Exudate Management Properties of a Chitosan Based Nonwoven Gelling Fiber Wound Dressing*

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KEY POINTS
Absorbency of a new dressing based on a Marine Polysaccharide, Chitosan, was compared to that of other fiber dressings, through in vitro experiments.
1. Comparison to Alginates: The new dressing was found to outperform fiber dressings made of alginates in absorbency.
2. Comparison to Carboxymethylcellulose Dressings, reinforced and non reinforced: The new polysaccharide dressing was more absorbent than the non reinforced variety but similar compared to the reinforced variety in absorbency.

INTRODUCTION
The use of fibrous dressings in the management of wound dressings offers various benefits. Fiber dressings tend to be soft, conformable, and their numerous interstices and generally porous nature coupled with the hydrophilic nature of the materials selected lead to efficient exudates absorption, and the provision of a moist, soft gel like surface to the wound area.

A new non woven fabric constructed out of marine sourced polysaccharide polymers has been recently introduced. This material is an efficient absorber of fluids, forming in the process of absorption a soft, translucent or transparent gel that holds its structure even when wet.

The study described herein discusses the fluid handling properties of this material when compared to other hydrophilic dressings.

METHODS
Absorbency: A known area of the dressing was weighed (dry), followed by immersion of the dressing in saline solution for 30 minutes. The final weight was recorded (wet) and the absorbency value calculated. Six dressings were tested, Dressings O, A1, A2, S1, S2, and D.

Observational Conformance to irregular tissue surfaces: Saturated dressings were allowed to contact surfaces of tissue, with flesh from beef cattle being used to mimic a full thickness wound surface. Photographs were taken of the cross-sectional area of contact between the wet dressings and the tissue or flesh surface. The objective was to determine whether there was visually observable close approximation and contact between the wet dressing surfaces and the moist tissue which by its very nature has an irregular, non flat, contoured surface.

RESULTS
The results of the absorption value without compression are shown in Figure 1. Figure 2 is the photograph of a stitching reinforced dressing (A2) made of carboxymethylcellulose contacting a fleshy surface.

DISCUSSION
Maintaining quality patient care continues to be a financial challenge for Discussion: It was found that the new marine polysaccharide dressing (O) is able to absorb the saline, which mimics wound fluid, when the absorption happens in an environment free of compression. Differences between this new dressing and more traditional dressings such as those based on pure alginates (S1, S2) and the non reinforced product made from carboxymethylcellulose (A1), and another cellulose derivative (D) were statistically significant in favor of the new dressing. The absorbency of the new dressing and the reinforced dressing (A2) were statistically similar. As observed in the photographs shown in Figure 2 and Figure 3, the ability of the reinforced carboxymethylcellulose dressing (A2) to intimately contact a moist fleshy surface may be compromised by the feature of stitching, which could restrain the expansion and gel formation of the dressing post exposure to saline. In contrast, the strength of the marine polysaccharide based dressing is based on the uniform composition of the fibers rather stitching. Based on these observations, additional studies should be performed to determine whether the marine polysaccharide dressing is more likely to provide an intimate contact in wounds.

REFERENCES