THE EFFECT OF THE ENVIRONMENT ON MODERN WOUND DRESSINGS

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ABSTRACT

Introduction
Modern wound management dressings rely on both absorbency and moisture vapour transmission rate (MVTR) to create a moist wound healing environment. Dressing companies often quote these figures added together to give a total fluid handling capacity value for their products. A common feature of these standard methods is to incubate test samples at a set temperature and very low relative humidity; however, it has been shown that changes in temperature and relative humidity will affect the MVTR of semi-permeable films.

Method
BS EN 13726:2002 test methods for primary wound dressings parts 1.2. In addition to the standard procedure and as a deviation, the test was replicated at different temperatures and relative humidities, 25°C/60%RH and 40°C/75%RH, in validated storage equipment.

Results
This study shows that differences in temperature and relative humidity can have a profound effect on how a dressing performs.

Discussion
Standard test methods provide a useful benchmark for companies to compare their dressings but these standards do not necessarily reflect how the dressings may perform in a clinical setting.

Conclusion
Dressings that rely on having a very high MVTR to provide their total fluid handling will be more susceptible to environment conditions than those which do not. This knowledge should be an important consideration when making dressing choices.

Results

Temperature and Humidity in a Clinical Setting

In order to see how temperature and humidity may vary in a clinical setting a series of measurements was taken at Glasgow Royal Infirmary. Having established that no ethics committee approval was needed as there was no direct patient contact, a temperature and humidity probe was used to take readings in different locations in different wards.

Conclusion and Discussion

This study has shown that when carrying out a standard test but at different environmental conditions the Total Fluid Handling of modern dressings may be very different. Dressings that have a relatively high MVTR in comparison to their absorbency are most adversely affected. As the relative humidity rises then MVTR pays a much lower contribution to the overall performance of the dressing.

The investigation at Glasgow Royal Infirmary is interesting it demonstrates that the temperature throughout the wards remains relatively consistent but the relative humidity can vary significantly (p<0) from ward to ward.

The relationship between relative humidity and temperature is a complex one and both values will vary day to day due to normal atmospheric conditions. It is difficult to make direct comparisons between the laboratory data and how dressings will perform in a clinical setting. What may be concluded from this study, however, is that dressings will not necessarily perform in the exact way a manufacturer states from conducting standardised testing.

Additional note: All dressings selected for similar indication

1 BS EN13726:2002 Test methods for Primary Wound Dressings Parts 1.2.
2 ASTM E 866/ E M 05
3 S. Thomas et al., The effect of temperature and humidity on the permeability of film dressings. JJWC 2011, volume 20

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