Objective

Compare and contrast the performance of various dimethicone-containing products designed to cleanse, moisturize and provide a barrier effect.

Methods

An independent laboratory conducted a comparative study of four incontinence barrier cloths or wipes containing dimethicone over filter versus a negative control (filter only) by quantifying the volume of artificial urine (as method of Brook) passing through a nylon filter in order to determine relative in-vivo barrier-effectiveness for each test article.

The testing environment was controlled for temperature and humidity as specified in ISO 554-1976(E). For all filter housings (#2-5, Figure 1) a uniform amount of each test article, consistent with intended application to skin, was placed on top of a nylon-filtered beaker, using circular uniform application of the test article for 30 seconds. Weights were obtained before and after application of each test article to the filter. The control nylon-filtered beaker received no application of a test article. The control nylon-filtered beaker received no application of a test article. The nylon filter, consistent with intended application to skin, was placed on the top surface of a beaker and the volume of artificial urine passing through the filter was measured over time for each test article. These data were recorded and then graphically portrayed in Figure 1 to demonstrate the amount of artificial urine passing through the filters over time. Simple samples were run for each test article and control.

Results

The control beaker showed that at 50% of artificial urine passed through the filter, indicating no barrier effect. As expected, test articles 2 and 3 showed little difference over time in the amount of artificial urine passing through the filter versus the control. At 120 minutes (2 hours), the testing showed nearly 80% of the artificial urine had passed through the filter for test articles 2 and 3. Additionally, at 480 minutes (8 hours), essentially all of the artificial urine had passed through the filter for test articles 2 and 3, representing little difference compared to the control. Test article 4 performed slightly better than the control and test articles 2 and 3, as well as 60% of the amount of artificial urine passing through the filter at 480 minutes (8 hours).

Contrary to all other comparators, test article 5 allowed 10-times less artificial urine at the 120 minute (2 hour) mark compared to the control. At 480 minutes (8 hour) mark, test article 5 allowed 3 times less artificial urine than test articles 2 and 4, and more than 5 times less artificial urine than the control and test articles 2 and 3. The data Trends of volume by filter time for each test article is shown in Figure 2—volume versus time for each test article.

Conclusions

After comparing and contrasting dimethicone-containing products for barrier effectiveness, test article 5 considerably outperformed all other comparators by allowing only a small amount of artificial urine to be filtered, even after a full 8-hour period equivalent to a work-shift while all other comparators allowed considerably more artificial urine to be filtered.

This study underscores the important aspect of comparing and contrasting product formulations of similarly marketed barrier products and that the presence of a skin protectant such as dimethicone has been shown to be an effective barrier effect in just one aspect of product utilization. Clearly, there is an unmet need for additional evidence-based information to adequately assess barrier-effectiveness for one product formulation versus another. In order to determine characteristics when choosing products designed for barrier effectiveness.

This study is consistent with previously published expert consensus guidelines regarding IAD and suggests there remains an unmet need for barriers clinicians in order to differentiate barrier effectiveness and product performance characteristics when choosing products designed for barrier effectiveness.

Discussion

It is essential to consider overall product formulation and delivery method in order to make a comparison of products containing more than one barrier effect. The decision to choose a product should be based on the entire product formulation and its performance as a barrier.

FIGURE 1: Beaker with Nylon Filters

FIGURE 2: Volume by Filter Time for Each Test Article (mL)

ARTIFICIAL URINE PASSING THROUGH FILTER: Volume vs. Time

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Comparison of Skin Barrier Effectiveness for Products Containing Dimethicone

Introduction & Rationale

Incontinence associated dermatitis (IAD) is a condition that exists in the healthcare setting and is caused by urine or stool irritants coming into contact with skin. Clinically, patients present as irritated or normal skin irritants that may vary from minor redness to severe dermatitis, resulting in redness, irritation or even ulceration of the skin. The most common risk factors for IAD are low-irritant, pH-neutral, barrier-containing cleansing product is consistent with the most effective strategy to maintain skin barrier function and integrity.

An international consensus panel of experts published evidence-based guidelines for the prevention and treatment of IAD. As summarized, clinicians have access to a wide range of products, each of which is labeled as a cleansing, moisturizer, barrier, skin protectant, and barrier barrier moisture barrier. Skin care products are classified and regulated by the US Food and Drug Administration (FDA) based on 3 categories—prescription drugs, over-the-counter drugs, and cosmeceuticals. In addition, many clinicians select skin care products based on the category listed on the front of the package—eg, antibiotic, moisturizer, barrier, etc—without regard for the ingredients.

Notably, dimethicone is often used as a protective ingredient in skin barrier products because of its generally accepted skin protectant properties. However, skin protectant properties and barrier effect of such product formulations containing dimethicone vary widely.

To further address these issues of product formulation performances, we determined the relative barrier effectiveness of various dimethicone-containing products by utilizing in-vivo filter testing.

Objective

Compare and contrast the performance of various dimethicone-containing products designed to cleanse, moisturize and provide a barrier effect.