The importance of addressing pain and infection simultaneously in diabetic foot ulcers

This is a report from a symposium held at the *11th Annual Conference and Exhibition of The Diabetic Foot Journal*. The meeting took place on 6 October 2010 at the Hotel Ibis, London. The symposium and this report were sponsored by Mölnlycke Health Care.

Pain in the diabetic foot is often neglected, despite being the major cause of distress for people with ulceration. The purpose of this symposium was to discuss the burden of pain associated with dressing changes and infection, and to look at how advanced wound care products might simultaneously address these burdens. The Chair of the meeting was Paul Chadwick (Principal Podiatrist, Salford Primary Care Trust), and the speakers were Keith Cutting (Principal Lecturer, Buckinghamshire New University), Samantha Haycocks (Advanced Podiatrist, Salford Royal NHS Foundation Trust) and Phil Davies (Global Clinical and Scientific Information Manager, Mölnlycke Health Care).

Paul Chadwick welcomed the speakers and introduced Keith Cutting, the first speaker.

Keith described the approach that he and Richard White (Professor of Tissue Viability, University of Worcester) had taken in exploring the relationships between wound infection, pain and dressings – the Delphi method. The Delphi method is a technique for achieving consensus whereby information on a given topic is collected from a panel of key opinion leaders through a series of questionnaires. The answers provided are then refined following statistical input and the formation of subsequent rounds of questions. Panel members do not know who their co-members are, a blinding that avoids the risk of dominance by individual members (for more information on the Delphi method, see Jones and Hunter [1995]).

The objectives of this particular investigation were to determine correlations between infected wounds and increased pain or sensitivity, report on the impact of dressings and antiseptics on the somatic and operative influences of that pain and identify clinician responses to event-related episodes of pain. In addition, the panel were asked to rank treatments in relation to wound infection and pain based on their clinical experience. The panel consisted of experts from a range

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of countries, the majority from the UK and USA. Nurses and physicians made up 20 of the 21 experts.

After a series of questionnaires and revisions the expert panel returned four main conclusions. They found a strong correlation to exist between wound infection and pain. They also held that topical antimicrobials can be a cause of wound pain, as well as a treatment for one cause of wound pain – that is, associated with the onset of wound infection. "Traditional" adhesive dressings were identified as being a common cause of wound pain. Finally, silicone dressings were identified by the group as the most effective dressing in avoiding or reducing wound pain. A full report of the Delphi panel findings will be published in due course.

Next, Samantha Haycocks presented a case study series that evaluated the signs and symptoms of local infection in diabetic foot ulcers when using a silver-containing, soft silicone foam dressing (Mepilex® Ag; Mölnlycke Health Care, Gothenburg, Sweden).

Samantha began by reminding the delegates that wound pain in the diabetic foot is often underestimated – especially in those with neuropathic and neuroischaemic ulcers (Bengtsson et al, 2008). The case series she reported was primarily designed to detect change in the signs and symptoms of localised infection in ulcers treated with Mepilex® Ag, but secondary outcomes comprised assessment of pain levels associated with dressing changes, reduction in wound size, investigator's opinion on dressing performance and adverse events.

Figure 1. The symposium in progress at the **11th Annual Conference of the Diabetic Foot**, *London. On the stage are (left–right) Samantha Heycocks, Phil Davies, Keith Cutting and Paul Chadwick (Chair).*

The case study series was conducted among 15 in- and outpatients with diabetic foot ulceration treated at Salford Royal NHS Foundation Trust. At each dressing change, investigators were asked to record a score of "none", "mild", "moderate" or "severe" for pain (measured by a visual analogue pain scale before dressing removal, at removal and at dressing application), erythema, exudate level, oedema and heat in the target ulcer.

By week 4, no target ulcers received a score above "mild" for any of the measured areas, except exudate level. This was a marked improvement from baseline. Results for the visual analogue pain scale also revealed a large drop for pain scores reported by patients for before dressing removal, during dressing removal and during dressing application. Furthermore, the investigators reported that their overall experience using the dressing was either good (3/15, 20%) or

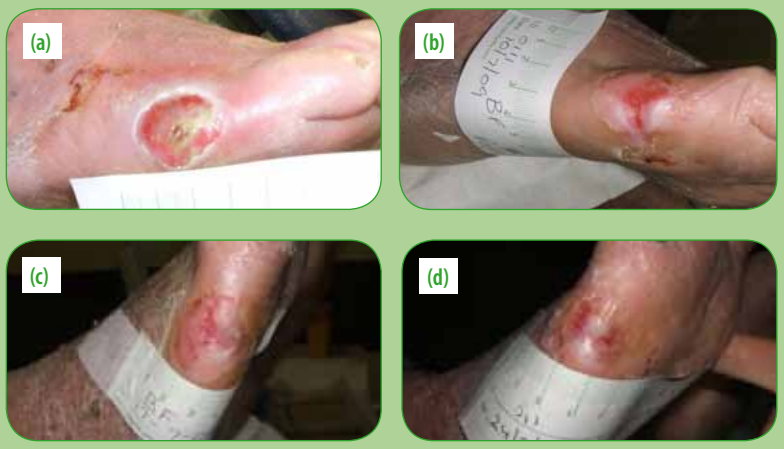
very good (12/15, 80%).

Samantha concluded that the results of the case study series suggest that Mepilex® Ag resolves signs and symptoms of localised infection and simultaneously addresses the issues of pain and trauma during dressing application and removal. She also provided the delegates with two case reports from the case study series, one of which is reported in *Box 1*.

Box 1. CASE REPORT: Mr F

Mr F has type 2 diabetes, neuropathy, allergic dermatitis and numerous antibiotic intolerances. He developed an ulcer over the lateral aspect of the 5th metatarsophalangeal joint (a). Mr F presented with localised erythema and a high level of exudate and wound pain. Due to Mr F's numerous antibiotic intolerances he could not be treated with oral agents and a hospital admission for intravenous antibiotic therapy would have been necessary if the infection were to deteriorate.

Mepilex® Ag was commenced in conjunction with good wound care and Mr F, and his wound, were monitored closely. At 1 week post-presentation, Mr F's wound had reduced in size and exudate level (b). Signs and symptoms of infection had markedly reduced by week 2 (c) and Mr F's wound was epithelialised and progressing to complete healing by week 3 (d).



The final speaker of the symposium was Phil Davies. Phil discussed dressing- and infection-related pain, then went on to look at how advanced wound dressings can reduce these burdens.

Phil began by highlighting that, although the European Wound Management Association (EWMA, 2002) and the World Union of Wound Healing Societies (WUWHS, 2004; 2007) have found the issue of wound pain during dressing-related procedures important enough to warrant the publication of consensus documents, the burden of wound-related pain remains under-acknowledged in clinical practice. Price et al (2008) report an international survey (>2000 people with active wounds; 15 countries) on wound-related pain. The authors found that >50% of those surveyed experienced pain at dressing change "quite often", "most of the time" or "all of the time". Perhaps most concerning, >40% of the participants indicated that pain at dressing change is the worst part of living with a wound.

Pain is also associated with infection and is, itself, an important barrier to healing. Proinflammatory modulators released during wounding increase local pain and delay healing, with pain-related stress decreasing the immune system's response (White, 2009). Thus, there is a need for atraumatic dressings that incorporate broad-spectrum antimicrobial agents to simultaneously address pain and infection.

Phil next described the use of Safetac®

technology (as used in the Mepilex® and Mepitel® ranges; Mölnlycke Health Care) to produce such dressings. Safetac® technology allows a dressing to adhere to dry skin, but not to moist wound surfaces, thus reducing tissue damage – and, importantly, pain – on removal (Thomas, 2003; Cutting, 2008). This is illustrated by the comparison of the wound contact surfaces of a traditional acrylic adhesive dressing (*Figure 2a*) and a dressing with Safetac® (*Figure 2b*) after removal from the skin of volunteers when examined under an electron microscope. The comparison highlights the substantial amount of cellular material attached to the surface of the traditional adhesive dressing after application for 72 hours, whereas the Safetac® surface appears free of epidermal cells (Waring et al, 2008).

White (2008) published the results of a multinational clinical evaluation of 3030 people with a variety of wound types. The participants were transferred from traditional adhesive dressings to dressings with Safetac® and then surveyed on the intensity of wound-related trauma and pain. It was found that dressings with Safetac® were associated with reduced trauma to wounds and peri-wound skin and were associated with a significant (P=0.01) reduction in dressing change-related pain (measured before, during and after dressing change) compared with the previously used traditional adhesive dressings.

Paul concluded the symposium by thanking the speakers for their interesting presentations. Finally, he reminded delegates of the link between wound pain and infection and that advanced wound dressings are able to address both these concerns and so reduce the burdens of diabetic foot ulceration. ■

Bengtsson L, Jonsson M, Apelqvist J (2008) Wound-related pain is underestimated in patients with diabetic foot ulcers. *J Wound Care* **17**: 433–5

Cutting KF (2008) Impact of adhesive surgical tape and wound dressings on the skin, with reference to skin stripping. *J Wound Care* **17**: 157–62

European Wound Management Association (2002) *Position Document: Pain at Wound Dressing Changes*. MEP, London

Jones J, Hunter D (1995) Consensus methods for medical and health services research. *BMJ* **311**: 376–80

Price PE, Fagervik-Morton H, Mudge EJ et al (2008) Dressing-related pain in patients with chronic wounds: an international patient perspective. *Int Wound J* **5**: 159–71

Thomas S (2003) Atraumatic dressings. *World Wide Wounds*. Available at: bit.ly/hENIc4 (accessed 01.12.10)

Waring M, Rippon M, Bielfeldt S, Brandt M (2008) Cell attachment to adhesive dressings; qualitiative and quantitiative analysis. *Wounds UK* **4**: 35–47

White R (2008) A multinational survey of the assessment of pain when removing dressings. *Wounds UK* **4**: 14–24

White RJ (2009) Wound infection-associated pain. *J Wound Care* **18**: 245–9

World Union of Wound Healing Societies (2004) *Principles of Best Practice: Minimising Pain at Wound Dressing–Related Procedures. A Consensus Document*. MEP, London

World Union of Wound Healing Societies (2007) *Principles of Best Practice: Minimising Pain at Dressing–Related Procedures: "Implementation of Pain Relieving Strategies"*. WoundPedia, Toronto

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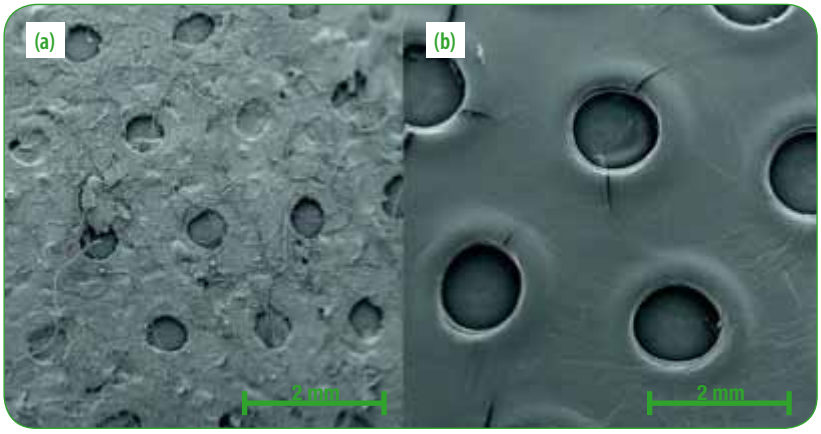

Figure 2. Comparison of wound dressing surfaces using an electron microscope. (a) Traditional acrylic adhesive dressing and (b) Safetac® surfaces following 72 hours of wound contact. Note the large number of epidermal cells on the surface of the traditional acrylic adhesive dressing, while the Safetac® surface is free of epidermal cells (Waring et al, 2008).