes of patients require antipsychotic medication. The ‘early starters’, however, who are characterised by antisocial behaviours, attitudes and ways of thinking, present a special challenge to staff who attempt to educate them about their illness and the need for medication. Further, early-onset conduct problems are in part genetically determined (Rhee & Waldrum, 2002). The parents and siblings of men with schizophrenia and a history of childhood conduct disorder, compared with men with schizophrenia and no history of conduct problems prior to illness onset, display higher rates of crime and substance misuse (Hodgins et al, 2005; further details available from the authors), suggestive (but not proof) of a distinct genetic profile. Since response to neuroleptics is partially determined by individual genetic profiles (Illi et al, 2003), further research is needed to determine whether a better therapeutic response in this subgroup would be achieved with specific medications. One study has shown that aggressive patients with schizophrenia show greater reductions in positive and negative symptoms with clozapine, whereas patients who do not engage in aggressive behaviour benefit most from other medications (Volavka et al, 2004).

Once the optimal medication has been identified, compliance must be ensured before any other interventions are begun. Community care orders coupled with other medications (Volavka & Peters, 2000) and increased levels of psychotic symptoms and attitudes has been achieved, these patients need further learning-based programmes to reduce aggressive behaviour and substance misuse and to develop prosocial skills. Their relative cognitive proficiency makes them good candidates for employment training programmes that have proved effective with patients with schizophrenia (Cook et al, 2003; McGurk et al, 2005).

Patients who began engaging in aggressive behaviour at illness onset, once compliance with medication has been achieved, the ‘early starter’ patients may benefit from a cognitive–behavioural intervention aimed at reducing antisocial behaviour, attitudes and ways of thinking. Such programmes are effective with non-mentally-ill offenders (Tong & Farrington, 2006) and are currently being evaluated in patients with severe mental illness (Fahy et al, 2004). Once a reduction in antisocial behaviours and attitudes has been achieved, these patients need further learning-based programmes to reduce aggressive behaviour and substance misuse and to develop prosocial skills. Their relative cognitive proficiency makes them good candidates for employment training programmes that have proved effective with patients with schizophrenia (Cook et al, 2003; McGurk et al, 2005).

The results of our study also show the need for general adult services to assess victimisation among patients with severe mental illness and to intervene to help patients protect themselves. A recent study reported that current victimisation contributed to substance misuse, demoralisation and increased levels of psychotic symptoms among people with severe mental illness (Shahar et al, 2004). We have found only one study assessing interventions for victimisation: adherence to treatment that resulted from community treatment orders for patients with severe mental illness was associated with a reduction in victimisation (Hiday et al, 2002).

Our findings paint a dramatically different picture of the problems presented by people with severe mental illness from that in the National Service Framework for Mental Health (Department of Health, 1999) or the National Institute for Health and Clinical Excellence clinical guidelines for schizophrenia (National Collaborating Centre for Mental Health, 2003). Both policy and practice currently fail to recognised that aggressive behaviour and victimisation are problems for many patients with severe mental illness. Consequently, general adult services are not given sufficient resources to treat these problems, and increasing numbers of patients are transferred to expensive forensic services.

REFERENCES


victimization of people with severe mental illness. American Journal of Psychiatry 159: 1403–1411


Chocolate craving when depressed:
a personality marker

GORDON PARKER and JOANNA CRAWFORD

Summary We examined links between chocolate craving in people who are depressed and both personality style and atypical depressive symptoms, with a web-based questionnaire completed by nearly 3000 individuals reporting clinical depression. Chocolate was craved by half of the respondents (more so by women), judged as beneficial for depression, anxiety and irritability, and associated specifically with personality facets encompassed by the higher-order construct of neuroticism. The simple question of depression-associated chocolate craving appeared an efficient discriminator of DSM–IV atypical depression symptoms.

Declaration of interest None.

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METHOD

People accessing – for whatever reason – our mood disorder consumer information website (http://www.blackdoginstitute.org.au) were invited to participate in an online survey involving questions on chocolate consumption. Participants provided demographic data, reported symptoms and treatments of depressive episodes, and rated any increase in 35 symptoms or coping responses, degree of increased food cravings and importance of chocolate when depressed. All completed the tiered Temperament and Personality questionnaire (Parker et al, 2006b), assessing personality constructs dispositions to depression from higher-order constructs (e.g. ‘neuroticism’ and ‘extraversion’) to eight lower-order facets. As participants were recruited anonymously, no data validity check was possible.

Sample Analyses were limited to 2692 of the 3486 respondents who were 18 years or older, living in Australia, initial survey completers, and reported depressive episodes lasting 2 weeks or longer. Their mean age was 40.0 years (range 18–77) and 70.8% were female; 73.6% had previously received an antidepressant medication and 78.3% had received counselling or psychotherapy for depressive episodes.

RESULTS

When depressed, 1465 (54.4%) reported food cravings, with 1210 (44.9%) specifically being chocolate cravers (50.7% of the women and 30.9% of the men; χ²=88.3, P<0.001). Only 9.5% acknowledged alternative craved foods. Of the chocolate craver group, the 736 (60.8%) who rated chocolate’s capacity to improve their depressed mood as moderately to very important were more likely to rate it as making them feel significantly (P<0.001) less anxious (χ²=366.7) and less irritated (χ²=337.1).

Temperament and Personality questionnaire scores quantified the chocolate cravers group as having significantly (P<0.001) higher mean scores on the irritability (t=6.3), rejection sensitivity (t=5.6), anxious worrying (t=5.3), self-criticism (t=5.2) and self-focused (t=4.5) scales, all derived from the higher-order neuroticism construct. Differences were not evident on scales originating from the higher-order introversion construct, i.e. personal reserve (t=1.8), social avoidance (t=1.1) and perfectionism (t=0.5). This differential finding was confirmed by this group scoring higher on the consolidated tier 2 higher-order neuroticism scale (16.8 v. 15.4, t=6.5, P<0.001) but not on the tier 2 introversion scale (12.3 v. 11.8, t=0.8, P=0.075). A logistic regression (entering all eight personality constructs as predictors of chocolate craving status) identified irritability along with rejection sensitivity as the only two significant predictors.

Examined against DSM–IV criterion B atypical depression accessory symptoms, those identified as chocolate cravers returned higher (P<0.01) scores for appetite increase (t=21.8), weight gain (t=18.8), sensitivity to rejection (t=7.3), hypersomnia (t=5.7) and limbs feeling ‘heavy like lead’ (t=5.4).

We explored the hypothesis that atypical depression symptoms have a self-comforting

Table I Mean ratings of ‘self-soothing’ tendencies among those endorsing differing numbers of atypical symptoms when depressed

<table>
<thead>
<tr>
<th>Number of atypical symptoms: mean (s.d.)</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (n=217)</td>
<td>351</td>
<td></td>
</tr>
<tr>
<td>1 (n=563)</td>
<td>214</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>2 (n=658)</td>
<td>3.5</td>
<td>0.8</td>
</tr>
<tr>
<td>3 (n=607)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4 (n=647)</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td>5 (n=217)</td>
<td>2.4</td>
<td>1.2</td>
</tr>
<tr>
<td>6 (n=217)</td>
<td>2.2</td>
<td>1.2</td>
</tr>
<tr>
<td>7 (n=217)</td>
<td>2.0</td>
<td>1.1</td>
</tr>
<tr>
<td>8 (n=217)</td>
<td>1.9</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Cravings for ‘comfort’ food, e.g. chocolate, cake

| Cravings for ‘comfort’ food, e.g. chocolate, cake | 1.5 (0.8) | 1.7 (0.9) | 1.9 (1.0) | 2.5 (1.1) | 3.1 (1.0) | 3.5 (0.8) | 211.4 <0.001 |

‘Warming up’ behaviours, e.g. hot baths

| ‘Warming up’ behaviours, e.g. hot baths | 1.5 (0.8) | 1.7 (0.9) | 1.9 (1.1) | 2.0 (1.1) | 2.2 (1.2) | 2.4 (1.2) | 24.4 <0.001 |
role. Scores on two self-comforting items (craving 'comfort' foods, and 'warming up' behaviours such as having a hot bath) increased significantly (Table 1) and linearly (F=999.2 and F=119.7 respectively; P < 0.001) with increasing number of DSM-IV accessory atypical depressive symptoms, suggesting that chocolate craving might predict atypical depression status. We therefore examined the sensitivity, specificity and overall classification rate of chocolate craving predicting numbers of atypical symptoms. Sensitivity was highest (at 76.4%) for those reporting five symptoms of atypical depression, but specificity was only 57.7%. The overall classification rates were 49.2% (for a cut-off of one or more symptoms) and 57.7% (for two or more symptoms), 65.3% (for three or more symptoms), 65.0% (for four or more symptoms) and 39.2% for all five symptoms. Thus, for three or more and four or more symptoms, the probe question successfully allocated two-thirds of all participants.

**DISCUSSION**

Although our data were derived from a web-based survey, respondents were required to have experienced depressive episodes lasting at least 2 weeks and requiring treatment. Chocolate craving was common (45%) – and more likely in women – and a preferential choice (with only 10% nominating any alternative craved food). 'Importance' ratings indicated that those classed as 'depressed cravers' viewed chocolate as settling anxiety and irritability. Our most intriguing finding was the specificity of the links between chocolate craving and personality styles. We anticipated that the 'depressed cravers' group would score preferentially on the rejection sensitivity scale in light of the DSM-IV definition of atypical depression. In fact they scored higher on all five lower-order scales emerging from a higher-order 'neuroticism' base, but on none of the three personality scales emerging from a higher-order ‘introversion’ base. Our logistic regression (entering all eight personality constructs) identified only irritability and rejection sensitivity as significant predictors of such craving, consistent with these individuals judging chocolate as reducing anxiety and irritability.

In states of emotional dysregulation, individuals may call on a range of perceived settling or soothing coping repertoires. Although depression-related chocolate craving is likely to reflect many factors, we suggest that such cravings may reflect biological processes with homeostatic potential to redress emotional dysregulation.

Eysenck (1967) argued for a two-factor (neuroticism v. introversion) model of personality, defining neuroticism in terms of limbic activation, with high scorers prone to intense autonomic disturbances. Limbic structures such as the amygdala regulate emotion, with Canli et al (2001) demonstrating that higher neuroticism scores correlated with left temporal and frontal region activation following negative stimulus. Gender differences in brain activation have also been demonstrated, with George et al (1996) examining self-induced mood induction, and showing (using positron emission tomographic scanning) that women had differentially increased blood flow in limbic and paralimbic structures.

We have previously overviewed chocolate’s mood state effects (Parker et al, 2006a), noting its many psychoactive ingredients, including several biogenic stimulant amines, two analogues of anandamide (producing effects akin to cannabinoid-inducing euphoria) and interactions with several neurotransmitter systems (e.g. dopamine, serotonin and endorphins). We noted studies suggesting that carbohydrate craving was more closely linked to the opioid rather than to the serotonergic system, with endorphins alleviating dysphoria – although Moller (1992) has argued the role of increased serotonergic activity. Thus, chocolate cravings may advance biological mechanisms potentially settling limbic cortex-mediated activation.

Atypical depression has been variably interpreted over time (Parker et al, 2002), and its key features (e.g. hyperphagia, hyper insomnia) are not restricted to DSM-IV defined atypical depression and are quite common in type II bipolar disorder. To the extent that our methodology made our sample more likely to include those with an atypical depressive disorder (rather than atypical features), some observations are worth noting. We have previously argued (Parker et al, 2002) for the primacy of personality style (as against the DSM-IV mandatory criterion A feature of ‘mood reactivity’ – defined as capacity to be cheered up by positive events), with current analyses arguing the relevance of neuroticism or emotional dysregulation as capturing the personality domain. Our chocolate cravers group scored higher on all DSM-IV criterion B accessary features and (most predictably), hyperphagia. Study analyses indicated that the simple question of whether chocolate is craved when depressed had high utility in classifying the likelihood of an atypical depressive syndrome.

Results suggest that personality style dictates the craving for chocolate in states of emotional dysregulation (i.e. anxious and irritable, and not only depressed). As individuals with certain personality styles find such comfort eating beneficial, such behaviours may reflect biological homeostatic mechanisms operating to promote soothing of their personality-based capacity to experience emotional dysregulation.

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Screening young people for obsessive–compulsive disorder

RUDOLF UHER, ISOBEL HEYMAN, CATHERINE MORTIMORE, IAN FRAMPTON and ROBERT GOODMAN

Summary

Obsessive–compulsive disorder (OCD) in young people is underrecognised and undertreated. Simple screening tools suitable for general practice and community services are needed. We created a seven-item self-report Short OCD Screener (SOCS) and administered it to young people aged 11–15 years, including 116 patients with OCD, 181 healthy community controls and 33 young people with other psychiatric diagnoses. The SOCS has excellent sensitivity of 0.97 (95% CI 0.91–0.98) to detect OCD cases. Its specificity is good in children without psychiatric diagnoses, but low in a psychiatric sample. The SOCS is a screening tool suitable for community but not specialist settings.

Declaration of interest

None.

Obsessive–compulsive disorder (OCD) commonly arises in childhood and adolescence (Heyman et al, 2001). Young people with the disorder perceive their symptoms as embarrassing and do not disclose them unless specifically asked. Therefore, OCD in this age group often remains unrecognised and untreated. The associated distress and developmental handicap are avoidable as effective treatments are available, namely cognitive–behavioural therapy with or without serotonin reuptake inhibiting medication (Heyman et al, 2006). There is evidence that early detection and intervention improve outcome (Stewart et al, 2004). The National Institute for Health and Clinical Excellence (NICE) guidance on the assessment and treatment of OCD recommends routine screening of young people at risk in general practice or other settings where they may present for help (National Collaborating Centre for Mental Health, 2005). Such screening requires short, easy-to-use and widely available measures. We report on the development, validation and dissemination of such a self-report tool, the Short OCD Screener (SOCS).

METHOD

The questionnaire was developed from the five most discriminant items of the 44-item child version of the Leyton Obsessional Inventory (Berg et al, 1986). These items enquire about common symptoms including checking, touching, cleanliness/washing, repeating and exactness. Two further questions were designed to gauge the associated impairment and resistance. A three-option response format (‘no’, ‘a bit’, or ‘a lot’) was used throughout. A SOCS score is calculated by summing the scores for all seven items (‘no’, 0, ‘a bit’, 1; ‘a lot’, 2).

We administered the SOCS to 127 individuals aged 11–15 years consecutively referred to the Clinic for Obsessive–Compulsive and Related Disorders at the Michael Rutter Centre, Maudsley Hospital, London. Of the 127 referred individuals, 114 met ICD–10 diagnostic criteria for OCD (World Health Organization, 1992), established by a comprehensive psychiatric assessment and the structured Child Yale–Brown Obsessive–Compulsive Scale (CY–BOCS; Scahill et al, 1997). The remaining 13 individuals received other ICD–10 diagnoses, including anxiety disorder (n=7), conduct disorder (n=4), hyperactivity (n=3) and depression (n=3). All participants completed the SOCS prior to clinical assessment.

We further administered the SOCS to a community sample of 203 children aged 11–15 years as a part of the British nationwide pilot survey of child and adolescent mental health (Goodman, 1999). Diagnoses of ICD–10 psychiatric disorders in the community sample were established using the Development and Well-Being Assessment (Goodman et al, 2000). Two of the individuals in this sample met diagnostic criteria for OCD and 20 had other ICD–10 diagnoses including conduct disorder (n=12), anxiety disorders (n=6), hyperkinetic disorder (n=3) and depression (n=2). The clinic and community samples were combined to obtain a group of 116 cases of OCD, including 72 boys and 44 girls with mean age 13.3 years (s.d.=1.3, range 11–15), mean duration of illness 3.3 years (s.d.=2.2, range 0.5–10) and mean total CY–BOCS impairment score 23.1 (s.d.=5.0, range 15–40).

Three overlapping control groups were used. The first comparison group comprised the 181 individuals without any psychiatric diagnosis from the community sample, constituting the ‘pure healthy control’ group (mean age 13.0 years, s.d.=1.4; 98 boys). This group was used to obtain estimates of how well the SOCS can discriminate OCD cases from healthy individuals. The second control group was also drawn from the community sample and consisted of healthy individuals and those with non-OCD psychiatric diagnoses, forming a ‘mixed community control’ group of 201 with a proportion of individuals with other psychiatric diagnoses representative of the general population (mean age 13.0 years, s.d.=1.4; 111 boys). This group was used to provide more realistic estimates of discrimination in a community setting. The third control group is a ‘psychiatric control’ group, included 33 individuals with a psychiatric diagnosis other than OCD from both the community and the clinic samples (mean age 13.1 years, s.d.=1.3; 20 boys); this group was used to explore whether the SOCS could discriminate OCD from other psychiatric disorders in clinical samples.

We used receiver operating characteristics analysis to establish optimal cut-offs for screening (Fombonne, 1991). The 95% confidence intervals for proportions were calculated using the efficient score method (Newcombe, 1998).

RESULTS

The mean total SOCS scores were 9.7 (s.d.=2.2) for the OCD group, 3.0 (s.d.=2.3) for the healthy control group, 3.3 (s.d.=2.5) for the mixed community control group and 5.8 (s.d.=2.8) for the psychiatric control group. Thus an average OCD case scored 3 standard deviations above the healthy population mean and 1.5 standard deviations above the mean of psychiatric controls.
Internal consistency of the SOCS was good, with Cronbach’s α = 0.85. Item-total correlations were all above 0.4. A principal axis factor analysis clearly indicated unidimensionality with a single latent factor explaining 53% of variance and all item loadings > 0.4.

A SOCS score of 6 or more differentiated OCD cases with a sensitivity of 0.97 (95% CI 0.91–0.99). The specificity was 0.88 (95% CI 0.82–0.92) for differentiation from the healthy control group, 0.84 (95% CI 0.78–0.89) for the mixed community control group, and 0.52 (95% CI 0.34–0.69) for the psychiatric control group. Thus the screener identifies almost all true cases of OCD, approximately one in ten healthy adolescents and one in two of those with other psychiatric disorders (Table 1). In the composite sample of OCD cases and mixed community controls, the positive predictive value was 0.78 (95% CI 0.70–0.84) and the negative predictive value was 0.98 (95% CI 0.94–0.99).

**DISCUSSION**

The SOCS is shorter than other self-report tools (Bamber et al., 2002; Hudziak et al., 2006) and has comparable or better discriminant characteristics. The high sensitivity and negative predictive value make the SOCS an adequate screening tool for settings such as general practice, educational psychology, paediatric services or dermatology clinics. Because of its moderate specificity the SOCS cannot be recommended for making diagnoses in psychiatric samples.

The use of a composite sample from the general population and from referred patients allowed collection of a large sample of young people with OCD. However, this enriched sample differed from the population encountered in community practice. Obsessive–compulsive disorder was more prevalent in the study sample and more severe forms of the disorder might be over-represented. A study of young people attending primary care will be needed to establish more accurate estimates of discriminatory characteristics for this setting.

The questionnaire is available online at http://ocdyouth.iop.kcl.ac.uk/downloads/socs.pdf. We hope that this simple tool will help to implement the NICE guideline recommendation to increase the awareness and detection of OCD in young people (National Collaborating Centre for Mental Health, 2005). It is potentially suitable for use in primary care, community child health services, educational psychology or specialist medical settings where OCD is common, such as dermatology clinics (Fineberg et al., 2003). A negative result (SOCS score 5 or lower) means that OCD is unlikely. A positive result does not mean that the young person has OCD but should serve as a basis for discussion with the young person and parents, and diagnostic assessment. In our experience, young people find that completing this measure helps them with the initial stages of treatment, as it provides them with a vocabulary to use with their therapist.

**REFERENCES**


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**Table 1** Numbers of true and false positives/negatives using the cut-off score of 6 or more on the Short OCD Screener

<table>
<thead>
<tr>
<th></th>
<th>Screen positive</th>
<th>Screen negative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obsessive–compulsive disorder cases</td>
<td>112</td>
<td>4</td>
<td>116</td>
</tr>
<tr>
<td>Pure healthy controls</td>
<td>22</td>
<td>159</td>
<td>181</td>
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<tr>
<td>Mixed community controls</td>
<td>32</td>
<td>169</td>
<td>201</td>
</tr>
<tr>
<td>Psychiatric controls</td>
<td>16</td>
<td>17</td>
<td>33</td>
</tr>
</tbody>
</table>
Extracting spurious messages from noise and risk of schizophrenia-spectrum disorders in a prodromal population

RALPH E. HOFFMAN, SCOTT W. WOODS, KEITH A. HAWKINS, BRIAN PITTMAN, MAURICIO TOHEN, ADRIAN PREDA, ALAN BREIER, JILL GLIST, JEAN ADDINGTON, DIANA O. PERKINS and THOMAS H. McGlashan

Summary A tendency to extract spurious, message-like meaning from meaningless noise was assessed as a risk factor leading to schizophrenia-spectrum disorders by assessing word length of speech illusions elicited by multispeaker babble in 43 people with prodromal symptoms. These individuals were randomised to olanzapine v. placebo groups during year 1 followed by no pharmacological treatment for those with no disorder conversion during year 2. A time-dependent Cox regression analysis of conversion to schizophrenia-spectrum disorder revealed a significant interaction between condition (olanzapine v. no drug) and length of speech illusion, with the latter strongly predicting subsequent conversion during medication-free intervals but not during olanzapine treatment.

Declaration of interest This was an investigator-initiated study supported by Eli Lilly & Co. (T.H.M.). A.B. and M.T. are employed by Eli Lilly, SWW, R.E.H., T.H.M. and D.O.P. have received support from Eli Lilly previously.

Assessments of prodromal symptoms that identify individuals at high risk of conversion to psychosis – namely 25–35% within 1 year – have been reported (McGorry et al., 2002; McGlashan et al., 2006). This trial enrolled people with operationally defined syndromes prodromal for psychosis consisting of attenuated positive symptoms, or genetic risk plus deterioration (schizotypal personality disorder and/or first-degree relative with psychosis, plus recent loss of social and/or work capacity with a drop of 30 percentage points on the Global Assessment of Functioning sustained for at least 1 month). Participants, who had no prior lifetime history of a psychosis or schizophrenia diagnosis, were randomly allocated to receive either olanzapine (5–15 mg per day) or placebo for 1 year during the double-blind phase of the study. Those whose disorder did not convert to psychosis were invited to remain in the study for a second year with no pharmacological treatment. Those whose disorder converted to sustained psychosis were switched to a 6-month ‘rescue’ arm using open-label olanzapine. All participants provided written informed consent.

We focused on conversion to schizophrenia-spectrum disorder (schizophrenia or schizotypiform disorder) rather than on psychosis broadly defined, given our expectation that specific risk factors would be more likely to cluster within this more uniformly defined and stable diagnostic group (Correll et al., 2005). Diagnosis was determined using the Comprehensive Assessment of Symptoms and History (CASH; Andreasen, 1987). Out of 60 patients with prodromal symptoms enrolled in the trial, 44 were assessed using the ‘babble’ task, because some study sites did not administer the task. This subgroup included one patient exhibiting a psychotic decompensation who was not assessed diagnostically and whose data were consequently dropped from this conversion analysis. Among the remaining 43 patients, 10 experienced conversion to a schizophrenia-spectrum disorder during year 1, and 2 patients’ condition converted during year 2 to a schizophrenia-spectrum disorder following drug or placebo discontinuation.

The babble stimulus derived from overlapping recordings of six speakers (three women, three men) reading neutral texts. Two different speech segments from each speaker were mixed, yielding 12 simultaneous streams of speech heard binaurally using headphones. This verbal stimulus was designed to produce a high density of phonetic information rendering corresponding words virtually undetectable. Stimulus duration was 2 min 33 s. Participants were instructed to repeat any words or phrases that they ‘heard’ while listening to the babble. Only four words (‘increase’, ‘children’, ‘A–OK’, and ‘Republican’) were consistently reproduced across participants in this task. Tape-recordings of responses were transcribed for analysis. The longest phrase generated (counted as the number of words) constituted the length of speech illusion (LSI) score. Interrater reliability for this measure was high (R2=0.98). Examples of responses are given below:

- ‘another . . . the children’ (LSI=2; placebo group member, no conversion);
- ‘bombing . . . the administration . . . seem to be having trouble . . . the ball . . . the republicans . . . it’s important to . . . the ball . . . practice dancing . . .’ (LSI=5; placebo group member, conversion).

The babble task was administered as part of a neuropsychological battery administered...
at baseline, 6 months and 1 year. Analyses of other neuropsychological test data were exploratory and hypothesis-generating. Patients also received serial clinical assessments using the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987).

RESULTS

In order to undertake a time-dependent assessment of conversion risk, data for the year 1 placebo and year 2 drug discontinuation phases of the study were analysed together as a single ‘no drug’ condition that was compared with the olanzapine condition using a Cox regression analysis. Overall, the association between LSI and subsequent conversion risk was non-significant (hazard ratio (HR) 1.28, 95% CI 0.93–1.75, P = 0.13). However, the interaction between LSI and condition was statistically significant (HR = 0.51, 95% CI 0.27–0.95, P = 0.035). For the no-drug condition alone, LSI was robustly associated with subsequent conversion (HR = 1.78, 95% CI 1.26–2.53, P = 0.0011), whereas for the olanzapine condition this association was absent (HR = 0.92, 95% CI 0.55–1.55, P = 0.75). An identical time-dependence analysis of concurrent composite PANSS positive, negative and general psychopathology symptoms revealed no significant association with subsequent conversion (HR range 1.05–1.12, P range 0.09–0.38), including when analysing data for the no-drug condition alone (HR range 1.03–1.07, P range 0.30–0.51).

The capacity of LSI scores to predict subsequent conversion to schizophrenia-spectrum disorder during the no-drug condition was considered. Optimal classification accuracy was obtained using a cutoff of 4 or above for the maximum LSI score observed at the onset of and during no-drug periods to predict subsequent conversion. Overall classification accuracy was high (Fig. 1; Fisher’s exact test, P = 0.0001; positive predictive value 0.80, negative predictive value 0.94).

DISCUSSION

Elevated LSI scores signalled subsequent increased risk of schizophrenia-spectrum disorders when participants were not receiving olanzapine. In this condition, each unit increase in LSI score predicted an amplification of conversion risk of 78%. In contrast, concurrent composite symptoms measures did not signal subsequent risk of conversion when examined using the same analysis. These data suggest that elevated LSI scores during the prodrome signalled a covert conversion risk unexpressed by concurrent symptoms. Elevated LSI scores observed in this study might have been caused by excessive top-down processing of phonetic inputs, distorted perceptual processing or misinterpretation of percepts. Extracting spurious messages from meaningless input by patients at risk may extend beyond speech processing per se, as suggested by the Nobel prizewinner John Nash, whose schizophrenic illness emerged subsequent to his detecting ‘encrypted messages’ embedded in letter patterns appearing in the *New York Times*, which he attributed to space aliens or foreign governments (Nasar, 1998).

The significant interaction between condition and LSI scores reflected in the Cox regression analysis of conversion suggests that early administration of olanzapine reduced risk associated with elevated LSI scores.

The relatively small pool of prodromal patients reported here underscores the need for further studies of spurious message-like meaning induced by babble as a predictor of conversion to schizophrenia-spectrum disorders. Confirmation that LSI predicts risk of conversion – and that antipsychotic drugs reduce this risk – would be an important advance insofar as serial LSI assessments might then be used to identify the patients with prodromal symptoms most likely to benefit from preventive drug therapy.

REFERENCES


Correspondence

EDITED BY KIRIAKOS XENITIDIS and COLIN CAMPBELL

Contents ■ Psychopathy ■ Involuntary community treatment ■ Psychosocial interventions for self-harm ■ Psychiatric disorder and looked after status ■ Lithium for prevention of Alzheimer’s disease ■ Mortality and electroconvulsive therapy ■ Measuring stigma ■ Metabolic syndrome and intellectual disability

Psychopathy

Cooke et al (2007) claim that there is no compelling empirical evidence to support the conclusion that antisocial behaviour is a central feature of psychopathy. However, in the same issue of the *Journal of Personality Disorders* Cooke et al (2007) report a common genetic component to callous–unemotional traits and antisocial tendencies. Other studies cited by Viding et al report similar results. Moreover, Larsson et al (2007) reported that the same general four factors present in our four-factor model of psychopathy (Vitacco et al, 2003) all loaded onto a single genetic factor. Longitudinal research (not cited by Cooke et al) indicates that antisocial tendencies are significantly linked to the longitudinal stability of psychopathic traits (Frick et al, 2003). Cooke et al refer to the work of Cleckley (1988) to support their position, but in Cleckley’s accounts of psychopathy antisocial behaviours play an important role. As Patrick (2006: p. 608) noted, ‘There is no question that Cleckley considered persistent antisocial deviance to be characteristic of psychopaths. Without exception, all the individuals represented in his case histories engage in repeated violations of the law – including truancy, vandalism, theft, fraud, forgery, fire-setting, drunkenness and disorderly conduct, assault, reckless driving, drug offences, prostitution, and escape.’ As Blackburn (2007: p. 145) recently put it, ‘Contra Cooke, . . . antisocial behavior, conceived broadly, is a characteristic feature of psychopathy.’

In our paper based on a very large sample (Vitacco et al, 2005), we demonstrated the conceptual errors and flaws in modelling that went into the development of Cooke’s model and provided evidence for the four-factor model. Interestingly, Cooke et al did not cite this large study but rather chose to cite our small preliminary studies, although they are in line with our larger study. We do not view criminality as central to psychopathy. Indeed, the Psychopathy Checklist – Screening Version (PCL–SV) contains two items that refer to antisocial behaviour and that can be scored without evidence of criminality. The PCL–R and PCL–SV are virtually identical psychometrically, as noted previously by Cooke et al (1999).


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The article by Cooke et al (2007) contains a number of fundamental modelling errors. First, the authors continue to present an over-factored model (i.e. hierarchical three-factor model with testlets), which results in negative variances. This 13-item model actually contains 10 factors: 6 first-order factors/testlets, 3 second-order factors and 1 third-order factor (simply count the number of circles/factors in Fig. 1). Any model can achieve good fit when it is as complex as the data it attempts to summarise. We have shown that this testlet model results in untenable parameters in four separate studies (Neumann et al, 2006). One author of the Cooke et al paper has also suggested that the testlet model is over-factored (Skeem et al, 2003). Cooke does not acknowledge this problem of an over-factored model, even though it is evident in his published work (see Cooke & Michie, 2001, Figs 2 and 3, which contain zero variance terms that the EQS program sets to zero when estimating negative variances). Cooke et al (2007) mention that we have criticised their use of testlets but they do not dispute that it creates a misspecified model with untenable parameters. Our analysis of the testlet model is available upon request.

Cooke et al provided a polythetic correlation matrix, ostensibly to give investigators the opportunity to replicate their findings. However, as noted in the EQS program manual, robust procedures can only be conducted with the raw items. Thus, the results reported by Cooke et al appear to be transparent but in reality no one will be able to unambiguously verify their analyses. When we analyse their published correlation matrix using a non-robust procedure, very different findings result. Also, Cooke et al relied upon a maximum likelihood procedure for estimating model parameters, despite the fact that it is well known that this procedure underestimates model parameters and model fit when used with ordinal data (Everitt & Dunn, 2001) such as the items of the Psychopathy Checklist – Revised. There was no serious discussion on why robust maximum likelihood with polythetic correlations was employed, except that it is recommended in the manual for EQS version 6. None the less, the verisimilitude of this new approach is currently unknown. A program such as Mplus, which employs a robust weighted least-squares procedure for ordinal data is an accepted approach (Neumann et al, 2006). Cooke et al’s use of Mplus was limited. Our Mplus analyses of the UK data along with our previously
published findings can be found online (http://bja.rcpsych.org/cgi/eletters/190/49/s39).

Contrary to Cooke et al., the four-factor model clearly fits as well or better than a viable three-factor model. Moreover, our recent research indicates that the four first-order factors are explained by a cohesive superordinate factor (Neumann et al., 2006, 2007).


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Involuntary community treatment

Swanson et al (2000) reanalysed the results of the North Carolina trial (Swartz et al., 1999) and their findings are becoming increasingly influential in current debates about mental health legislation in the UK. Our recent systematic review (Churchill et al., 2007), which included these articles, demonstrated that there was no robust evidence to indicate that community treatment orders are associated with either significant benefit or harm. The secondary analyses performed by Swanson et al are, we believe, misleading for two reasons.

First, based on everyone in the trial the intention-to-treat (ITT) effect of randomisation to an involuntary out-patient commitment (OPC) was of a modest and non-significant reduction in violence (risk difference of 4.5%). This overall ITT effect of OPCs is a weighted average of the ITT effects in the two subgroups of participants defined by their post-randomisation management (those who received short-term OPCs and those who eventually received long-term OPCs). These two subgroups would exist in the control arm had they been placed on OPCs. Assuming that there was no benefit in those who received the short-term OPCs (i.e. risk difference 0), the results of Swanson et al suggest that the reduction in violence in those with long-term OPCs would be 12.4%. However, even if considered clinically significant, this finding would still not be statistically significant because the overall ITT effect was not significant (assuming a zero ITT effect in those receiving short-term OPCs implies that a test of the hypothesis concerning those receiving long-term OPCs is equivalent to the test for the overall ITT effect). The only way in which there could have been a beneficial effect in those receiving long-term OPCs is if the effects in those receiving short-term OPCs were actually detrimental (i.e. increased the rate of violence). It is improbable that they would be, and in policy terms it would be unacceptable to impose OPCs in the knowledge that they would cause harm to those in whom they are only applied for a short period.

Second, a post hoc comparison of the outcomes in groups defined by management decisions or patient behaviour following randomisation is potentially subject to selection effects (hidden confounding). That this is in fact the case is illustrated by the results of other subgroup analyses by the same research group (Swartz et al., 1999: Fig. 1). The group destined to be on long-term OPC have a better clinical outcome in the first 1–2 months. In other words there is evidence that the group destined to receive long-term OPCs have a favourable clinical profile before the OPC is renewed. We believe that it is likely that long-term OPCs will only be contemplated under certain circumstances, such as when the short-term OPC has apparently made a difference. Those who have intractable problems or in whom a short-term OPC has failed to make any change might not have their OPC renewed.

The investigators responsible for the North Carolina trial accomplished one of the most extraordinary trials ever performed and as such deserve enormous praise. However, the results described in these and similar secondary analyses are, we believe, flawed and misleading, and should not be taken as evidence for a beneficial effect of OPC. We made a similar point (Szmukler & Hotopf, 2001) following the publication of the original trial. The trial data are best interpreted using the main ITT analyses, which show no evidence of benefit or harm.


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Authors’ reply: Hotopf et al make essentially the same point that we stated in the article ‘. . . the study found no significant difference in the prospective rate of violence between the two randomly assigned groups: 32.3% in the OPC group v. 36.8% in the control group (Fisher’s exact test, one-tailed: P=0.292; two-tailed: P=0.567’ (Swanson et al, 2000).

Critics of OPC policy might wish we had left it at that, but straightforward analysis of randomised controlled trials does not tell the whole story. In this case it excluded people with a documented history of serious violence (n=64), since the court did not permit us to randomise these to the control group. However, variability in the real-world application of OPC allowed us to examine whether longer periods of court-ordered treatment were associated with lower rates of violence over the study year. They were.

Hotopf et al are rightly concerned about the possibility of favourable selection bias, but we think this is an unlikely explanation for our findings. Indeed, people with a history of treatment non-adherence were more than twice as likely to receive an extended period of OPC (40.0 v. 18.75%). If anything, this should have stacked the deck against finding an effect for long-term OPC.
Hotopf et al recalculated the post-randomisation effect for longer-term OPC in what they refer to as our ITT sample, rather than the sample we actually used. They say the effect is not significant but their calculation excludes the historically violent sub-group.

For hospital outcomes, unlike violence, we obtained follow-up information on the entire ITT sample through admission records. Here we found a statistically significant experimental result. For any month during the study year, the randomly assigned OPC group had a lower risk of readmission than the control group (OR=0.64, P<0.01). Hotopf et al do not mention this finding.

About one-third of the OPC group had their court orders expire very early in the study – during the first or second month – and more of these individuals were rehospitalised than those remaining on OPC, which explains the early separation of the lines in the figures from Swartz et al (1999).


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**Psychosocial interventions for self-harm**

Crawford et al (2007) conclude that the results of their meta-analysis ‘do not provide evidence that additional psychosocial interventions following self-harm have a marked effect on the likelihood of subsequent suicide’. This conclusion is far too bold considering the weaknesses inherent in the analytical approach employed. In my opinion Crawford et al have not allowed adequate weight for several methodological problems, the most prominent being the rationale for including studies in the analysis.

They acknowledge the ‘lack of statistical power’ in the meta-analysis but offer a definitive and sweeping conclusion.

The lack of statistical power is only one reason not to conduct the meta-analysis. The central rationale for clustering the included studies is seriously flawed. Not only have they mixed simple interventions and treatments, the target populations range from latency-age children (some as young as 12 years) to older adults (>50 years), intervention methods and theoretical orientations vary considerably (employing individual, group, case-management and home-based care), samples include those making suicide attempts as well as those engaging in self-harm (non-suicidal) behaviour, and they have also included studies that employed questionable intervention or treatment protocols for suicidality. A review of the intervention and treatment protocols of the studies included reveals wide variability in the nature, oversight and fidelity of the services being offered. I have serious concerns about at least 8 of the 19 study protocols. Some of the interventions cannot realistically be described as appropriate for suicidality, at least from the perspective that they have a serious chance of reducing subsequent pathology of suicide attempts, much less actual deaths. For example, Harrington et al (1998) employed four home visits by a social worker. Similarly, Guthrie et al (2001) included four sessions delivered in the patient’s home. Cedereke et al (2002) explored the utility of random telephone interventions and Clarke et al (2002) included ‘management enhanced by nurse-led case management’. As these examples illustrate, not all psychosocial interventions are the same, something Crawford et al (2007) failed to clarify in their article.

Why would we expect that a meta-analysis of randomised trials of interventions or treatments that are this broadly disparate (with samples equally disparate) would actually provide evidence of effective reduction of subsequent suicides?

Meta-analyses have become increasingly popular and increasingly misleading in their findings. Prior to inclusion in a meta-analysis of intervention or treatment outcome, I would suggest a thorough review of the intervention/treatment approach and related fidelity. Only those studies meeting strict and predefined criteria should be included. When considering strategies for including and clustering treatment studies for meta-analysis, it is particularly important to consider the targeted problem or disorder. Many, if not most problems targeted by psychosocial interventions and treatments are recurrent, persistent and potentially chronic in nature. Hence, the need for careful scrutiny of studies included.

Compounding the problems noted above, the follow-up periods for all of the studies included by Crawford et al ranged from 6 to 12 months. The efficacy of treatment or interventions for suicide will only be known after 5, 10 or 20 years. In shorter-term studies even if the results did show a reduction in subsequent suicides, we would not know whether the interventions or treatments were ‘delaying’ suicide or actually preventing it without longitudinal data.

There are many other factors that need to be scrutinised prior to inclusion of studies in a meta-analysis (e.g. sample size, categorisation of attempt status and suicide intent, fidelity/oversight of intervention or treatment) but space does not allow a full discussion. The point is that identifying appropriate inclusion criteria for such a study is a complex process which is far more complicated than simply taking all randomised controlled trials.

The definitive nature of the conclusion offered by Crawford et al belies the current state of the science in this area. In an age when legislators and funding agencies rely on science for direction, studies like this one generate ill-informed conclusions on what interventions, treatments and approaches to suicide prevention offer the most promise. Many readers will sadly and mistakenly carry away the message that psychosocial interventions offer no promise to reduce suicide rates.


Author’s reply: Professor Rudd raises important questions about whether it was appropriate to undertake this meta-analysis given the nature of interventions studied and the length of follow-up periods used. We believe it can be appropriate to synthesize data from randomized trials to examine clinically important rare outcomes that individual studies are unlikely to be able to detect. For instance, psychosocial interventions for alcohol misuse are effective in reducing alcohol consumption but a range of factors, including clinical inertia, mean that they are not widely delivered. By synthesizing data from trials conducted in a range of different settings, Cuijpers et al (2004) demonstrated that they are associated with a 30% reduction in subsequent mortality, a finding which may help to overcome some of the barriers to their delivery.

Although none of the studies we examined set out specifically to try to reduce suicide, it seems logical that interventions that are designed to reduce the incidence of suicidal behaviour should have an impact on the likelihood of fatal as well as non-fatal self-harm. Although several studies we included involved only brief interventions, such interventions have been shown to reduce the rate of suicide in other contexts, for instance in the period following discharge from in-patient psychiatric care (Motto & Bostrom, 2001).

Most of the studies we included followed people for between 6 and 12 months after the initial episode of self-harm. Although this is a relatively short period it is also the period during which suicide is most likely to occur (Owens et al., 2002). By focusing on the period immediately following an episode of self-harm we maximised the likelihood of being able to demonstrate an impact on the rate of suicide.

However, we fully endorse Professor Rudd’s comment that the results of our meta-analysis need to be interpreted with caution. Lack of data on suicide deaths in several of the trials that we identified meant that study power was limited. This resulted in wide confidence intervals around the pooled difference in suicide rates and it is therefore possible that additional psychosocial interventions do lead to reductions in subsequent suicide.


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Psychiatric disorder and looked after status
Ford et al (2007) investigated the possible explanations for the increased prevalence of psychiatric disorder in children looked after by local authorities and linked looked after status with higher levels of psychopathology, educational difficulties and neurodevelopmental disorders. They suggested that services should bear in mind that a change of environment might be appropriate in providing help, at least in some cases.

After carefully reading the article, I think that Ford et al have missed an important aetiological factor: the influence of genetics. Studies (e.g. Howard et al., 2001) have shown that children of parents with mental disorder are likely to be looked after by another person or organisation. Biological factors which caused mental illness in the parents of children currently looked after by services might operate to cause the increased prevalence of psychiatric disorder in these children. Hence by neglecting the biological component of the bio-psychosocial model of mental illnesses, Ford et al have failed to provide a comprehensive assessment of causative factors in these children.

The authors could have included psychiatric disorder in the parents as a variable and divided the looked after group into children of parents with or without mental disorder. Ford et al have identified that neurodevelopmental disorders and learning difficulties are associated with increased prevalence of psychiatric disorder. Both are also associated with the future development of mental illnesses such as schizophrenia (Done et al., 1994; Lawrie et al., 2001) in which genetic factors play an important aetiological role (Cardno et al., 1999).


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Authors’ reply We totally agree with Dr Sekar’s point that biological factors make an important aetiological contribution to the development of psychiatric disorder in children. We certainly did not intend to suggest that biological factors are any less important than psychological or social factors. Many childhood disorders are known to have a high level of heritability (Rutter et al., 2006). However, we should not forget that both our and previous studies suggest that similar risk factors operate in looked after children as in children living in private households, but that looked after children tend to have been exposed to more of them, sometimes at greater intensity (Stein et al., 1996; Ford et al., 2007). In our opinion, this includes biological as well as psychological and social factors.

Many studies have shown that parental psychiatric disorder is correlated with childhood psychiatric disorder (Rutter,
Although parental psychiatric disorder might increase the chance that children become looked after, this is not inevitable and there are many other reasons why children may enter the care system. In fact, only 6% of the children participating in the survey on which our analysis was based were accommodated primarily as a result of any type of parental illness.

As the survey involved no contact with the biological parents of participants and historical information about children who are looked after is notoriously scarce, we had no way of accurately assessing the mental health of the biological parents. Our paper refers to our frustration at the extremely limited amount of information available to the survey and in clinical practice, and we explicitly state that our analysis cannot be seen as covering all potential risk and resilience factors.

Even if we had access to data on the mental health of the biological parents, an excess of children with psychiatric disorder among parents with psychiatric disorder would not necessarily indicate a biological or genetic basis for this finding. The mean age that children participating in this survey entered the care system was between 7 and 8 years, and we know that mental illness can have an impact on parenting practices. Do the children of parents with mental illness have raised rates of psychiatric difficulties as a result of genetic vulnerability and/or exposure to maladaptive parenting, or perhaps both processes occur at the same time and/or moderate each other? The literature suggests that parenting is an important mediating variable, although other genetic and environmental factors also play a part in the familial aggregation of psychopathology (Ramachandani & Stein, 2003). Cross-sectional surveys are not able to disentangle such complex questions, as data about exposures and outcomes are gathered at the same time. Longitudinal designs would be needed to explore Dr Sekar’s theory.

### Lithium for prevention of Alzheimer’s disease

Nunes et al (2007) reported that the prevalence of Alzheimer’s disease in a group of elderly patients with bipolar disorder who were on continuous lithium treatment was significantly less than in a similar group without recent lithium therapy. After controlling for age, lithium use remained associated with a smaller risk of Alzheimer’s disease (age-adjusted OR=0.079, 95% CI 0.020–0.321). Conversely, Dunn et al (2005) showed that patients who received lithium had a significantly higher risk of dementia than those who did not (age-adjusted OR=1.8, 95% CI 1.1–2.8).

Nunes et al (2007) found no differences between the lithium and the comparison group in neuropsychological performance after excluding patients with Alzheimer’s disease. This is in accordance with our study using Mini-Mental State Examination (MMSE) scores (Terao et al, 2006). Our study, however, showed that patients with present and/or past history of lithium treatment had significantly better MMSE scores than patients without any history of lithium treatment (Terao et al, 2006). It is important to further investigate lithium in the prevention of Alzheimer’s disease with a large number of patients in prospective studies.

If lithium has a preventive effect for Alzheimer’s disease, there may be two possible mechanisms. First, it might indirectly prevent dementia via its prophylactic effects on mood disorders, because the rate of dementia increased 13% with every episode leading to admission for patients with depressive disorder and 6% for patients with bipolar disorder, when adjusted for differences in age and gender (Kessing & Andersen, 2004). Second, lithium might directly prevent dementia via its inhibition of glycogen synthase kinase 3 (GSK-3) alpha (Phiel et al, 2003) and GSK-3 beta (Phiel & Klein, 2001). Although Nunes et al (2007) found no significant differences in the number of previous depressive and manic episodes between the lithium and comparison groups, at present both possibilities should be borne in mind.
unipolar disorder developed dementia (MMSE < 24) compared with 3.4% of age-matched controls (Kessing, 1998; Kessing et al, 1999). Even within a younger sample of psychiatric patients (approximate mean age 50 years), Kessing et al (1999) reported that people with bipolar disorder had the highest risk of receiving a diagnosis of dementia, followed by those with unipolar affective disorder, schizophrenia and neuroses. Thus, if affective disorders do increase both the risk of dementia and the likelihood of receiving lithium treatment, then ongoing to the sampling method used by Dunn et al one could expect to find more lithium treatment among elderly people with dementia. Dunn et al discussed this alternative explanation of their findings as a ‘reverse causation’ possibility.

Dr Terao mentions the possible effects of lithium on GSK-3 beta. We recently investigated the effects of lithium on the transcriptional regulation of GSK-3 beta and found a significant reduction of its expression in primary cultures of rat hippocampal neurons as well as a reduction in regional intracerebral expression in lithium-treated adult rats and in leukocytes of elderly patients undergoing chronic lithium therapy for bipolar disorder (details available from the authors). These observations suggest a mechanism for GSK-3 beta inhibition by lithium, which may influence the formation of both amyloid plaques and neurofibrillary tangles, the two neuropathological hallmarks of Alzheimer’s disease.

We think that it is important to investigate further the potential protective effects of lithium in Alzheimer’s disease, as this could represent a low-cost universally available strategy to reduce the prevalence.

Mortality and electroconvulsive therapy

Munk-Olsen et al (2007) reported that the mortality rate from natural causes was lower for patients undergoing electroconvulsive therapy (ECT) than for other psychiatric in-patients. The lower relative risk was particularly significant for mortality linked to respiratory disease (RR = 0.67, 95% CI 0.55–0.95) and a trend was founded for cardiovascular disease (RR = 0.85, 95% CI 0.70–1.03). The authors concluded that this decreased risk of mortality from natural causes is unlikely to be the result of a selection bias. They based this statement on: (a) the absence of absolute contraindications to ECT in the international guidelines; and (b) the concordant findings of previous studies.

At variance with this statement, clinical practice suggests that psychiatrists are generally reluctant to consider ECT in patients with medical illness, and are more likely to ask for the opinion of a colleague in such a case (e.g. anaesthetist, cardiologist) (Benbow & Shah, 2002). Thus, patients with severe medical illness could be less likely to be treated by ECT. Furthermore, identification of cardiovascular diseases or pulmonary disorders, as well as physical examination and standard laboratory tests are part of a systematic screening procedure before ECT. This practice improves the diagnosis and the treatment of medical comorbidities. Indeed, the absence of such preliminary medical examination led to a high level of cardiac complications after ECT in the past (Gerring & Shields, 1982).

Accordingly current guidelines emphasise the importance of identifying and carefully managing patients with risk factors before, during and after ECT, as well as assessing the risks associated with anaesthesia (National Institute for Clinical Excellence, 2003). Patients receiving ECT are therefore not representative of all psychiatric in-patients. The careful assessment and treatment of their physical comorbidities contrasts with the increased rate of untreated physical illness in psychiatric patients, mostly because of inadequate somatic care in psychiatric units (Rasanen et al, 2006). Therefore, the observed diminution of mortality from natural causes in patients with ECT is more likely to be related to appropriate medical assessment and treatment than to a direct effect of ECT on physical health.

In an era that has seen ECT being opposed for political not clinical reasons, it was heartening to see an article on ECT addressing the very important issue of mortality. The study of Munk-Olsen et al (2007) is based on the Danish registry system which is acclaimed for its reliability, but certain issues need further clarification. It would have been relevant to know the total number of patients who received ECT and the total number of ECT treatments received by patients over the study period. Furthermore, the results could be better understood if information regarding physical comorbidity and the age of patients at the time of ECT had been provided. These variables can have a strong influence on mortality rates. In addition, as the study included only in-patients it is likely that the sample included patients who were severely ill. Also, the results show that inclusion of ‘days since last ECT treatment’ in the analysis causes the relative risk of mortality from natural causes of patients ‘discharged within the past 8–30 days’ to rise.

The relative risk of mortality from natural causes is also highest within 7 days of last ECT (RR = 2.11), which is similar to the trend seen in deaths due to unnatural causes, especially suicide. Both these figures go against the conclusion of the authors that the mortality from natural causes is lower with ECT. It must also be noted that the relative risk of dying by suicide after

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ECT is 1.20, which is not significant but which the authors refer to as 'a marginally significant trend', and 'significantly increased suicide rate'. The finding that the risk from suicide is highest in the first 7 days after discharge and ECT is based on a small sample (n=6). Although the authors concede that admission status and time since discharge are important confounders in the analysis of suicide in patients with affective disorders, the statistical analysis does not consider these factors when calculating the relative risk of suicide after ECT. The authors discuss in some length the lack of a selection bias of patients with poor physical health. However, it is likely that patients with very poor physical health are not given ECT and this introduces a selection bias. Also, given the bias that occurs as patients at high risk for suicide are given ECT preferentially, this calls into question the validity of the conclusions. Further, it would have been very useful if the authors could have compared the death rates with those in the general population. This study provides several good research questions which need to be pursued further.


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Authors’ reply: Both Le Strat & Gorwood and Bharadwaj & Grover comment on the finding of a decrease in mortality in ECT-treated patients. In Denmark, all psychiatric patients are given a thorough medical assessment prior to any somatic treatment. This is partly because of the well-known cardiac contraindications for the use of tricyclic antidepressants which were widely used during the study period from 1976 to 2000, as the selective serotonin reuptake inhibitors (SSRIs) were only available in the latter part of the period described. Furthermore, SSRIs were generally considered less effective than tricyclic antidepressants or ECT in patients with severe depression. Accordingly, ECT was often used in patients with contraindications for tricyclic antidepressants. We are aware that this notion is at variance with several British guidelines (e.g. National Institute for Clinical Excellence, 2003) but it is in accordance with Danish and American Psychiatric Association guidelines, which state that the only contraindications to ECT are cerebral and other aneurysms. In Denmark, a preponderance of patients with medical illness is thus found among ECT-treated patients compared with those treated with tricyclic antidepressants and we therefore maintain our conclusion.

Dr R Bharadwaj and Grover point out that admission status and time since discharge are important confounders. We fully agree and have hence adjusted for these variables in the analysis. The variables in Table 3 on risk of suicide in ECT recipients were mutually adjusted but this was not mentioned specifically in the footnote.

The number of patients dying by suicide in the first week after ECT discontinuation was small, and therefore our results should be interpreted with caution, as we mention in the discussion. Electroconvulsive therapy is often administered to patients who are assessed to be suicidal and we acknowledge that this could introduce selection bias (confounding by indication), which we also mention in our paper. These are the reasons why we concluded that: ‘the increased suicide rate among ECT patients shortly after treatment is probably a result of bias’ and we therefore disagree that the validity of the study is questionable regarding suicide rates after ECT.

A more in-depth description of the ECT patients can be found in a paper based on the same data (Munk-Olsen et al, 2006).

King et al (2007) frequently state that their stigma scale is measuring ‘the stigma of mental illness’ but, when closely scrutinised, it measures nothing other than stigmatisation perceived by users in outpatient, in-patient and crisis settings. There is no evidence that this is an objective assessment of stigmatisation. Users’ perception of stigma is affected by their mental state, depression, persecutory delusions or hallucinations. These symptoms can help to exaggerate the estimate of social stigmatisation (including rejection and discrimination) and hence the assessment is by no means an accurate measure. Measurements of more objective perceptions of stigmatisation can only be obtained from users in remission.

The reported negative correlation between self-esteem and perceived stigma can be confounded by high rates of both low self-esteem (e.g. Axford & Jerrom, 1986; Barrowclough et al, 2003; Blairy et al, 2004) and persecutory ideation and depressive cognition, including ‘self-stigmatisation’ in people with mental illness. Indeed, low self-esteem is a common symptom in psychiatric conditions such as depressive disorders, in which people can perceive more rejection and discrimination than warranted. Overemphasis on this correlation can divert attention from the fact that the correlation has to do more with people’s mental state than objective level of social stigmatisation.

An instrument can only be called ‘standardised’ if it is shown to be both reliable and valid. This instrument is not validated and so cannot be called standardised, on the basis of mere test–retest reliability. The correlation between the stigma scale and self-esteem scale is not an indication of validity of the instrument and although King et al admit this, they end up referring to their instrument as ‘standardised’ and to the correlation as ‘concurrent validity’.

A wide range of people with diverging diagnoses and mental states were recruited by King et al but there was no randomisation and no exclusion criteria. Even the ‘perceived stigmatisation’ cannot be attributed to a particular category of patients with a given diagnosis, or at least to psychiatric users in general, owing to lack of randomisation and inclusion of arbitrary proportions of participants with different diagnoses. This is likely to cause problems
in comparative studies. Also, stigma by definition excludes ‘positive aspects of mental illness’. This is why the authors decided to reverse the scores of the ‘positive aspects of mental illness’ factor. For this reason, they should have also called the factor ‘negative aspects of mental illness’, as a high score on this new factor then represents stigmatisation and its negative influence on the person.

In brief, a scale which partly measures people’s mental state and partly objective social reality is neither valid nor standardisable because it cannot measure what it is supposed to measure (i.e. it cannot satisfy the fundamental condition of validity).


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Authors’ reply We were puzzled by Dr Haghighat’s criticism of our development of a stigma scale and would like to respond to his points. First, ours is a self-report measure of perceived stigma and we do not claim otherwise. Perceived stigma is a valuable construct that may have a greater impact on mental and social well-being (including relationships and occupation) than so-called objective acts of discrimination. This is also true of social support. Second, we agree that the relationship between perceived stigma and low self-esteem is potentially confounded by low mood. However, our sample contained a heterogeneous group of participants from a range of settings and thus it is unlikely that a sizeable proportion were depressed at the time of the study. In addition, Dr Haghighat overlooks the complexity of any putative association between stigma and depressive symptoms. Perceived stigma may cause or maintain depressive episodes.

Third, it is important to avoid invalidating reports of perceived stigma by dismissing them as depressive or paranoid epiphenomena. Fourth, Dr Haghighat claims that our instrument has no validity. In fact, as we made clear in our paper, it is based firmly on the views and experiences of people with mental illness who were interviewed in depth in a previous study (Dinos, et al, 2004), and thus it has greater validity than many scales used in the field of mental health. Fifth, we do not understand Dr Haghighat’s reference to randomisation, which has no role here.

However, the document is a little unclear as to the exact number of participants and the specific nature of the potential relationship identified. True positive relationships are not evidence of absence of risk, but rather evidence of protection. Finally, participants in our earlier qualitative study (Dinos et al, 2004) emphasised that positive outcomes may arise from experiencing mental illness and thus such items were included in our scale. We reversed their scores to indicate that stigma might be greater when such positive aspects were lacking. This is not the same thing as assuming mental illness has only negative aspects. In parallel fashion the opposite of risk is not protection, it is lack of risk.

Metabolic syndrome and intellectual disability

Mackin et al (2007) highlight the importance of screening and management of metabolic syndrome in patients with severe mental illness. This is particularly important in patients with intellectual disability as they have high rates of both physical and psychiatric comorbidities compared with the general population (Welsh Office, 1996). In addition, considerable evidence points to a disparity between the health of people with learning disability and the general population, and this was also highlighted in two Mencap reports (Mencap, 2004, 2007).

Suggested causes for this disparity include specific patterns of complex health needs associated with the aetiology of their intellectual disability, sensory and communication difficulties, reliance on carers to communicate their health needs, and barriers to healthcare accessibility due to poor professional knowledge and attitudes.

The Government White Paper Valuing People (Department of Health, 2001) acknowledges this disparity and identifies the improved healthcare of people with intellectual disability as a key outcome. However, the document is a little unclear on how these aims will be achieved.

As Mackin et al point out few studies specifically examine the impact of different models of care on physical well-being and comorbidities in people with severe mental illness, and this is also the case for people with intellectual disability. There is a pressing need for evidence-based integrated models of care for delivering high standards of care for this patient group.


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One hundred years ago

On the Etiology of Mongolian Idiocy [Mongolidiotiens Ætiology].
(Nyt Tidsskrift für Abnormvæsenet, 9 Hefte, 1906.)
Bodil Hjorth

Dr Bodil Hjorth, who is Assistant Physician to the Keller’s Institution in Copenhagen, found that out of 750 imbeciles 30 presented the characters of Mongolian idiocy. The proportion is the same in England and Sweden. In Germany, he tells us, it is from 1 to 2 per cent.

Mongolian idiocy is so marked and specific a form that one might expect it to have a determinate cause. The author has collected information about the parentage and birth of twenty-one Mongolian idiots, which he gives in a statistical table. The observed conditions assumed as possible causes are phthisis in the parents or grandparents, neuropathic heredity, and alcoholism. None of these occur so often as to show a preponderating influence. There is no record of syphilis in any of the cases. Twins, both presenting the specific characters, are noted, the father a day labourer, æt. 41, the mother æt 42. These children were the eighth and ninth of a family of ten. Out of 21 cases, 12 of these Mongolians were the last children in the family.

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REFERENCE

Journal of Mental Science, January 1907, 182.
Researched by Henry Rollin, Emeritus Consultant Psychiatrist, Horton Hospital, Epsom, Surrey
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Corrigendum

Ten books . . . Chosen by Michael King. BJP, 191, 268–270. The doi for this paper is 10.1192/bjp.bp.107.035832 (correct online and printed on p. 268); the doi printed on p. 270 was included in error.
Book reviews

EDITED BY SIDNEY CROWN, FEMI OYEBODE and ROSALIND RAMSAY

The Overlap of Affective and Schizophrenic Spectra

If this book is not of interest, the reader has no business being a psychiatrist.

The official classifications, ICD–10 and DSM–IV, that psychiatrists are currently required to use are sets of descriptive categories that were designed to provide clinicians and researchers with a reasonably reliable language to aid communication and decision-making. Developed from the opinions of committees of experts rather than on the basis of useful data regarding aetiology and pathogenesis, the categories are essentially a modified version of the basic dichotomous scheme proposed by Kraepelin at the end of the 19th century. As has been argued in editorials within this journal, there is an ever-increasing and progressively more robust body of data that demonstrates the need for modern psychiatry to free itself from a historically based dichotomous classification and move towards approaches that recognise alternative diagnostic entities that more closely reflect the illnesses of our patients (Cradock & Owen, 2005; Marneros, 2006; Angst, 2007).

This book approaches mood and psychotic disorders from such an alternative perspective, namely considering clinical spectra of affective and schizophrenic symptomatology that may overlap within the same individuals either at the same or at different times during life. The editors are well-known for their work in this area. There are 14 chapters that deal with a broad range of clinical, biological and psychological issues using a spectrum approach. The authors of these chapters include leaders in the field who have published important data and theoretical papers that examine the overlap in mood and psychotic symptomatology beyond the traditional schizophrenia/mood disorder categories. The book is well written and provides an excellent accessible overview of relevant research.

If psychiatry is to translate the opportunities offered by new research methodologies into benefits for patients, we must move to a classificatory approach that is worthy of the 21st century. This book provides a wealth of useful, clinically relevant information that will be of interest to any reader who accepts the importance of taking account of a patient’s illness beyond simple allocation to an operational diagnostic category. All psychiatrists involved in the management of individuals with mood and psychotic illnesses should read this book.


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Speed, Ecstasy and Ritalin: The Science of Amphetamines

The 2005/06 British Crime Survey estimated that ecstasy and amphetamines were the third and fourth (after cannabis and cocaine) most widely used illicit drugs among 16- to 59-year-olds (by 1.6% and 1.3% respectively) in England and Wales. More worryingly, among 16- to 24-year-olds the corresponding figures increased to 4.3% and 3.3%. There are also fears of an emerging epidemic of illicit methamphetamine (crystal meth or ice) misuse in the UK, resulting in its recent reclassification from Class B to Class A under the Misuse of Drugs Act 2005. So, too, methylphenidate and dexamphetamine were recognised by the National Institute for Health and Clinical Excellence (2006) as appropriate treatment options for attention-deficit hyperactivity disorder (ADHD) in children and adolescents. Amphetamine dependence, as part of polysubstance dependence, its many psychiatric complications (depression, anxiety, psychosis, etc.) and dual diagnosis are not uncommon presentations in psychiatric practice. It is in view of all of the above that this book is timely and relevant to clinicians, addiction scientists, drug policy makers and the public.

Leslie Iversen (a distinguished pharmacologist) presents an overview of the ‘positive and negative aspects of amphetamines...’
The Psychiatric Interview in Clinical Practice (2nd edn)


Interviewing and communication skills are rightly assuming a prominent position in medical education. UK postgraduate trainers will soon be responsible for assessing trainees’ communication skills, even though they may have had little or no training themselves. Therefore, books such as this appear timely and welcome, although it is unusual for the second edition of a book to be published 35 years after the first. For a book about communicating, however, the title is somewhat misleading. It appears to have been written primarily for clinicians assessing patients with a view to offering psychodynamic psychotherapy.

The book is divided into four main parts which cover general principles, major clinical syndromes, special clinical situations and technical factors affecting the interview. Most of the book focuses on clinical syndromes, with chapters on, for example, the narcissistic patient and the psychotic patient. Each chapter has a similar structure of characteristic clinical features, differential diagnosis, defence mechanisms and developmental psychodynamics, followed by ‘the management of the interview’.

This is a large book, written by three wise men with a wealth of clinical experience. It is filled with helpful nuggets of advice. For example, the chapter on the obsessive–compulsive patient beautifully describes the diverting tactics patients use to avoid directly answering questions, with useful suggestions on how to counter them.

The parts on the management of the interview are the most rewarding to read, particularly the section on discussion of suicide with patients with depression. Given the title, I expected more emphasis on basic communication skills, such as question style and responding to cues. There was discussion of listening and facilitation, but in the main the focus was more on psychoanalytic understanding. The occasional excerpts of dialogue were excellent, but it would have benefited greatly from many more of these valuable illustrations.

The book is written in a flowing style with long paragraphs taking up a whole page. Nowadays, however, with short attention spans and many books having attractively laid-out chapters filled with bullet points and coloured boxes, I wonder how many trainees will actually read a book like this.

For clinicians negotiating the early stages of assessment and engagement in psychodynamic psychotherapy, it is no doubt an extremely useful book, but probably not the first choice for those wishing to purchase a more comprehensive book on general psychiatric interviewing. Libraries should definitely have a copy for people to dip into for helpful tips on specific clinical presentations.

Finally, there was a long wait for this second edition and I wonder whether we will still be undertaking standard psychiatric assessments 35 years from now.

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Evolving Psychosis: Different Stages, Different Treatments


What we have here, on the whole, is a series of essays and monologues which invite the reader to focus on the success and importance of psychosocial treatments. There are individual chapters on phase-specific treatment, which go some way to addressing whether early needs-adapted treatment can prevent the long-term effects of psychosis. But what is also contained in this interesting and challenging book broadens its scope considerably.

We learn, for example, about the post-Lancanavian view, ideas rarely taught in
BOOK REVIEWS

Critical Voices in Child and Adolescent Mental Health
By Sami Timimi & Begum Maitra.

Child psychiatry should be challenged and this worthwhile, though occasionally uneven, book edited by Sami Timimi and Begum Maitra aims to start a critical debate. In medicine we are too often taught that there is only one right answer, but in psychiatry looking at the development of the formal classification systems should at least cause some doubt.

The authors criticise the increasing dominance in child psychiatry of a biomedical model which implies linear causation of ‘disorder’ on an individual basis and ignores the historical and cultural context. They are especially well able to take a sideways glance at this phenomenon because of non-European backgrounds and, therefore, observe that although immaturity is a necessary stage, its construction in terms of childhood is culturally determined.

The 19th century was the great age of institutions in Britain. Children were no longer allowed to work and then were required to attend school, thus becoming available for observation, measurement and classification. Many were removed from home and placed in residential schools and children’s homes, a practice which continued until the 1980s. As with adult psychiatry, deinstitutionalisation occurred for a variety of reasons, some well-intended,
and two give a brief background about the disorder and introduce the concepts and methodology of psychoeducation. Part three gives details of the Barcelona Psychoeducation Program, which is one of the few evidence-based psychological treatment models for bipolar disorders.

This is mainly a ‘how to’ book giving clear, practical guidance about when to introduce psychoeducation. The Barcelona Program consists of 21 sessions each lasting one and a half hours. The sessions are clearly described with goals, procedures, useful tips and patient material. Francesc’s personal commitment to the treatment of patients with bipolar illness also comes through. They are given explicit encouragement and permission to ring if they are worried about possible relapses and provided with information about how and when to contact him. Such patients are not easy to treat. Therapists need to be committed clinicians who are familiar with the disorder. It is made clear in the book that this is an intensive and complex psychoeducation programme. Furthermore, the authors advise that 8 patients will be the optimal number for the group, but that it is sensible to start with 12 to 14, allowing for drop-outs. Moreover, patients have to be stable for 6 months with a Young Mania Rating Scale score < 6 (Hamilton Depression Rating Scale score < 8).

The authors are also appropriately realistic about the objectives of working with individuals with bipolar disorder. Some goals such as awareness of disorder, early detection of warning symptoms and adherence to treatment are aimed at every patient in the group. Others such as controlling stress, avoiding substance use and misuse, and achieving regularity in lifestyle are described as ‘desirable and not exclusively the responsibility of the psychoeducation program’ whereas improving social and interpersonal activity between episodes and confronting residual sub-syndromic symptoms and impairment are described as part of an ‘excellent scenario’ of treatment outcome.

To sum up, the authors have done a brilliant job in developing such a thorough psychoeducation programme. I would recommend anyone interested in working with patients with bipolar illness to buy this book.

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**The Science of Orgasm**


Sex fascinates us all and now it seems that everyone has a view. The media abounds with advice about sex from doctors, psychologists and therapists who jostle for recognition. But despite the surfeit of advice there is little science. The problems of taboo and censorship have been replaced by one of validity. This book provides information from the best available evidence. Talk of sex being as strenuous as walking up stairs or walking a mile does not pack the same punch as how many patients have a heart attack ‘in the saddle’. Even in the priapic, post-Viagra age the figure seems low: 1.5% of 1700 cited in the chapter titled ‘are orgasms good for your health’.

The authors are a professor of psychology, of nursing, and the head of a laboratory. They have proceeded from definition to physiology and pathophysiology, and the effect of prescribed and elicit drugs. They review the research into the endocrinology and the neurology of sex in both the intact and damaged brain. The information from imaging is assessed. All the while the authors have not strayed beyond what is in the literature.

The instruction does not crowd out the entertainment. They have an eye for the intimate when a researcher’s erection, induced by a self-administered alpha blockade, ‘is entirely undiminshed by concentration on exacting intellectual tasks . . . I took an urgent and worrying telephone call without losing the erection’. One presumes the caller was unaware.

The authors should be congratulated on taking the trouble to produce a readable comprehensive account of the literature on orgasm. All psychosexual clinics will need to have a copy as well as anyone who advises others about psychosexual problems.

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From the Editor’s desk

PETER TYRER

AN INDEPENDENT JOURNAL

In the spirit of openness permeating learned journals we now have to declare all relevant interests so that the reader is aware of potential bias. The British Journal of Psychiatry is published by the Royal College of Psychiatrists but we seldom spell out its exact relationship. My awareness of this crystallised years ago when submitting my first original paper. I sought the advice of my consultant, the late Professor Michael Shepherd. I sent him my draft paper and arranged a meeting. ‘Which journal were you thinking of sending this article to?’, he enquired silkily, interlacing his fingers repeatedly as though engaged in complex invisible knitting. ‘The British Journal of Psychiatry’, I blurted nervously. ‘The British Journal of Psychiatry’, he observed in horror, ‘that is not an independent journal; it is an organ of the Royal College of Psychiatrists’, pronouncing the word ‘organ’ in a way that made it sound simultaneously reprehensible, ridiculous and obscene. ‘What you should do is to send it to Psychological Medicine.’

Since being editor of the British Journal of Psychiatry I am convinced this allegation of subservience is quite unfounded. The Journal is independent, no pressure is put on the Editor to follow any official line or doctrine, and there is no bar to the publication of a good paper irrespective of any stance taken by the College. This is illustrated well in the current issue, in which we stir the pot of controversy more than the consensual Royal College ever can, or ever should, for an organisation that represents such a broad church. So David Kingdon (pp. 285–290) takes up the cudgels first wielded by Pinel in arguing for research linked to the breadth and value of human experience in attacking the new kid shining on the block, biological psychiatry, defended with reductionist precision by Allan Young. Please follow the thrust and counter-thrust of their arguments carefully, and you might conclude that Professor Young’s question ‘is this a form of occupational therapy for two academic psychiatrists with nothing better to do?’ can either be dismissed as rhetorical or promoting the understated academic discipline of occupational therapy, but certainly is not a waste of time.

Biological psychiatry demands reliable tests, and what could be better than chocolate (my sweet tooth is showing) as the diagnosing agent (Parker & Crawford, pp. 351–352). Certainly, the controversial diagnosis of ‘depression-associated chocolate craving’ (shortly to be abbreviated to DACC) would be a welcome addition to the less-than-appetising fare currently on display in DSM–IV. There is also going to be debate about the conclusions of Raleigh and her colleagues (pp. 304–312) that ‘factors associated with ethnicity, rather than ethnicity per se, are stronger determinants of patient experience’. So can the hundreds of Othello’s encountering the psychiatric services feel confident when they instruct, ‘speak of me as I am; nothing extenuate, nor set down aught in malice’, or are there subtle influences leading to possible bias not identifiable in a postal survey? Good reasons for coercive treatment are at the core of psychiatric practice but should we concentrate more on capacity, the ability of the individual to make autonomous decisions or on mental health, or on nature of illness and risk? Previous publications have suggested that our ability to assess capacity has been underestimated (Cairns et al, 2005a,b) and that perhaps this should be joined with mental legislation to avoid ‘unjustified legal discrimination against mentally disordered persons and apply consistent ethical principles’ (Dawson & Szmukler, 2006). The review by Okai et al (pp. 291–297) suggests clinicians could all make formal assessments of capacity with benefit. ‘Could’ may become ‘should’ in future – this is where the College would come in – but we at the Journal have to remain independent from these decisions and concentrate on being evidence suppliers, not product champions. In doing so we can add passionately to other debates, such as the long-standing one of the role of glutamine in schizophrenia (Théberge et al, pp. 325–334), alternatives to seclusion in psychiatry (Gaskin et al, pp. 298–303) and the influence of urban dwelling on the risk of schizophrenia (Allardyce et al, 2005; Weiser et al, pp. 320–324).

So, I hope I have convinced you that we are no more an organ of the Royal College of Psychiatrists than a drum beating to the tune of Symphony Pharmaceuticals. Our declaration of interest, slightly pompous but genuinely intended, is to select the best compositions to be played by the psychiatric orchestra, with only science as the conductor. Come to think of it, when reflecting on my earlier anxious encounter I think my mentor should also have declared his interest. He was telling me, in his very roundabout way, that he liked, perhaps tolerated rather than liked, my paper and wanted it in Psychological Medicine, a journal that I noted was edited by a certain Michael Shepherd.

CHANGES IN PSYCHIATRIC BULLETIN

After nine fruitful years, Tom Fahy is leaving the editorship of Psychiatric Bulletin this month and Patricia Casey has been selected to replace him. We wish Tom well and thank him for his careful stewardship of the journal over this long period. For many years Psychiatric Bulletin has been the ‘in-house’ journal of the College and has frequently, much to our chagrin, been more avidly read by some members than the British Journal of Psychiatry. We do not want to change its readability but have long been trying to improve its status in the international journal market. Could our readers and authors please note this – and keep an eye on its output and aspirations.


