THE USE OF A SURFACTANT IRRIGATION SYSTEM FOR THE TREATMENT OF CHRONIC, INFECTED HARD TO HEAL LEG/FOOT ULCERS

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Introduction

Management of chronic foot/leg ulcers in patients with diabetes can be both difficult and challenging. They are common, difficult to treat and result in more hospital bed days than any other complication of diabetes (Reiber, 1998). Foot infections in patients with diabetes are the leading cause of non-traumatic lower extremity amputations in developed countries (Lipsky, 2004).

It has been suggested that the presence of biofilms can significantly contribute to the chronicity of these wounds (Wolcott, 2008). A biofilm can be described as a microbial colony encased in a polysaccharide matrix which can become attached to a wound surface. They can affect healing due to the production of destructive enzymes and toxins which promote a chronic inflammatory state (Bjarnsholt et al, 2008). The eradication and removal of biofilms in chronic wounds should ideally be achieved via regular debridement as they are considered to be generally impenetrable by conventional antibiotic therapy. However, appropriate and regular wound debridement is not always practical and clinicians should consider alternative and more effective long term biofilm eradication methods.

The aim of this poster is to evaluate the clinical efficacy of a surfactant irrigation system (Prontosan®, B. Braun), which contains Polyhexanide (PHMB) and Betaine, for the treatment of chronic, locally infected diabetic ulcers where the presence of biofilms were suspected.

Case Study 1

Mrs M, an 82 year old Type 2 diabetic lady was admitted to hospital in September 2008 with infected/painful right foot ulcers.


Picture 1

Medical History: Diabetes of 10 years duration, chronic mild renal impairment (serum creatinine 150), cardiac pacemaker fitted 7 years previous, under active thyroid 40 years duration – treated Thyroxine. History of recurrent bilateral leg ulcers for 25 years – treated with compression therapy. Left leg below knee amputation in October 2007. Minor trauma sustained to the dorsum of her right foot during this admission. The lesion continued to deteriorate slowly over the next 10 months – increasing in size and pain.


Picture 2

Intervention: In September 2008 Mrs M was admitted to hospital due to acute clinical infection of the right foot ulcer with MRSA and Pseudomonas, and was commenced on IV Vancomycin and Meropenum. The foot was very painful and the high exudate levels from the ulcer resulted in skin sensitisation and subsequent skin erosion (Picture 1 & 2).


Picture 3

Pain was managed with oramorph 5-10 mg prn and fentanyl lozenges 400mcg were used for dressing changes. After three weeks of IV antibiotics and topical antimicrobials, the wound clinical infection showed no significant improvement. A Vascular and Dermatology opinion was sought and diagnosis of the presence of biofilm was suggested.


Picture 4

The ulcers were commenced on daily Prontosan® soaks followed by application of Prontosan® Gel beneath a nonadherent dressing (Siltex). The patient was also commenced on low dose steroids (prednisolone) to help reduce inflammation and mild compression therapy (Elset 18-20 mmhg) to reduce oedema.


Picture 5

Results: Positive results were noted within 1 week of commencement on this regime (Picture 3). After 2 weeks pain levels were significantly reduced and dressing changes were able to be performed without analgesia. After three weeks clinical progress remained continuous and the patient was discharged home with daily input from District Nurses and weekly out-patient followup appointments. After 3 continuous months (December, 2008) of this regimen progress was sufficient that it was deemed appropriate to stop the prednisolone, but continue with the Prontosan and mild compression therapy (Picture 4). After a further 3 months (March, 2009) the ulcers continue to make progress and have remained infection and pain free (Picture 5).

References
1* Morrison J, Moffat CJ & Mosby P F (2007) Leg Ulcers: A Problem Solving Approach (Edited by Moya. Page IX)
2* Thomas JG, (2008) Association for the Advancement of Wound Care (AWWC) Advancing Your Practice: Understanding Wound Infection and the Role of Biofilms Article

Case Study 2

Mrs C, a 63 year old lady was admitted to hospital with a 3 month history of deteriorating left leg ulcer.


Picture 1

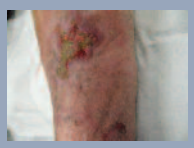
Medical History: Ischaemic heart disease, hypertension, previous TIA's, and diagnosed on admission with pre-diabetes. History of recurrent bilateral venous leg ulcers. Left leg had re-ulcerated 3 months previous and continued to deteriorate during this time, increasing in size and pain.


Picture 2

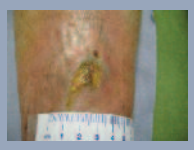
Intervention: During her hospital admission Mrs C had 3 separate courses of IV antibiotics in conjunction with various topical antimicrobial dressings due to the presence of persistent clinical infection. Pain was managed during dressing changes with diclofenac, oxycodone and oxynorm. Mrs C also underwent angiography of the left leg which resulted in an 8mm balloon angioplasty and stenting of the superficial femoral artery. She was then discharged with silver dressings and compression bandages but was re-admitted 4 weeks later with leg cellulitis and worsening ulceration.


Picture 3

Pseudomonas aeruginosa was isolated from the wound swab and she was commenced on the appropriate antibiotics. Due to the persistent nature and clinical appearance of this wound infection the presence of biofilm was suspected (Pictures 1 & 2).


Picture 4

The ulcer was commenced on the daily Prontosan® Irrigation System and reviewed twice weekly by the tissue viability team.


Picture 5

Results: The patient reported a reduction in pain after only a few applications of the Prontosan® Irrigation and Gel. A reduction in the level of exudate was also noted within 1 week and positive changes in wound size and quality were noted after 2 weeks. Compression therapy was re-commenced and dressing changes were reduced to three times weekly (pictures 3 & 4).

Within 4 weeks of commencing the Prontosan® Irrigation System considerable improvement was noted both at the wound level and the patients overall quality of life. At this stage she was able to be discharged home with twice weekly dressing changes. The ulcer continued to improve over the next four months to a point of almost fully healed (Picture 5).

Conclusion

The Prontosan® Irrigation System has helped to produce favourable outcomes in both of these high risk complex wounds. It appears to have contributed significantly to aid and reduce the bio-burden of these wounds and the level of associated pain and exudate. To date, both patients continue to make progress and it is anticipated that this system will be used continually until full healing is achieved.