Treatment of plantar hyperkeratosis with a combination 10% urea and 8% glycerin topical cream

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BACKGROUND

A recent market research study revealed that among all households with a female interviewed, 29 percent claimed that either they or another female in the household experienced dry, flaking, or cracked feet not believed to be associated with athlete’s foot. This condition, plantar hyperkeratosis, is often seen as thickened, dry skin on the heel of the foot with more severe cases exhibiting fissures and bleeding. Often, the more severe cases harbor a fungal infection (moccasin tinea pedis) that can be confirmed by scraping and KOH or a fungal culture. Causes for plantar hyperkeratosis are many and include genetic defects reflected in skin structure, allergic dermatoses, and paraneoplastic syndromes seen with particular forms of internal malignancy. One form of plantar hyperkeratosis, keratoderma climactericum, is seen in some women during menopause. Many remedies include moisturizing agents, emollients, and exfoliating agents used to facilitate the removal of thickened skin and promote healing. Frequently, high concentrations of urea, up to 40%, are used but result in topical products that are unpleasant to use and reduce compliance and, therefore, efficacy.

OBJECTIVE

To evaluate the efficacy of a 10% urea and 8% glycerin topical formulation in treating dry, cracked feet (plantar hyperkeratosis).

METHODS

Twenty-nine men and women with dry, cracked feet were recruited. At the beginning of the study and prior to treatment, the condition of each foot of each subject was graded according to a photo atlas severity scale. A description of each severity grade is shown in Table 1.

TABLE 1: GRADING SCALE DESCRIPTIONS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>Fine details, smooth, may have wrinkles, but not dry.</td>
</tr>
<tr>
<td>1</td>
<td>Dry lines, slight scaling, and skin thickening.</td>
</tr>
<tr>
<td>2</td>
<td>Small fissures, moderate scaling, and skin thickening.</td>
</tr>
<tr>
<td>3</td>
<td>Deep fissures, obvious scaling, and skin thickening.</td>
</tr>
<tr>
<td>4</td>
<td>Small gaps on fissures, severe scaling, and skin thickening.</td>
</tr>
<tr>
<td>5</td>
<td>Big gaps and openings on fissures, bleeding, extreme scaling, and skin thickening.</td>
</tr>
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</table>

All subjects were given an ample supply of the test article and instructed to apply a liberal amount to the heels of both feet twice each day for the duration of the study. The study ran for eight weeks. The test article was a topical formulation containing 10% urea and 8% glycerin in a cream emollient base.

RESULTS

All participants demonstrated remarkable improvement in the condition of their feet. Examples of improvement are shown in Figures 7-9 (these are the pairs of feet, before/after photos). Researchers noted improvement increased based on severity; the more severe the condition, the greater the improvement. Improvement was evident after four weeks of treatment and continued through the end of the study (Figure 10). Fissures and calluses were eliminated, skin was softer and more hydrated, and subject survey data disclosed that all subjects noticed an improvement by week four and that 88 percent found the formulation to be effective. Numerous participants claimed that either they or another female in the household experienced dry, flaking, or cracked feet not believed to be associated with athlete’s foot. This condition, plantar hyperkeratosis, is often seen as thickened, dry skin on the heel of the foot with more severe cases exhibiting fissures and bleeding. Often, the more severe cases harbor a fungal infection (moccasin tinea pedis) that can be confirmed by scraping and KOH or a fungal culture. Causes for plantar hyperkeratosis are many and include genetic defects reflected in skin structure, allergic dermatoses, and paraneoplastic syndromes seen with particular forms of internal malignancy. One form of plantar hyperkeratosis, keratoderma climactericum, is seen in some women during menopause. Many remedies include moisturizing agents, emollients, and exfoliating agents used to facilitate the removal of thickened skin and promote healing. Frequently, high concentrations of urea, up to 40%, are used but result in topical products that are unpleasant to use and reduce compliance and, therefore, efficacy.

REFERENCES