It’s time to change the way we manage nursing home residents with diabetes

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Recent publications have contended that the management of diabetes in older persons, particularly institutionalized older persons, can be liberalized with less aggressive glycosylated hemoglobin (A1c) and blood glucose goals than in younger, healthier individuals.\textsuperscript{1-4} The American Diabetes Association (ADA) in cooperation with the European Association for the Study of Diabetes (EASD), published management guidelines advocating a patient-centered approach to care which takes into consideration the patient’s attitude and expected treatment efforts, risks potentially associated with hypoglycemia, disease duration, life expectancy, comorbidities, established vascular complications and available resources.\textsuperscript{1} Less stringent control is reasonable for patients with poor self-care capabilities, when the risk of hypoglycemia is high, in those with long-standing diabetes and short life expectancies, comorbidities, vascular complications and limited resources. Similarly, a consensus report by Kirkman et al, provides a framework for setting less stringent A1c and blood glucose goals as the complexities and number of underlying illness increase such that those with end-stage disease and limited life expectancy may be candidates for A1c, fasting blood glucose and blood pressure goals of \(<8.5\%\), 100–180 mg/dL and \(<150/90\), respectively.\textsuperscript{2} The 2013 ADA update in recommendations for the management of diabetes supports relaxing glycemic goals in some older adults with functional or cognitive impairments but cautions to avoid hyperglycemia that put older adults at risk of hyperglycemic complications.\textsuperscript{3}

Yay et al\textsuperscript{4} evaluated 367 nursing home eligible community-dwelling adults with diabetes to determine if A1c values predict functional decline and discovered that A1c values of 8.0–8.9% were associated with better functional outcomes at 2 years than those with A1c between 7.0 and 7.9%. These subjects, aged 80 ± 9 years, had significantly impaired activities of daily living (ADL), cognitive impairment and multiple comorbidities.

As a result of increasing support to liberalize A1c and blood glucose goals in older, institutionalized adults, re-examination of treatment expectations as well as treatment choices may be warranted. As is shown in Fig. 1, it is important to establish patient-specific goals to optimize quality of life while minimizing the risk of hypoglycemia. In those for whom life-style changes alone have not produced a patient-specific A1c goal, addition of metformin is the recommended initial drug therapy.\textsuperscript{1,3} While previously metformin was thought to be contraindicated in persons older than 80, those with heart failure, and those with creatinine clearance less than 60 mL/min, the National Institute for Health and Clinical Excellence (NICE) guidelines allow use of metformin down to a creatinine clearance of 30 mL/min with dosage reduction for creatinine clearance less than 45 mL/min.\textsuperscript{5} Unless ventricular dysfunction is severe or the patient’s cardiovascular status is unstable, use of metformin is no longer considered contraindicated.\textsuperscript{6} By lowering the range of creatinine clearance values acceptable for metformin treatment many more older persons can benefit from this highly evidence-based therapy.

Fig. 1 presents three options (i.e. basal insulin, dipeptyl peptidase (DPP-4) inhibitor, glucagon-like peptide (GLP-1) agonist) as second-choice drug therapy when metformin-alone has not achieved the desired A1c and blood glucose values. Because of the risk of hypoglycemia associated with sulfonylureas
and the risk of edema associated with thiazolidinediones (TZDs), these drug classes are not recommended in older persons. Sulfonylureas and rosiglitazone are included in Table 1, Medications of Particular Relevance in the Centers for Medicare & Medicaid guidance to surveyors of long term care facilities; glyburide and chlorpropamide are high risk medications. Neither DPP-4 inhibitors nor GLP-1 agonists are associated with causing weight gain or hypoglycemia and both are effective in lowering blood glucose and A1c. When one or more of the second-line options fail to achieve goal A1c and blood glucose parameters, basal insulin can be added. Subsequently, therapy can be intensified by adding four (4) units of rapid-acting insulin to the largest meal of the day and titrating to goal prandial blood glucose concentrations. Throughout titration and optimization of therapy patients should be monitored for response to therapy and potential adverse consequences which vary by pharmacologic class.

Initiation of appropriate therapy is important in undertreated nursing home residents with diabetes. Just as important is the need to reassess the ongoing need and appropriateness of medications.

With the goal of optimizing therapy to achieve a patient-specific goal A1c and blood glucose concentration without hypoglycemia, opportunities often exist to discontinue or replace medications that have associated adverse effects or are minimally effective. Use of sliding scale insulin has been discouraged, and is a target for quality improvement for several organizations and remains a focus for citation by surveyors in long term care facilities. Fig. 2 points out sliding scale insulin and several oral therapies recommended for re-evaluation and discontinuation. Glititides, rosiglitazone, α-glucosidase inhibitors, pramlintide, colesevelam and bromocriptine are only modestly effective in achieving A1c and blood glucose goals and carry the risk of adverse consequences that outweigh their potential benefit. When diabetic patients are admitted to long term care facilities clinicians have the opportunity to re-evaluate these therapies and discontinue them. Replacement with safer, more effective agents, such as DPP-4 inhibitors or GLP-1 agonists is recommended when additional glycemic control is needed.

Lastly, elimination of sliding scale insulin should be attempted in every facility. Residents admitted from an acute care setting may
benefit from short-term (i.e., a few days) of sliding scale insulin when undergoing a glucocorticoid taper or resolution of infection and during other times when significant changes in glycemic control are anticipated. However, beyond the first few days, nursing home residents benefit from proactive glycemic control strategies like younger, healthier patients and should not be relegated to reactive control with sliding scale insulin. Fig. 3 offers an algorithm for elimination of sliding scale insulin in residents of long term care facilities.

In summary, we suggest the following key strategies to improve the management of type 2 diabetes in nursing home residents:

- establish patient-specific A1c and blood glucose goals reasonable for the clinical circumstances that optimize the resident’s quality of life and minimize the risk of hypoglycemia;
- broaden the population of nursing home residents eligible for treatment with metformin based on revised guidance;
- consider abandonment of sulfonylureas, rosiglitazone, glitazones, α-glucosidase inhibitors, pramlintide, coleselvam and bromocriptine;
- consider preferred use of effective, safe therapy (i.e., DPP-4 inhibitors and GLP-1 agonists) that does not cause weight gain, hypoglycemia or troubling gastrointestinal side effects;
- focus on reduced use of sliding scale insulin beyond the first few days in the facility, depending on the individual situation and clinical circumstances;
- shift use of NPH insulin to basal insulin and short-acting insulin (i.e., human insulin) to rapid-acting insulin (insulin analogs) to produce more predictable, consistent glycemic control responsive to the circadian variability of blood glucose; and
- when intensification of therapy is needed, consider the addition of 4 units of rapid acting insulin to the largest meal of the day.

By employing the strategies outlined above and in the accompanying figures, nursing home residents with diabetes may enjoy a better quality of life, have fewer emergency department or hospital visits for management of hypoglycemia and experience less functional decline.
Sliding scale insulin is not appropriate in the management of DM beyond the first few days in the facility. Work to migrate residents off SSI within 15 days. Reduction of insulins should be a goal of therapy.

Fig. 3. Algorithm for discontinuing orders for sliding scale insulin. (This figure is copyrighted to Omnicare, Inc., and used by permission in this publication.)

References

9. State Operations Manual: Appendix PP. Guidance to Surveyors for Long Term Care Facilities, F329 Unnecessary Drugs, Table 1, rev 1-7-2011.