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Oxyzyme™: an oxygen releasing dressing

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Abstract:

Sylvie Hampton, Andy Kerr & Cathie Bree-Aslan discuss the use of oxygen on intractable wounds and describe three case studies using Oxyzyme™
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The concept of wound bed preparation heralded a new era in terms of how wounds are treated as it emphasised the difference between acute and chronic wounds, and cemented the idea that the processes involved in the healing of acute wounds do not apply completely to the healing of chronic wounds (Panuncialman & Falanga, 2007).

Wound bed preparation demanded a more scientific approach to healing wounds and led to development of new and exciting modalities in wound care such as Oxyzyme™. Oxyzyme™ is a new concept based on an old principle that the presence of oxygen is necessary for normal wound healing. This article provides information on oxygen and wound healing and demonstrates Oxyzyme™ efficacy through a series of 10 case studies undertaken by Tissue Viability Consultancy Services as part of a larger national study of 67 patients.

Oxygen & wound healing

For many years, oxygen has been given as a therapeutic modality to assist and speed wound healing (Rodriguez et al., 2008). Although the old repudiated method of 'egg white and oxygen' thankfully went out of fashion some 20 years ago it is still thought that oxygen alone is required to start or sustain other wound healing processes (Rodriguez et al., 2008). Today, delivery of oxygen to the wound is generally through hyperbaric oxygen and topical oxygen although there is evidence to suspect that the use of pressure and systemic pure oxygen may not be essential in wound care (Panuncialman & Falanga, 2007). Use of sub-pure systemic oxygen under normobaric conditions may significantly minimise the risk of oxygen toxicity associated with other methods of delivery (Gordillo & Sen, 2003).

Certainly, topical oxygen has no detrimental effects on wounds and shows beneficial indications in promoting wound healing (Kalliainen et al., 2003; Sen et al., 2002) and one study suggested that brief exposures to pure oxygen not only helped chronic intractable wounds heal faster and completely but also reduced scarring (Ohio State University, 2003).

Wound healing is a cellular and biochemical process, which relies essentially on an inflammatory reaction. The components of blood that are responsible for the inflammation contain chemical mediators that encourage wound repair, this means that wound healing is a natural process of regenerating dermal and epidermal tissue. Therefore, it is certain that the dressings do not heal wounds as this is the role of the body. Nevertheless, provision of an ideal wound healing environment can

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Figure 1: Mrs A is an 87 year old lady who is a resident in a local nursing home. Her past medical includes Diabetes mellitus type 2, hypertension and rheumatoid disease. The current wound is an undiagnosed mixed aetiology leg ulcer situated on the lateral aspect of the left leg proximal to the malleoli. This ulcer has been present for at least 12 months and for the last four weeks has been treated with a hydrogel

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Figure 2: Wound is healing well with excellent granulation and epithelialisation occurring

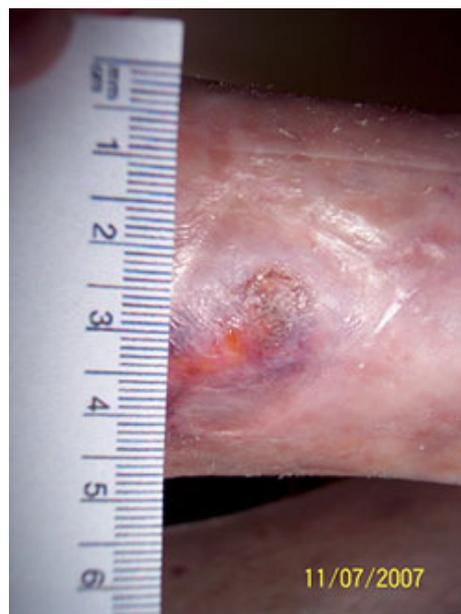


Figure 3: Wound of 12 months duration that has healed in less than seven weeks

promote wound healing, and providing the ideal environment through clever selection of the most appropriate dressing, such as Oxyzyme™, relies on the skill of the nurse who is caring for the wound.

Oxyzyme™

Oxyzyme™ is a hydrogel wound dressing which is designed to promote healing in dry to medium exudating and superficial wounds. Oxygen from the atmosphere diffuses into the dressing and is converted to hydrogen peroxide by the dressing's enzymic action. This diffuses through the dressing to the wound surface where it is instantly converted back to dissolved oxygen. The hydrogen peroxide is also used to create a low level of iodine within the dressing. The dressing therefore changes from colorless on application, to gold after one to two hours. The low level of iodine provides an anti-microbial effect and the delivery of oxygen helps support wound healing and suppress anaerobic bacteria. A case study programme in Canada and the UK have demonstrated the safety and effectiveness of Oxyzyme™.

The case study programme is part of a two year, multi-centre and international programme, which will include up to 200 patients suffering from wounds, using a 10cm * 10cm sheet hydrogel wound dressing. Patients are screened for eligibility and their informed consent is obtained prior to their entry into the study.

To date, 67 wounds have been evaluated using Oxyzyme™. The results are that 10 per cent (seven) of the wounds treated healed in under six weeks, six per cent (four) healed in 6-16 weeks with a further 52 per cent (35) improving or showing some improvement during the course of the case studies. The outcome was a total of 68 per cent of wounds healed or improved.

Ten case studies undertaken by Tissue Viability Consultancy Services as part of this large study, were on patients with wounds that had been unhealing for five years on standard therapy. All ten case studies are reported on as part of the larger study. This article is a report on the outcomes of three of those case studies.

The case studies

Aims of the evaluation

The primary overall aim of this clinical evaluation was to evaluate the ability of Oxyzyme™ therapy in providing a healing environment in intractable wounds.

Methods

The patients were provided with Oxyzyme™ dressings and the dressing change was undertaken each time by Tissue Viability Consultants. Photos were taken before, weekly during, and at the completion of the therapy and the wounds measured. Wounds were considered healed once they were completely covered with epithelial tissue.

Discussion

These wounds were all intractable and yet all wounds changed to healing status in a very short period of time. The changes were startling and can only be related to the dressing. It would be difficult to state categorically that it was due to the oxygen that is released into the wound. However, the results merely reflect the results of efficacy that are being identified in the main large study.

One identified problem is that in wounds that are likely to bleed, they will be more inclined to bleed when Oxyzyme™ is used. This is the same with any of the sheet gels. One possible theory for this is that there is no calcium within the gel sheets, and it is possible that calcium could be leached from the local tissues, reducing the potential for the clotting cascade. Nevertheless, when bleeding does occur, if the dressing regime

is halted for a few days, it can then be safely resumed.

It is certainly the author's experience that wounds rapidly change in structure when Oxyzyme™ is applied. The wound often swells and takes on the appearance of soft overgranulation. This rapidly resolves and generally only lasts for one or two dressing applications. It does seem to herald the healing phase in these normally intractable wounds.

Conclusion

Given that 68 per cent of intractable wounds in the major study have healed and linked with the results of the case studies above, leads the authors to suggest that Oxyzyme™ is a dressing that should be considered in all wounds that have poor or no healing.

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