Soak and Smear

A Standard Technique Revisited

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Background: Atopic dermatitis, nummular eczema, chronic hand dermatitis, palmar plantar psoriasis, and xerotic eczema are common inflammatory skin conditions. They may be refractory to conventional topical and even systemic treatment. Little evidence is available that demonstrates the benefits of aggressive topical treatment of patients with these disorders.

Objective: To describe a simple, inexpensive, effective topical treatment with an accompanying patient educational sheet.

Design: A retrospective study of 28 patients referred to a tertiary care center for refractory chronic pruritic eruptions. Intervention with a plain water 20-minute soak followed by smearing of midstrength to high-strength corticosteroid ointment led to clearing or dramatic improvement.

Results: Objective and symptomatic improvement was obtained from aggressive topical treatment. It was well accepted in this group of referral patients.

Conclusions: Hydration for 20 minutes before bedtime followed by ointment application to wet skin and alteration of cleansing habits is an effective method for caring for several common skin conditions. Prospective studies are needed to further validate these findings.

Arch Dermatol. 2005;141:1556-1559

Some diseases are characterized by a compromised skin barrier and may be associated with pruritus, fissuring, or scaling. While general principles of moisturization and occlusive therapy are well appreciated, application of these concepts is messy and time consuming and requires extensive patient education for acceptance. We have developed a patient educational tool and a descriptive easily understood name, “soak and smear,” to treat patients experiencing various eczematous dermatoses.

Xerotic eczema commonly affects older individuals and can be a distressingly uncomfortable eruption. Symptoms include itching, a pinprick sensation, and, less commonly, formications. Atopic skin is predisposed to alterations in barrier function and increased sensitivity to irritants. In addition, patients with occupations or vocations that require repeated wetting and drying of the skin, such as with routine hand washing, may develop chronic eczema, painful fissures, and, at times, infection.

Clearly, many patients with the described conditions will benefit from aggressive topical therapy at a time of day suitable for soaking and greasy ointment application. Soaking and smearing involves soaking an affected body part or whole body bathing in plain water for 20 minutes to be followed immediately by smearing an ointment over the affected area, without drying the skin. The applied ointment is usually 0.1% triamcinolone acetonide ointment or a class 1 corticosteroid ointment for psoriatic hand involvement. Treatment includes a morning application with a cream of the same strength as the nighttime ointment.

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During this intensive therapy, a maintenance component is initiated. Educating the patient regarding the deleterious effects of repeated wetting and drying, especially when combined with the use of soap, is accomplished. Strategies to limit drying of the skin, such as limiting the use of soap to apocrine-containing sites and adding moisturizers after any washing, are instituted with the initial therapy. This component is continued during the maintenance phase of treatment.

In our experience, soaking and smearing is highly successful in treating patients referred to our clinics for refractory dermatoses. We performed a retrospec-
A prospective study of 28 such patients and present 1 illustrative case in detail.

An 84-year-old man was referred for treatment of severe pruritus primarily of his arms and legs of 5 years’ duration. He reported that the itching was so severe that it was interfering with his sleep. Unsuccessful treatments in the past included applications of petroleum jelly, aloë, various moisturizers, halobetasol propionate ointment, fluocinolone acetonide ointment, and betamethasone dipropionate augmented. A physical examination revealed dryness of the patient’s arms and legs, with excoriations present. He was diagnosed as having severe xerosis with pruritus and began to undergo the soak and smear regimen with 0.1% triamcinolone acetonide ointment applied to wet skin after a 20-minute plain water soak. The patient was educated regarding alteration of bathing habits and moisturizing after his daily showers. At follow-up 5 weeks later, the patient’s condition was clear. He reported relief of his symptoms beginning with the first night of treatment. After 2 weeks, he was simply smearing 0.1% triamcinolone acetonide ointment before bedtime. He was sleeping well, and his skin was well hydrated. During the follow-up visit, the patient was switched to the soak and smear therapy with only petroleum jelly, with the plan to eventually use moisturizer only after his showers and before bedtime as maintenance therapy.

**METHODS**

Patients were identified from a university-based referral practice focusing on difficult-to-treat and difficult-to-diagnose dermatologic diseases. Initial screening was done of medical records of patients who were diagnosed as having atopic dermatitis, xerosis, or chronic hand dermatitis, and who underwent treatment with the soak and smear protocol (n = 34). Patients were verbally educated regarding the treatment protocol and then given a written instruction sheet that summarized and reinforced the oral recommendations (Table). Exclusion criteria were then applied, which included the following: (1) no follow-up after the initial visit (n = 5), (2) medical record not available for review (n = 1), and (3) soak and smear treatment noncompliance (n = 0). As a result, the final study population included 28 patients ranging in age from 24 to 84 years. Outcome measures were determined by the state of disease at follow-up, which was recorded as either complete clearance, meaning no evidence of disease, or as a percentage of improvement, which was a combined global assessment of disease by the patient and treating physician.

**RESULTS**

Twenty-eight patients were included in the analysis (14 men and 14 women), ranging in age from 24 to 84 years. Their diagnoses were atopic dermatitis (n = 15), xerotic eczema (n = 5), psoriasis (n = 4), nummular eczema (n = 2), irritant dermatitis (n = 1), and undefined dermatitis (n = 1). All patients had long-lasting eczema and were referred to 1 of us (W.D.J.) after an average duration of active disease of 6.2 years (median, 3 years). Of the 28 patients, 8 had hand eczema, 4 had dermatitis limited to the extremities, and the remaining 16 had a generalized pat-

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<th>Table. Soak and Smear Patient Educational Instruction Sheet</th>
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<td>Eczema is a chronic condition of the skin that can cause itchiness and redness. Patients with eczema have sensitive skin, more sensitive than normal skin. Sensitive skin is more easily irritated (which causes the itchiness) by dryness and irritants in the environment (such as wool in clothing or chemicals in lotions). Eczema can be controlled with good skin care and environmental measures (avoiding things that irritate your skin).</td>
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<tr>
<td><strong>Soaking and Smearing</strong></td>
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<td>This is an aggressive treatment that is both messy (find an old pair of pajamas) and time intensive. This regimen may use a medication you have used before without success. But this medicine is being used in a different way as part of an intensive treatment regimen that must be followed exactly to work. This treatment can lead to marked improvement in even a couple of days. The number of nights of soaking and smearing depends on the severity of the disease and how long it takes to get under control. Usually patients do the soaking and smearing at night for 4 nights to 2 weeks. The soaking and smearing treatments are done at night because the ointment on your skin will get on your pajamas instead of your clothes (that you wear during the daytime) and the ointment will be on your skin for several hours while you sleep. After the skin is under control, the soaking is stopped but the nighttime smears with an ointment or moisturizer should continue.</td>
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<td><strong>Soak</strong></td>
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<td>In a bath (not a shower) in plain water for 20 minutes (use a timer) at night, THEN smear immediately, without drying the skin, with the ointment containing ... (steroid) for ... days. For hand dryness and cracking, soak your hands continuously in a pan of water for 20 minutes at night and follow with the smearing as above. After the skin is under control, the soaks at night can be stopped. But continue to smear the ointment each night. Throughout the treatment period you can apply ... cream to the worst areas in the morning. The soaking will allow water to go into the skin and hydrate it, then smearing on the ointment will (1) trap the water in the skin (because water cannot move through oil) and moisturizes the skin and (2) allow the anti-inflammatory ingredient in the ointment to get deep into the skin.</td>
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<td><strong>Maintenance Treatment: Prevent Drying/Irritation</strong></td>
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<td>Repeated wetting (ie, baths, showers, swimming) without moisturization will actually dry out the skin more. So when showering or washing your hands, it is necessary to apply a moisturizer such as petroleum jelly always available for more intense moisturization at night.</td>
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<td><strong>Soap</strong></td>
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<td>Using soap in the shower can further dry out the skin by removing the oils the skin naturally produces. There are three types of glands found in the skin. The sebaceous gland produces an oily substance, called sebum, which is the body’s natural moisturizer. The sebaceous glands are found over most of the body with the highest amount on the face and upper trunk and the fewest on the arms and legs. These latter places are usually the sites that become dry the earliest. The second kind of gland is the eccrine sweat gland, which produces sweat when we are hot. The sweat that is made has the same consistency as water, so it will be removed from your skin when water (no soap needed) runs over your skin in the shower. The third gland is the apocrine gland. This gland is responsible for producing the odor known as “body odor.” The apocrine glands are found only in the armpits and groin, not on the arms or legs. Therefore, you can get clean and help your skin by limiting the use of soap to the armpits and groin. You should then pat dry (preferably leaving some water on the skin surface) and apply moisturizer. This should be the way you shower from now on to help prevent future breakouts.</td>
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response, 1 had an 80% response, and 1 had a 75% response. Generally, time to clearance varied with severity of the dermatitis, but most cases cleared within several days to 2 weeks of therapy.

In patients with a severely compromised skin barrier, our experience is that sometimes aggressive nontopical therapy with prednisone, intramuscular triamcinolone, or cyclosporine fails; however, in these same patients, aggressive topical treatment reproducibly leads to clearing of the patient’s signs and symptoms. Moreover, many times, soak and smear therapy is successfully done with the same topical corticosteroid that failed in the patient in the past when it was simply applied topically even with occlusion, but without prior soaking (Figure 1 and Figure 2).

Even in our severely afflicted referral population, if the technique is followed, our overall experience is that more than 90% of patients have a 90% to 100% clearance, and the condition of only 1 has worsened. Aggressive widespread topical corticosteroid treatment will result in increased absorption. We have not seen evidence of systemic effects, such as moon facies, fat redistribution at other sites, or indication of glucose intolerance or infection; however, if continued for a month or longer, purpura at sites of trauma, usually of the upper extremities, may be seen. Many patients are older, have thinned skin secondary to age and long-term solar damage, and are already predisposed to such purpura. We limit the need for long-term use by teaching maintenance techniques.

Soaking and smearing complement each other well, working to restore and maintain normal skin barrier function. Soaking serves the important purpose of removing crust and scale while also hydrating a damaged stratum corneum. A healthy stratum corneum that is elastic and pliable requires a water content greater than 10%, with an ideal water content ranging from 20% to 35%. The stratum corneum can absorb as much as 5 to 6 times its own weight and increases its volume 3-fold when soaked in water. Hydration of the stratum corneum, as with bathing, leads to increased distance between corneocytes and, consequently, to decreased intercorneocyte bonding and cohesion forces, enhancing desquamation. In addition, an adequate water content in the stratum corneum is required for enzymatic activity, leading to normal cornodesmosomal cleavage and desquamation.

While the stratum corneum absorbs water well, it does not bind water well. Smearing then has a 2-fold function of (1) trapping the moisture in the stratum corneum and (2) delivering the topical medication that is smeared. A topical medication will penetrate a damaged barrier better than it will penetrate an intact barrier and will penetrate a moist stratum corneum from 10 to 100 times more effectively than it will penetrate a dehydrated stratum corneum. Also, because soaking aids in desquamation, topical medications have a thinner stratum corneum to traverse immediately after bathing than they do before bathing. Soaking and smearing is more complicated than attracting and trapping water. The end result of successful soak and smear therapy is decreased transepidermal water loss and enhanced hydration, more effective penetration of the active anti-inflammatory medication, and exfoliation of a damaged skin barrier—it is “corneotherapy” at the most basic level. Just as a downward spiral of disease worsening occurs with dryness and hyperkeratosis followed by decreased efficacy of therapy, increased hydration and desquamation with soaking followed by occlusive ointment application results in escalating improvement because of improved penetration of medications.

Smearing after showering does not lead to the described improvements, just as short soaks will not. Soaking in chlorinated pools or hot tubs does not work and often induces irritation. The technique can obviously not be used if the patient cannot get into and out of a bathtub. There is no need to add anything to plain water soaks, and petroleum jelly is adequate for smearing in cases that are not accompanied by inflammation or as maintenance or bridge therapy to simple moisturizers. The soak and smear therapy is time consuming and messy, but with detailed education about the technique, it is frequently possible to avoid systemic medication and the accompanying adverse effects.

Soak and smear therapy is usually only needed for several nights to 2 weeks, with conversion to mainte-
maintenance treatment initiated once the acute process is calmed. The regimen is tapered by first smearing without soaking, then stepping down to using the morning moisturizer at night and during the day. Part of the maintenance therapy is also educating patients about the hazards of soap and water and of wetting and drying the skin. From the initial encounter, education regarding the need to reduce the use of soap and increase the use of moisturizers is necessary, with phrases such as “from now on you should not think that you have finished washing your hands until a moisturizer is applied.” When treating hand dermatitis, it is suggested that patients obtain multiple push-top dispensers for use at all sinks of the home and bring moisturizers to the workplace. The time taken to educate the patient and give written educational materials is especially helpful during instances of recurrence. These patients tend to have flares of their dermatitis, but they are educated about the cause and the treatment, and can reinstate the regimen, knowing that relief is only several nights of soaking and smearing away.

Accepted for Publication: May 4, 2005.
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Author Contributions: Dr Gutman had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. Study concept and design: Gutman, Kligman, Sciacca, and James. Acquisition of data: Gutman. Analysis and interpretation of data: Gutman and James. Drafting of the manuscript: Gutman and Sciacca. Critical revision of the manuscript for important intellectual content: Gutman, Kligman, Sciacca, and James. Administrative, technical, and material support: Gutman, Sciacca, and James. Study supervision: James.

Financial Disclosure: None.

REFERENCES