

ADERMA™ HEEL PADS IN THE PREVENTION OF PRESSURE ULCERS IN NURSING HOMES

Aderma™ (Smith and Nephew) Dermal Pads are designed to help prevent skin damage through the redistribution of pressure. This evaluation examined one type, Aderma Heel Pads, on the prevention of pressure ulceration and the reversal of existing skin damage in a nursing home population. Skin status was monitored visually by nurses, as well as through the use of quantitative grading scales and ultrasound scanning. The results show that Aderma helped to reduce erythema and prevent progression of skin damage. Ultrasound findings suggest that Aderma returned skin to a 'normal' status, when compared with unaffected surrounding skin. Carers and residents reported no adverse reactions to Aderma and it was generally found to be an intuitive, easy-to-use product. On the basis of these findings, Aderma Dermal Pads are considered to be a valuable technology in the prevention of pressure ulcers in nursing homes.

Pressure damage is a common problem in nursing homes and can cause a significant morbidity for residents. A recent audit of 16 care homes in the UK reported a pressure ulcer prevalence of approximately 19% (87 pressure ulcers among 458 residents) (Kingsley et al, 2010), while studies from the USA indicate that the risk of pressure ulcers on admission to hospital is five times greater in those admitted from nursing homes than from other settings (26% versus 5%) (Keelaghan et al, 2008).

As well as the increased morbidity associated with these ulcers, there is also the economic impact of increased carer time and admissions to hospital. The financial impact of pressure ulcers to the NHS has been well documented, with treatment costs for a grade 4 ulcer running to around £15,000 (Dealey et al, 2012). A number of guidelines are available to support the prevention of pressure ulcers, including guidance from the European

Pressure Ulcer Prevention Advisory Panel (EPUAP)/National Pressure Ulcer Advisory Panel (NPUAP) in the USA (EPUAP/ NPUAP, 2009) and the National Institute for Health and Clinical Excellence (NICE, 2005).

These guidelines highlight the importance of prevention and the relatively simple steps that can often be taken to help reduce the risk and incidence of pressure ulceration. Fundamental nursing practices, such as identifying risk factors for pressure ulceration, monitoring skin damage and repositioning individuals accordingly, are all critical steps in prevention. Technology also has a role to play in prevention. Pressure-relieving surfaces have been shown to be one means of reducing pressure damage (Nixon et al, 2006), although access to such surfaces may be limited in care home settings.

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Aderma™ Dermal Pads (Smith and

Key words

- ▶▶ Aderma
- ▶▶ Pressure ulcer
- ▶▶ Prevention
- ▶▶ Nursing home

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Table 1
Erythema grading scale

Points	Scale
1	No difference from surrounding skin
2	Just perceptible difference (diffuse mild erythema without defined borders)
3	Uniform erythema with sharply defined borders
4	Bright red colour with slight induration (oedema) on palpation
5	Bright red colour and pronounced induration (oedema) raised above surrounding skin

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Nephew) are a novel technology, designed to help reduce pressure damage and contribute to pressure ulcer prevention. Aderma comprises a range of gel pads that redistribute pressure when used on bony areas, such as the heel and sacrum. Aderma is available in a range of sizes and shapes, including sheet and strip pads, which can be cut to size, as well as shaped heel and sacrum pads. *In vitro* studies have shown that Aderma can reduce peak pressure by up to 89% (Data on File — Smith and Nephew), while dermal pads have been shown to reduce hospital-acquired pressure ulcers by 68% (Woods, 2012).

One of the benefits of Aderma in the care home setting is that it is 'intuitive' to use and can be easily incorporated into existing care pathways. It is a simple solution that nurses could hold in stock to place on any 'at risk' heel. Furthermore, the product can be washed and reapplied on the same individual, meaning that it can be used to manage periods when residents may be at elevated risk of pressure ulcers, for example, due to immobility as a result of falls or trauma injuries.

In order to establish the acceptability of Aderma to patients and clinicians, as well as its efficacy, a non-comparative evaluation was conducted across three nursing homes in East Sussex, England. The study evaluated the effect of Aderma Heel Pads on both the prevention of pressure ulcers and the reversal of existing skin damage.

METHODS

Patients

All residents of the chosen nursing homes were eligible for inclusion in the study. Residents with existing damage to the heel (EPUAP grade 1) and a Waterlow pressure ulcer risk assessment score in excess of 15, were eligible for inclusion. Altogether, the team assessed 25 residents, following a list provided by the care homes of patients with reddened heels. 15 were recruited. Others were excluded if they had wounds or the redness did not constitute non-blanching pressure damage.

Two residents who were eligible, but were unable to give their approval to participate in the evaluation, were

excluded. A further three residents were enrolled into the evaluation but subsequently lost to follow-up due to hospitalisation. However, data collected on these individuals at initial follow-up visits is included in the analysis. All residents were immobile or had low levels of mobility.

Monitoring

At the first visit to each site, residents were identified and asked to provide consent to participate in the evaluation. Both heels were reviewed, with the heel with the worst level of pressure damage being assigned to the treatment group. The other heel was considered as the control and treated with standard nursing practice. After the enrolment, follow-up visits were conducted after one week, one month and two months. At each visit, the status of the skin on both heels was reviewed visually by the evaluation team, digital photography and also by ultrasound.

An Episcan (Longport Inc) ultrasound scanner was used, which operated at a frequency of 20MHz, giving an axial resolution of 65µm. The scanner is an objective and non-invasive method of studying the healing status or the pressure damage that may be occurring and has been designed to provide information on the body's largest organ, the skin. It provides a scientific measurement of healing that occurs between two assessment points over a period of time. The picture provided by the scanner is similar to a biopsy, where the layers of skin can be examined although the picture from this scanner is non-invasive. The scanner is assessing dermal water.

Scans were conducted of the affected skin as well as the surrounding area, to provide an assessment of the resident's 'normal' skin status. Image analysis software was used to identify the level of oedema within the dermal tissue, relative to the surrounding normal skin. Scans were analysed using pixel distribution, whereby pixels below a certain intensity are classed as low echogenic pixels (LEP).

The ratio of LEP to the total pixel count (LEP:TPC) has been shown to reflect changes in the dermal water content (Young et al, 2011). This provided a quantitative assessment

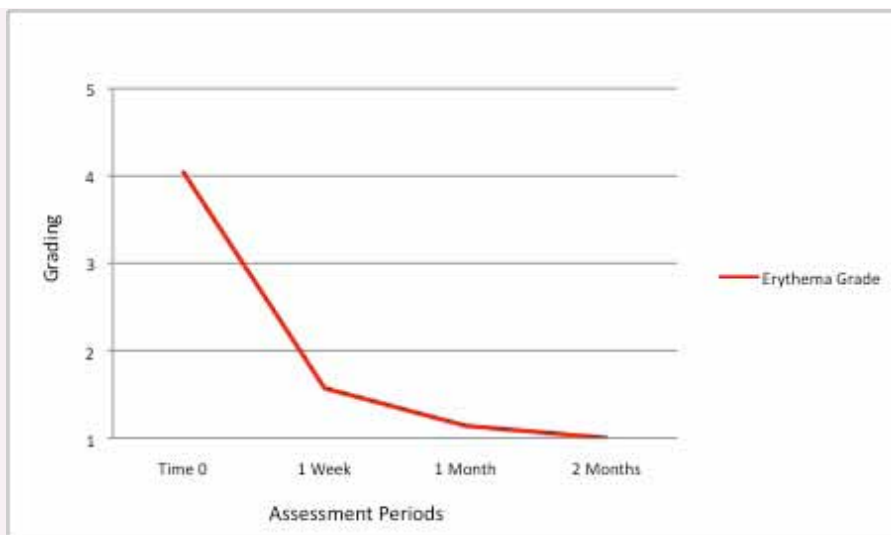


Figure 1: Erythema grading scale.

of the level of oedema present in the damaged tissue.

Skin status was monitored at follow-up visits to determine whether it had worsened, remained the same or improved, relative to baseline. An erythema grading scale was developed for this purpose, which allowed for quantification of skin status at baseline and subsequent visits. This is presented in Table 1.

Data were collected from all eligible residents and analysed using standard statistical techniques.

RESULTS

Erythema levels

Based on the grading scale presented above, the median erythema level across all eligible residents at baseline was 4.04. Following treatment with Aderma, this reduced significantly and rapidly as illustrated in Figure 1.

After just one week of treatment, the median erythema score had fallen to 1.57, a 61% improvement from baseline. This continued to decline with continued treatment, to a median of 1 at two months' follow-up. Nurses also reported a visual improvement over time with skin becoming less oedematous and improving in colour — the evaluation was of heels displaying redness. The visual assessment that nurses were asked to make was based on the changes in redness, i.e. by the second assessment

had the redness improved/deteriorated or was it static?

Ultrasound findings

The LEP:TP ratio was plotted over time — for each patient visit, including baseline at week zero, week one, month one and month two.

Once the 15 patients had been recruited to the evaluation, both heels were scanned. Firstly over good skin to provide a comparative baseline, and then over the area of redness. Once the heel with the most inflammation was identified by scanning, it was included to the study. The second heel was used as a control with the same process of scanning undertaken. The LEP:TP ratio of the surrounding skin was 0.26–0.28. This was adopted as the target range for the affected skin following treatment.

Figure 2 shows the results of the LEP:TP ratio in both the Aderma-treated heels as well as the control heels over the course of the evaluation.

The results show that at baseline both the affected heel and the control had a compromised LEP:TP ratio, reflecting the skin damage present at recruitment (note, this is worse in the Aderma-treated population as the worst heel was allocated to the treatment group). Over the course of the first week, the Aderma-treated heel improved significantly, reaching the target LEP:TP ratio and remaining within the target range over the course of the study. In contrast, the control heel treated with standard nursing care remained elevated over the course of the evaluation.

User evaluation

Carers found Aderma to be intuitive and easy to use, which was reflected in almost complete compliance with usage protocols outlined in the evaluation.

Carers reported some splitting of the Aderma Heel Pads with continued use over time, although it should be noted that this did not occur at critical off-loading areas of the pad and had no noticeable effect on product performance. There were no adverse reactions reported as part of the evaluation.

Anecdotally, residents reported higher levels of comfort while using Aderma,

References

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reflecting the reduction in inflammation reported above.

DISCUSSION

This evaluation considered the effect of Aderma in reversing the progress of skin damage on the heel and preventing the incidence of pressure ulceration.

The study considered a range of endpoints, including quantitative grading of skin damage using an erythema scale, nurse reported outcomes and ultrasound.

On all endpoints, residents treated with Aderma experienced improved outcomes over time. The level of erythema, reported from visual observation, as well as the quantitative scoring scale, improved significantly and rapidly and was maintained for the course of the evaluation. These findings were corroborated by the ultrasound findings, which reported improvements in skin status in heels treated with Aderma and not present in heels that were treated with current standard nursing practice.

The findings suggest that Aderma has a significant role to play in reversing low-level skin damage and preventing the progression of skin damage to pressure ulceration.

It is important to note that these results were generated in a care home setting. Care homes residents are typically at elevated risk of developing pressure ulcers (Keelaghan et al, 2008). Furthermore, the expertise and knowledge of wound care among carers operating in care homes may vary substantially with many having only limited training in the management of wounds and requiring more education (Taylor, 2001).

The benefit of Aderma in this setting is that it is an intuitive technology that most nurses can easily understand with minimal training and incorporate into their existing care protocols with little, if any, disruption. Furthermore, the fact that Aderma dermal pads can be reused on the same patient means that there is only a modest impact on carer time, relative to alternative pressure-relieving devices that often need frequent replacing or repositioning following movement or bathing.

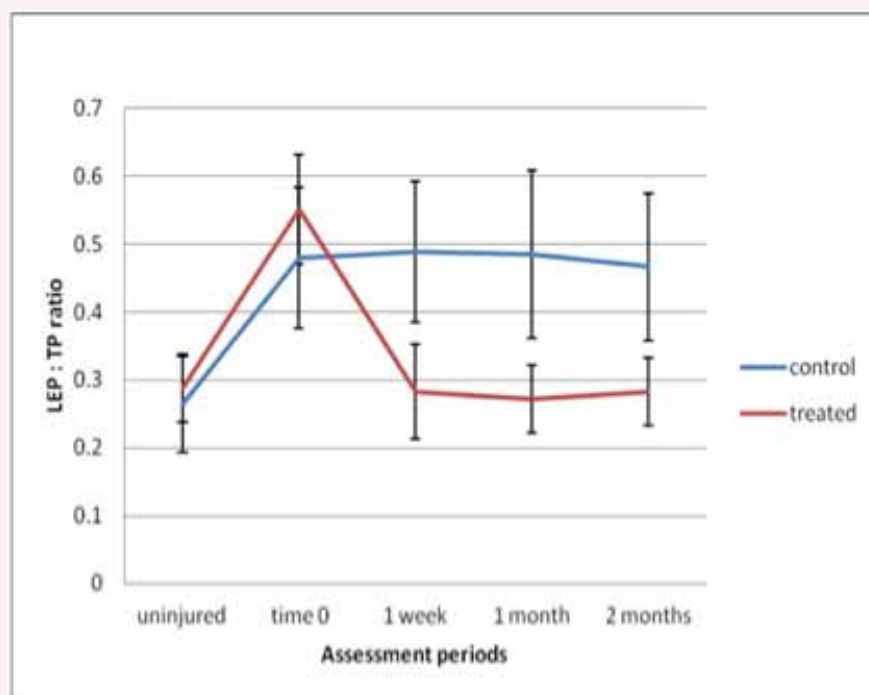


Figure 2: LEP:TPC ratio over time.

Finally, the modest cost of Aderma, relative to pressure-relieving surfaces, makes this an attractive prevention strategy for nursing homes (depending on size and shape, the cost of an Aderma pad, suitable for multiple uses on a single patient, ranges from around £6 to £16 and is available on prescription through the Drug Tariff).

CONCLUSION

Clearly, it needs to be acknowledged that Aderma, when used in isolation, is not a panacea for pressure ulceration in nursing homes. As with any technology, it needs to be incorporated into best practice protocols, comprising appropriate positioning and monitoring of residents.

However, the findings of this evaluation corroborate similar studies in both hospital (Woods, 2012) and nursing homes (Large, 2011), and seem to indicate that Aderma has a significant role to play in the prevention in pressure ulcers. **WUK**

CONFLICT OF INTEREST

This evaluation was funded by Focus Product Developments (FPD). ADERMA is now marketed by Smith & Nephew, Hull, United Kingdom