Barrier Cream Cloth Efficiency and Prevention of Transepidermal Water Loss—An Important Consideration in Product Selection

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P R E S E N T E D A T T H E

INTRODUCTION AND RATIONALE

In establishing evidence for skin barrier efficacy afforded by products that utilize disposable wipes for leave-on application, Transepidermal Water Loss (TEWL) is a well-accepted method for assessing skin barrier efficacy.

OBJECTIVE

With product effectiveness as a critical component to clinical decision-making, the aim of this study is to examine the differences in ability to prevent TEWL by four currently-marketed barrier wipes that vary in dimethicone concentration (0% to 3.6%) and that utilize leave-on application.

METHODS

The barrier efficacy of four barrier products used as wipes for leave-on use was tested against a model chemical irritant, Artificial Urine prepared via the method described by Larner et al and used for leave-on application. Sodium Lauryl Sulfate (SLS) 1% was applied in a similar manner as the positive control.

Each site was assessed by the standard measure, TEWL, over a 7-day period. Thirty adult volunteers were studied, and each volunteer had daily application of each skin barrier test product (25 to 35 in. x 1.5 in.) and Artificial Urine. The study was performed for 7 days in random assignment to each skin site using an occluded patch (8 mm Finn Chamber on Scrape tape). Sodium Lauryl Sulfate (SLS) 1% was applied in a similar manner as the positive control. Two separate sets of sites that were not treated with a barrier test product were exposed to either the Artificial Urine or one site at the SLS positive control at another site. The control negative site (no product application) was also randomly assigned and measured. All test site measurements were performed by blinded, trained assessors. Positive and negative controls supported the validity of the testing methodology.

TEWL is the standard measure performed to obtain evidence for skin barrier efficacy.

RESULTS

Daily applications of each skin barrier test product (wipe) yielded a greater skin barrier efficacy for Product B than for all other products (A, C, and D), as evidenced by TEWL measurements on skin sites exposed to Artificial Urine. Product B showed no net water loss when used on skin exposed nearly continuously to Artificial Urine after daily re-applications over the 7-day duration of the study.

<table>
<thead>
<tr>
<th>Test Product</th>
<th>TEWL (g/hr/m²)</th>
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<tbody>
<tr>
<td>Artificial Urine</td>
<td>2.11</td>
</tr>
<tr>
<td>Product A</td>
<td>0.944</td>
</tr>
<tr>
<td>Product B</td>
<td>0.300</td>
</tr>
<tr>
<td>Product C</td>
<td>0.756</td>
</tr>
<tr>
<td>Product D</td>
<td>1.580</td>
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</tbody>
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Note: The result for the negative control (no irritant or barrier test product application) was -1.412 (no net water loss).

DISCUSSION

Evidence gained from this testing helps to demonstrate that skin barrier efficacy is dependent on the entire product formulation, and specifically does NOT necessarily correlate with the percentage concentration of an individual ingredient such as dimethicone. A product with inadequate skin barrier efficacy is more likely to fail in achieving institutional compliance with IAD Guidelines and likely to serve the needs of the patient. As such, a clear distinction is demonstrated between the 4 commercially available barrier wipes as test products in assessing the level of barrier efficacy as measured by TEWL after Artificial Urine exposure. The product concentration of dimethicone as a skin protectant proved NOT to be a sole determinant for skin barrier efficacy. Rather, as described in the IAD Guidelines, the product performance characteristics, including barrier effectiveness, dictate the optimal choice for the practitioner and the patient.

This study underscores the importance of evaluating product performance characteristics for similarly marketed barrier products.

REFERENCES


PRODUCT B demonstrated lower skin water loss than Products A, C, and D. Remarkably, under testing conditions, there was no net skin water loss with Product B, even after prolonged, and nearly continuous, skin contact with Artificial Urine using daily re-applications over a 7-day period. In contrast to the evidence of skin barrier effectiveness for Product B, study findings showed significantly higher net skin water loss for Products C and D, the other two wipes containing dimethicone.

As such, a clear distinction is demonstrated between the 4 commercially available barrier wipes as test products in assessing the level of barrier efficacy as measured by TEWL after Artificial Urine exposure. The product concentration of dimethicone as a skin protectant proved NOT to be a sole determinant for skin barrier efficacy. Rather, as described in the IAD Guidelines, the product performance characteristics, including barrier effectiveness, dictate the optimal choice for the practitioner and the patient.

This study underscores the importance of evaluating product performance characteristics for similarly marketed barrier products.

Understandably, there is an important need to obtain evidence-based information to adequately assess skin barrier efficacy afforded by one product in comparison to others. It remains for the practitioner and the user to be able to determine that the selected product provides the expected skin barrier effectiveness, a product characteristic that is not communicated by simply reading the ingredient listing and reviewing the concentration of ingredients on the product label.