Investigating the absorbency effects of LBF barrier cream

KEY WORDS
- Absorbency
- Incontinence
- Moisture
- LBF barrier cream

Maintaining skin integrity and managing the microclimate around the skin is of paramount importance. Incontinence products such as pads or full bed mats are often used in order to absorb moisture and maintain a dry environment around the skin. Another method of protecting the skin from moisture contact is to apply a barrier cream; this is routinely done by healthcare professionals and carers. Some reports have suggested that the use of a barrier cream will hinder the efficacy of any products designed to move moisture away from the skin interface and, therefore, the use of both products in conjunction may limit their performance for their intended purpose. There are several different formulations of barrier cream commercially available for use, with various active ingredients that produce a protective barrier between the patient's skin and moisture. This can either be a paste-type application or a film-type formulation that dries and leaves a protective barrier. This study aimed to identify whether there is a performance limitation of absorbent incontinence products following the application of a selection of commercially-available barrier creams and to identify whether LBF barrier cream varies significantly with respect to other barrier creams. All of the creams were found to have similar effects on incontinence pad performance, with the absorbency of the incontinence products not being significantly affected by the transfer of cream. The LBF barrier cream product compared favourably with the other commercially available formulations.

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The skin is the largest organ of the body, comprising 15% of the body's weight and consisting of three main layers — the outer epidermis, the middle dermis and the subcutaneous tissue. It provides the following functions:

- Protection against damage to internal tissues
- Provision of a barrier to infection
- Act as a pain receptor
- Maintenance of body temperature
- Production of vitamin D in response to sunlight and production of melanin.

The ability to effectively manage moisture is essential when attempting to promote skin integrity and prevent the development of moisture-associated lesions in all ages, from the very young to the older person. Skin may be damaged as a result of exposure to excessive moisture; this type of damage is defined as a moisture lesion, moisture ulcer, perineal dermatitis, diaper dermatitis, moisture-associated skin damage and incontinence-associated dermatitis. Through the ageing process the skin changes, making it vulnerable to damage caused by excessive moisture and trauma (Wounds UK, 2012); therefore close inspection of the skin in individuals who are assessed as being at risk of skin damage can lead to the identification of reduced skin integrity and damage through moisture, pressure, shear and friction.

Proactive protection of the skin from maceration and excoriation should be a priority of clinical care, with regular skin inspection and cleansing and protection regimes being implemented and documented. Excoriation is defined as damage to the mucous membrane, whereas maceration is defined as a softening or over-hydration of the tissue due to retention

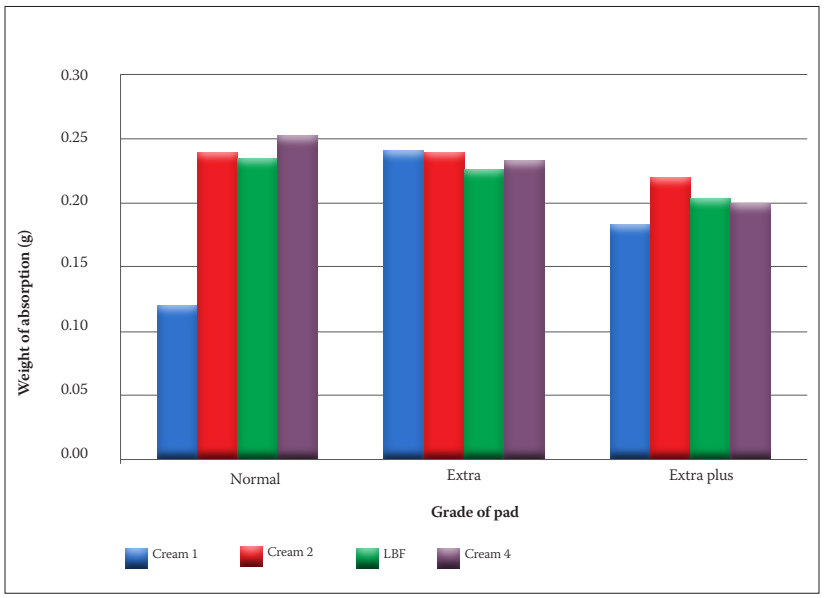

Figure 1. Cream transfer for each grade of pad

of excessive moisture (Cutting, 1999). Many healthcare practitioners, carers and family members will use barrier creams to help prevent skin damage. However, little is known about whether the creams themselves can obstruct the function of incontinence aids, including pads and their absorbency. There are numerous skin barrier products available in a range of formulations: sprays, foam applicators, films and wipes. Films can be applied to broken or irritated skin without stinging, however care should be take with those that contain alcohol as stinging may occur. Films dry quickly to create a breathable and transparent film, providing a protective water-repellent barrier against irritants and excessive moisture caused by faeces, urine and perspiration (Beldon, 2013). There is, however, little evidence exploring the effect these products have upon incontinence products and if, indeed, these products can impede the efficacy of incontinence body pads.

A study undertaken by Hart (2002) investigated cream transfer and pad absorbency between four different creams. The results highlighted that products such as zinc and castor oil and Sudocrem had a greater effect on the performance of the incontinence products, reducing the absorbency capacity compared to Cavilon cream. The methodology used in the current study has been adapted from that used by Hart (2002) and expanded to incorporate other variants, such as thickness of the incontinence pad. This was done to determine whether the effects barrier cream were enhanced or reduced when used in conjunction with different absorbencies of pads. The methodologies used for each of the studies are outlined in full below.

EVALUATING THE USE OF LBF BARRIER CREAM

The objective of the study was to investigate whether LBF barrier cream had a significant effect on the absorbent capacity of commonly-used incontinence pads compared with other commercially-available barrier products. No ethical approval was required for this evaluation.

Methodology

A blind study was conducted with four different barrier products selected from anecdotal evidence as commonly-used products. LBF barrier cream, 3M Cavilon cream, Sudocrem and Proshield Plus. Two key tests were completed to assess the effects of barrier creams on incontinence pads. These tests measured the amount of cream transferred to the incontinence pad from the patient's skin, and the effect of that cream transfer on the absorbent capacity of the incontinence pad.

Initial tests were carried out using standard absorbency pad. The tests were then repeated using 'extra' and 'extra plus absorbency' bed pads.

Test 1 – Cream transfer and absorbency of synthetic urine

Measured amounts of barrier cream were applied to the volar forearm of three participants. The participants were a female aged 36, and two males aged 22 and 53. For each participant, 0.4 g of the cream was applied evenly over a mapped area of 6 cm × 6 cm. Measured sections of incontinence pads were applied to the area for 6 minutes at a constant pressure and the amount of cream transferred was detected using precision gravimetric measurement, where a precision balance was used to weigh the samples before and after and calculations were performed. The study mimicked constant pressure between the pad and participant and also the movement of the participant where participants were asked to move the pad around while maintaining

contact with the skin. This was done to show potential difference in effects with mobile and immobile patients.

Following the assessment of cream transfer, measured amounts of synthetic urine were applied to the pad at the skin/pad interface. The pad was further compressed and agitated for 5 minutes in order to mimic the patient/pad interface during use and then the volume of fluid absorbed was assessed, again using precision gravimetric assessment.

Test 2 – Absorbency threshold tests

Barrier cream transfer was simulated using the same method of cream application to the volar forearm. Following assessment of cream transfer, the absorbency characteristics of the pad areas were assessed using a drip test method. Synthetic urine was applied to the pad sections in measured amounts, one measure at a time until saturation occurred. The volume of fluid retention was then assessed using the gravimetric assessment methods in order to determine the performance characteristics of the pads following potential cream transfer for each of the formulations investigated.

Results

Results showed that performance of LBF barrier cream was consistent with the other market-leading creams tested. From *Figure 1* it can be seen that less of the LBF barrier cream was transferred to the pad during the initial phase of the testing, indicating that the cream remained on the skin of the participant and was able to fulfil the role of providing a barrier to moisture for the skin.

Test 1 – Cream transfer and absorbency of synthetic urine

The cream transfer tests (*Figure 1*) demonstrated that the amount of cream transferred from skin to pad was as much influenced by the grade of pad (standard, extra and extra plus absorbency) as it was by the type of cream. LBF compared favourably for each of the pads tested. The results from the urine absorption tests following cream transfer showed again that there was a markedly bigger influence from the grade of pad used than the barrier cream applied.

In each of the tests, LBF barrier cream performed well, typically being ranked second (*Figures 1* to *4*). The cream that ranked first differed for each test, showing that LBF barrier cream performed more consistently. Cream 1 performed worst in each case. It should also be noted, that the amount of cream transferred did not necessarily mean that absorbency was reduced with the same ranking. For example, with cream 1 the results showed that less cream was transferred to the pad; however *Figure 2* shows that it was the worst performing in terms of urine absorbency.

Test 2 – Absorbency threshold tests

The absorbency threshold tests were performed using only the highest absorbency incontinence products (extra plus). *Figure 5* shows the results of an average of three repeats. The results show

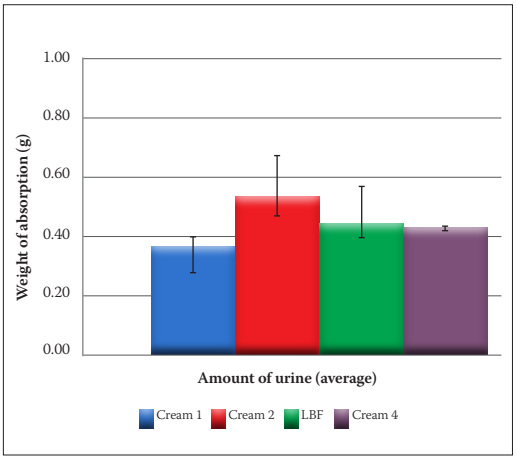

Figure 2. Urine absorption for each cream with normal absorbency pads

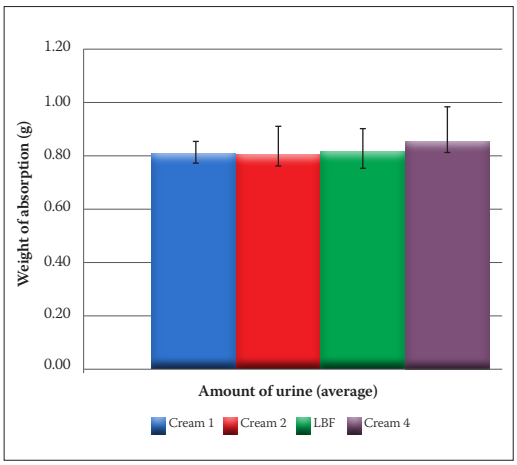

Figure 3. Urine absorption for each cream with extra absorbency pads

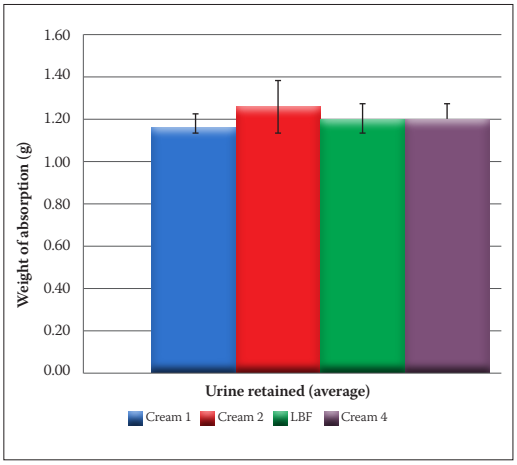

Figure 4. Urine absorption for each cream with extra absorbency pads

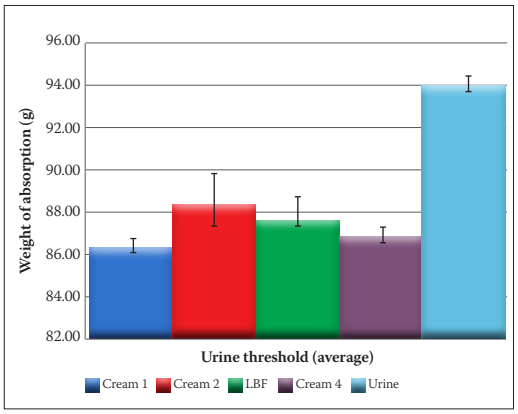

Figure 5. Urine threshold results (urine refers to the pad with no cream application)

little variation in the results, indicating good repeatability of results.

In all cases the absorbent capacity of the pads was affected by the transfer of barrier creams by up to 8%. The barrier creams were all comparable, with cream 2 and the LBF barrier cream performing the best in terms of retained absorbency.

DISCUSSION

The efficiency of incontinence pads was affected by all of the creams trialled; however the LBF barrier cream performed favourably and although there was some change in absorbency of the pads, this did not detract from the transfer of moisture away from the skin, indicating that the use of barrier creams does not significantly impact incontinence products. For the extra plus grade incontinence pads, there was far less variation in the results, showing that the use of barrier cream had less marked effect on absorbency.

Rafter (2014) explored the effects of TENA pads on the transfer of moisture from the pad to the skin. Her results showed a reduced prevalence of moisture lesions in those patients where the higher grade of pad was used. This clearly highlights the importance of tissue viability and continence specialists working closely together to ensure that appropriate products are chosen to promote skin integrity. Similarly, all staff involved in promoting skin integrity should ensure that the choice of barrier and absorbency products are recorded in the patient's notes. When a patient requires effective management of excessive moisture, consideration should be given to early referral to the continence as well as the tissue viability team.

CONCLUSIONS

There is cream transfer to incontinence pads at the skin interface in all four creams tested. There is a reduction in absorbency for all of the pads with cream transfer. LBF barrier cream performed favourably in the cream transfer, urine threshold and absorbency tests. The effect cream transfer is reduced with higher-grade absorbency pads. The benefits of using an effective barrier cream outweigh the reduction in the performance of incontinence pads, particularly when used in conjunction with higher absorbency pads. WUK

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