

Using a Horseshoe Shaped Glycerine Based Dressing to Protect Patients From Pressure Sores

Nursing Research Institute
Rogier Hörchner
Manager Surgical Cluster, 1997
Red Cross Hospital
Vondellaan 13, NL-1942 LE Beverwijk

Summary

It is well established that pressure sores often develop after a patient has been on the operating table for an extended period of time. The treatment of pressure sores is a very costly one and in some cases, pressure sores can cause the death of a patient. In a retrospective study over the years 1995-1996 we have reviewed over 9000 patients in the medical wards and over 9000 patients in the surgical wards with respect to the preventive effects of the *Elasto-Gel™* horseshoe shaped dressing as compared with hydrocolloid dressing in the Red Cross Hospital in Beverwijk, the Netherlands.

Medical patients were preventively treated with hydrocolloid dressings and special beds. Surgical patients were treated either with horseshoe shaped hydrocolloids or with *Elasto-Gel™* horseshoe shaped dressings combined with polyurethane mattresses. There was no significant difference between using a horseshoe shaped hydrocolloid dressing and using the standard shape for reducing the number of pressure sores. By contrast, we noted a highly significant difference with patients treated with the *Elasto-Gel™* horseshoe shape. The cost savings when using the *Elasto-Gel™* horseshoe shaped dressing and eliminating the use of specialty beds is highly significant.

Introduction

Many patients do not need pressure prevention care because they are mobile and can therefore take care of their pressure areas themselves. Consideration of the causes of pressure sores leads to the simple conclusion that the very best way to protect patients is to prevent pressure and shearing forces upon the skin,^{1,6}. To reduce shearing forces, a great number of nursing institutions apply a film or a hydrocolloid wound dressing to the skin. In daily practice you can be confronted with two problems concerning the prevention of shearing forces on the sacrum: firstly, the anatomy of the buttocks does not make things easier to firmly hold a film or hydrocolloid dressing in place, and secondly, when using hydrocolloid dressings possibly combined with alginates, the condition of the intact skin can deteriorate. In the Red Cross Hospital in Beverwijk, we too experience that problem.

Aim of The Study

The aim of the two year study was to investigate the effect on pressure and shearing forces of an *Elasto-Gel™* horseshoe shaped dressing applied to the buttocks and ischial tuberosities of patients in surgery. The idea for this investigation, involving nurse intervention on surgical and medical patients, came from the practicing nursing staff on surgical ward n° 5 of the Red Cross Hospital.

The Innovation

It is well established that pressure sores often develop after a patient has been on the operating table for an extended period of time. The treatment of pressure sores is a very costly one and in some cases, pressure sores can cause the death of a patient. In an attempt to prevent pressure sores, a number of products were evaluated over a two year period. It started three years ago at the surgical department of Red Cross Hospital in Beverwijk, the Netherlands. Nursing staff developed a new shape that is adapted to the anatomy. This new shape was called the horseshoe because the shape looks like a horseshoe and covers both the sacrum and the ischial tuberosities. The positive effect of glycerine on wounds had already been discovered. The nursing staff was using a gel pad called *Elasto-Gel™*. *Elasto-Gel™* was introduced in 1988 by Southwest Technologies, Inc. This occlusive dressing is a mixture of glycerine and water in a cross-linked polymer matrix. *Elasto-Gel™* has a high glycerine content that does not macerate the skin². The dressing is breathable, but can also be seen as an occlusive dressing because it protects the skin against the outside environment³. *Elasto-Gel™* is a thin gel sheet. The nurse cannot inspect the wound through the dressing, but in daily practice that is not a problem because the nurse can inspect the skin by removing the *Elasto-Gel™* dressing very easily after which it can be replaced. The nursing staff was enthusiastic about using *Elasto-Gel™* on the intact skin instead of using hydrocolloids and urethane films because:

1. *Elasto-Gel™* does not dehydrate the intact skin.
2. *Elasto-Gel™* contours around the body because it is flexible and stretchable.
3. *Elasto-Gel™* has pressure distributing properties and shearing forces are to a large extent eliminated, this reduces the risk for pressure sores.
4. *Elasto-Gel™* can be replaced on the wound if it is not saturated.
5. The skin under the dressing remains in good condition because of the glycerine in the dressing.
6. *Elasto-Gel™* has a mild adhesion.
7. *Elasto-Gel™* has a high humidity and oxygen transfer rate and can absorb 3 to 4 times its own weight without macerating the skin.
8. Consists of natural ingredients which mimic the epidermis.

Methodology

Over a two year period (1995-1996) 9419 medical patients and 9562 surgical patients in the Red Cross Hospital in Beverwijk, the Netherlands were reviewed for this study. The Red Cross Hospital is a 375 bed general hospital with a specific function in burn wounds. A rigorous search was undertaken for quantitative review of the admission statistics and purchase statistics in the hospital. All patients who used a special care bed or mattress were identified by the survey of the company which delivers the special beds to the medical and surgical wards. The same survey was used to determine the number of special beds and mattresses delivered to the medical and surgical wards. All details, e.g. kind of bed or mattress, length of stay on the medical special bed or mattress, date of stay, patients name, ward of admission were recorded. Nursing reports were used for detailed information about patient characteristics. Excluding criteria: patients who came to the hospital already with any signs of pressure sores (stage 1-4) were excluded from the study.

Number of Patients

In 1995, a total number of 4696 medical patients came for admission to ward 1 and 4 of the Red Cross Hospital. In the same year, 4692 surgical patients came for admission to ward 2 and 5 of the Red Cross Hospital. In 1996, exactly 4723 medical patients and 4870 surgical patients came for admission to the Red Cross Hospital. In 1996, admission for medical patients increased with 0.57% and the number of surgical patients increased with 3.66%.

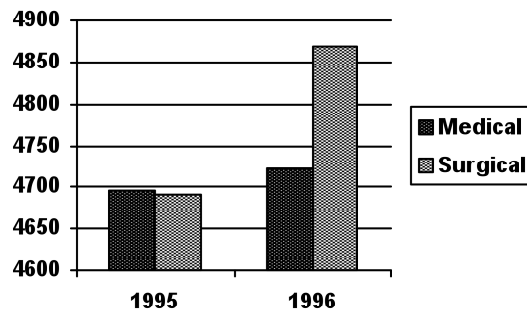


Table 1: Number of patients who went for admission to the surgical and medical wards of the Red Cross Hospital.

Statistical Procedure

The Statistical Package for the Social Science (SPSS) was used to analyze the results. We chose SPSS because it represents a highly flexible program. It provides excellent capabilities for labeling variables and includes all of the most commonly used parametric and non-parametric statistical procedures^{4,5,8}.

Dressings

In 1995 nursing staff at the medical wards 1 and 4 were using 143 hydrocolloid dressings to protect 107 patients from pressure sores. In the same year, nursing staff at the surgical wards 2 and 5 were using 430 hydrocolloid dressings to protect 145 patients from pressure sores. Compared with the medical wards, nursing staff at the surgical wards were using 66.7% more hydrocolloid dressings. In 1996, the nursing staff of wards 2 and 5 were using the *Elasto-Gel™* horseshoe shape instead of using hydrocolloids to protect patients who were undergoing major surgery.

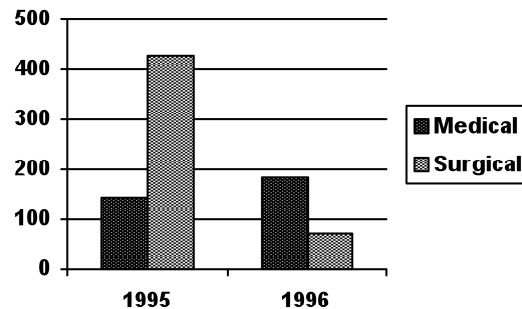


Table 2: Number of dressings used to protect patients from pressure sores.

The patients who were reviewed in this study were treated on the operating table for more than one hour. 105 patients were using preventative the *Elasto-Gel™* horseshoe shape in combination with a polyurethane mattress because the use of a special mattress alone will not prevent pressure sores^{1,9,10}. In total, 72 *Elasto-Gel™* dressings were used because two horseshoe shapes can be cut out of one *Elasto-Gel™* dressing. Nursing staff of wards 1 and 4 were using 184 hydrocolloids to protect medical patients from pressure sores. In total, 139 medical patients were treated with hydrocolloids to protect them from pressure sores.

Results

The results can be divided into two areas. On the one hand, the effect on the number of pressure sores and on the other hand, the effects on the cost of special beds, dressings and total cost of the treatment.

Number of Pressure Sores

In 1995 and 1996, nursing staff on the medical wards 1 and 4 were using hydrocolloid dressings to protect patients from pressure sores. In 1995, 117 out of 4696 medical patients developed pressure sores. In 1996, 172 out of 4723 medical patients developed pressure sores. As shown in table 3, the number of pressure sores for medical patients increased with 68% in one year.

In 1995, 139 surgical patients developed pressure sores. Only 12 patients were using preventative the *Elasto-Gel™* horseshoe shaped dressing. None of them developed pressure

sores. In 1996, 105 surgical patients were using the *Elasto-Gel™* horseshoe shaped dressing in combination with a polyurethane mattress. Only 8 patients developed pressure sores.

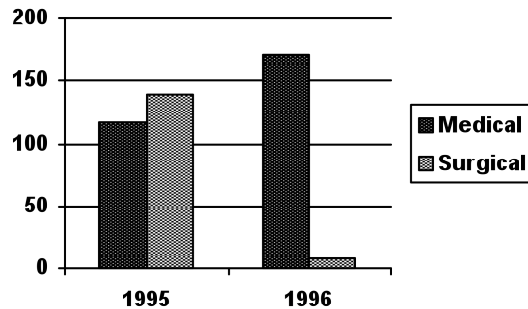


Table 3: Number of medical and surgical patients who developed pressure sores.

Cost of the Treatment

The total cost of special beds in 1995 was \$26,276.24 and in 1996 \$31,367.15 for medical patients. The cost of dressings, used by medical patients, in 1995 was \$793.86 and in 1996 \$1,076.16. When we look at the total material cost of the treatment on the medical wards, we see a total cost of \$27,070.10 in 1995 and \$32,443.31 in 1996. The cost of the treatment on the medical wards, as shown in Table 4, increased with 20% in one year.

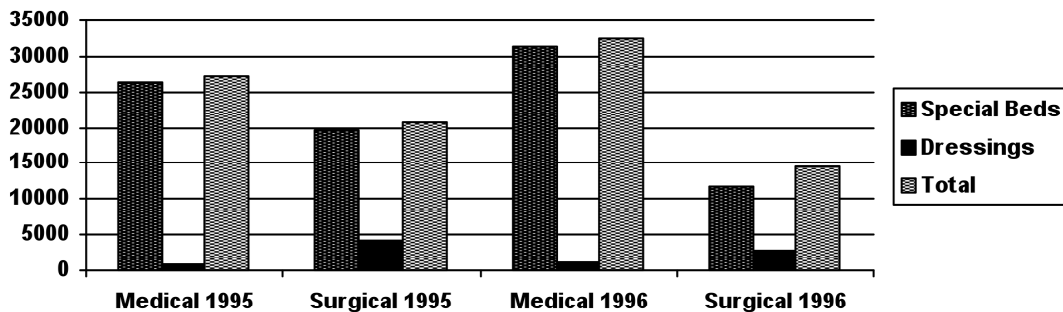


Table 4: Cost of special beds and dressings in US Dollars.

The cost of special beds used by surgical patients in 1995 was \$19,682.32 compared to \$11,798.34 in 1996. The cost of dressings decreased from \$4,063.80 in 1995 to \$2,774.19 in 1996. The total cost of treatment for surgical patients decreased from \$20,746.20 to \$14,572.53 in just one year (=30% decrease)!

Discussion

It is well known that some patients come into hospitals with pressure sores, particularly the elderly, but many sores develop while in the hospital and tend to do so in the first two weeks of hospitalization. We have to admit that patients do develop pressure sores on wards. According to Walsh and Ford (1993) it is a myth to say otherwise. To reduce shearing forces, a great number of nursing institutions are using a sheepskin or apply a film or hydrocolloid dressing to the skin. These methods combined with pressure reducing measures can contribute to pressure sore prevention. The advantages and disadvantages of any tool must be weighed against each other and in most instances, compromises must be made.

Comments

This retrospective study represents the kind of clinical nursing research needed to establish a scientific body of knowledge upon which definitive guides for the improvement of practice can be based. Using the *Elasto-Gel™* horseshoe shaped dressing to protect medical and surgical patients from pressure sores at the sacrum and the ischial tuberosities can be seen as a new nursing intervention that is highly successful. But there is one major problem: nurses are generally resistant to change. Change requires effort, retraining and restructuring one's work habits and may also be perceived as threatening. In addition, there was a saving in nursing time and patient quality of life was greatly improved.

The conclusion is that using the *Elasto-Gel™* horseshoe shaped dressing in conjunction with a polyurethane mattress highly reduces the risks of pressure sores, a significant difference compared with patients who were treated with hydrocolloid dressing. Using the *Elasto-Gel™* horseshoe shaped dressing is very cost effective because it can save on a yearly basis more than 70% on the total cost of treatment.

Literature

1. Walsh, M., Ford, P., *Nursing Rituals, Research and Rational Actions*, Butterworth-Heinemann, Ltd., London, 1993
2. Demoor, A., Deffendahl, C., Withaker, K., Motta, G., *Clinical Evaluation of an Absorbent Hydrogel Dressing, Solo and Combination Wound Management Approaches*, Presented at: Clinical Symposium On Pressure Ulcer and Wound Management Conference, 1994, Nashville
3. Stout, J.S., Protocol for *Elasto-Gel™* Occlusive Wound Dressings, Southwest Technologies, date of publishing unknown.
4. Polit, D.F., Hungler, B.P., *Nursing Research, Principles and Methods*, J.B. Lippincott Company, Pennsylvania, 1995
5. Huizingh, E., *SPSS voor Windows*, Academic Service, Amsterdam, 1995
6. Convatec, *Oorzaak en behandeling van decubitus*, Squibb B.V., Rijswijk, 1984
7. Lindeman, C.A., van Aernam, B., Nursing Intervention With the Pre-surgical Patient – The Effects of Structured and Unstructured Preoperative Teaching, *Nursing Research*, vol. 20, no. 4, p. 319-332, 1971
8. Swanborn, P.G., *Basisboek Sociaal Onderzoek*, Boom, Meppel, 1991
9. Zwarts, S., *WCS Wondenboek*, WCS, Leiden, 1992
10. Keuzekamp, T., Conservative Behandeling van Decubitus, *Nederlands Tijdschrift voor Geneeskunde*, nr. 31, p. 128, 1984