ADVANCES IN THE USE OF MEBO (A NEW APPROACH IN THE METHOD OF APPLICATION)

Ait-Aissa M., Habib Medical Center, Riyadh, Kingdom of Saudi Arabia

SUMMARY. The new product presented must be understood as an advance in the use of MEBO (moist exposed burn ointment) and a new presentation that allows an extension of the field of applications and indications. Clinicians engaged in wound care today face a challenge that is growing in both magnitude and complexity. An estimated 25 million patients require costly therapeutic management for acute or chronic wounds every year in the USA. In the year 2030, more than 20% (60 million) of all Americans will be over the age of 65, and many of these will be institutionalized, immobile, and therefore prone to difficult-to-treat decubitus or pressure ulcers. The concept of gauze impregnated with ?sitosterol used as a semi-permeable dressing offers a new approach in wound management.

Introduction

*Healing is a matter of time, but it is sometimes also matter of opportunity? (Hippocrates).*

With the aim of finding a systematic approach to wound management optimizing the safety and efficacy of wound care, a research project was carried out based on the use of a semi-permeable dressing as a support for,?-sitosterol.

The concept of moist healing, as an improvement on dry dressings, triggered a revolutionary approach in wound management. In 1958 Odland noted that a blister healed faster when kept intact.1 Winter demonstrated that the epithelialization rate in wounds occluded with polyethylene film was twice as rapid.2 Hinman and Maibach reproduced these findings in humans. In the early 1970s Rovee showed that a moist crust-free environment enhanced the migration of epithelial cells across the wound.3 In vivo and in vitro studies have also demonstrated the benefits of various occlusive (moisture-retentive) methods.4

The term “occlusive”may be confusing. Although it is commonly used as a synonym for “moisture-retentive” the occlusive characteristics of moisture-retaining dressings vary widely, ranging from semi-permeable dressings that permit gas exchange to dressings that are completely occlusive and virtually impermeable.

The effectiveness of wound management depends on the moisture-retentive quality of the dressing. Other factors (molecular and cell biology) open the door to an entirely new dimension in wound care.

The concept of “broad-spectrum healing” introduced by the Julphar Company and the development of the technique pioneered by Xu-Rongxiang, which uses natural herbal extracts as an exposed burn ointment, brought about a revolution in wound management.

Local factors affecting wound healing

Tissue repair requires local factors that are optimal for epithelialization, collagen formation, angiogenesis, and wound contracture. The local factors5-9 include:

- micro-organisms
- foreign bodies, necrotic tissue, eschar
- desiccation
- pressure, friction, and shear
- oxygen (changes in O2 tension)
- inefficient fibrin breakdown
The optimal conditions of temperature, hydration, oxygenation, and waste removal appear to be provided by MEBO (moist exposed burn ointment). However, in daily practice - especially in out-patient treatment - some inconveniences have limited MEBO’s application.

**Limitations in the application of MEBO**

In the usual method of treatment with exposed dressings, the patients complain of the rapid wiping-off of the substance owing to friction against clothes and bedding. This is especially common in paediatric use. There are two alternatives. The first is to use a thin layer of dressing, in which case the substance is rapidly absorbed, becoming dry and difficult to change. This is a dangerous manoeuvre, and we need something less harmful. The other alternative is a more frequent use of the substance, but what will be the cost to the patient? The odour of the substance is not well tolerated by some patients, and this is another essential parameter if we have to consider maximum comfort.

**Dressing effects on wound healing**

Dressings serve a variety of functions in wound healing. They protect the wound from physical trauma, drying, and foreign matter; they also shield the wound from the micro-organisms that might contaminate it.

Pain relief and odour control are other possible benefits that a dressing can offer. Wound exudates can be managed by the use of a fluid-absorbing dressing. The dressing can also help to debride the wound by maintaining a moist environment. The use of impregnated tulle-gras gauze and other similar dressings promotes the absorption of wound exudate and the physical removal of surface necrotic tissue. If such dressings are kept moist, their healing effects equal those of other dressings; however, it is difficult to keep them moist. In addition, gauze probably does not provide a bacterial barrier and if it is removed after drying on the wound, this may remove viable tissue and thus delay wound healing.

The need to solve these problems has led to the idea of supplementing the positive effects of MEBO and dressing with the benefits of a “semi-permeable” dressing.

The new technique is a breakthrough in the use of MEBO: it extends the duration of the moist environment and solves the problem of wound exudates by means of absorption. The patients are more comfortable and at the same time physicians are facilitated in their daily practice.

**Method description: “Gauze impregnated with ,-sitosterol”**

The concept of the use of gauze impregnated with Vaseline or paraffin is very well known (e.g. tulle-gras® with or without antibiotics, Sofratulle®, and Bactigras®).

In daily practice its indications are limited, mainly because of its tendency to dryness and its overlong epithelialization phase, which often requires the use of topical “corticotulle” corticosteroids.

With the intention of solving these problems, a research project was initiated in 1999 involving the use of gauze impregnated with ,-sitosterol ointment.

**Experimentation**

**A. Laboratory**

Experiment No. 1: Effect of temperature on,-sitosterol ointment: -sitosterol + autoclave 135°C for 7 min and 121°C for 20 min.

A substance was obtained, which we named “X”

Experiment No. 2: Effect of temperature on gauze impregnated with ,-sitosterol.

Material M1.

Experiment No. 3: Effect of temperature on gauze impregnated with ,-sitosterol.

Added to substance Y.

Material M2.
B. Trials in patients
Experiment No. 4: Use of classic MEBO compared with substance X.
Experiment No. 5: Use of classic MEBO compared with material M1.
Experiment No. 6: Use of classic MEBO compared with material M2.

C. Experiments to adjust the ideal characteristics of the gauze and the dosage of the added substance Y

D. Comparison of efficacy (M1 versus M2)

E. Cost of wound care using material M2

Results
- Significant advantages were observed with the use of material M2 compared with that of classic MEBO, including acceleration of the healing process, maintenance of a moist environment not adhering to the wound, and easy removal during dressing changes (even after two days). All these benefits facilitated the migration and proliferation of epithelial cells, as also wound resurfacing.
- The effect of the autoclave did not compromise the characteristics of ?sitosterol, allowing better impregnation and sterilization.
- Wound care is a costly burden both to individuals and to the health care system. It was estimated that more than $1.5 billion was spent on wound care in 1990. This figure excludes antibiotics and other pharmaceutical agents. Wound care, like all other aspects of medical practice, has been affected by reimbursement systems designed to reduce the cost of patient care. Such systems promote a shift from hospital care to home care whenever possible, and early hospital discharge is also encouraged. To meet these demands, clinicians are becoming familiar with an increasing number of new modalities that not only hasten wound healing but also are easy to use in the home setting.
- Greater patient comfort was achieved by a reduction in the number of visits to the clinic, minimization of pain during dressing changes (non-adhesive), and reduction of the smell of ?sitosterol. These aspects were more appreciable in paediatric use. The cost of the material M2, in my practice, was about $US 3 per sheet (10/15 cm). Two weeks?treatment of the same surface cost US$ 26.5

Limits of the research project
It is impossible to achieve perfection in science, and our research in these last two years has encountered certain limits. Further studies are necessary in order to develop the concept.

Objectives for the future
- Work in the laboratory, in collaboration with engineering experts
- Development of the product on an industrial scale
- Determination of the best course of treatment
- Development of a framework for prediction of the time course and the cost of managing specific wounds.

Bibliography