

Tolerability of wound dressings with silicone or polyacrylate glues (border or wound pad) demonstrated by a clinical-experimental skin stripping test

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Introduction

The aim of the study (randomized, single-blind, intra-individual comparison) was to investigate the tolerability of six foam wound dressings with adherent border and adherent wound pad (with polyacrylate^B or silicone glues^A) on healthy skin (impairment of the skin's barrier function).

Material and Methods

On 15 volunteers the foam dressings were applied 5 times. The assessment for the barrier damage was demonstrated by Transepidermal Water Loss (TEWL), the removal of stratum corneum measured by chromametry after staining (by applying 250 µl of an aqueous 10% Dihydroxyacetone (DHA) solution on a filter disc [extra large Finn-Chamber, an occlusive patch system]), pain before and after removal as well as a clinical evaluation of the tolerability (erythema, dryness, fissures, papules, pustules, edema, vesicles, weeping, other). A positive approval of an independent ethic committee was available (feci code: 012/1966).

Results

The results are summarized in table 1 exemplary (after 5 repeated applications vs untreated or stained).

TEWL was statistically increased for the polyacrylate group^B in contrast to the silicone group^A (border and wound pad). The removal of the stratum corneum was higher in the acrylate group^B. Furthermore the silicone group^A demonstrated a very good pain tolerance and general tolerability (eg erythema).

Discussion

Silicone wound dressings^A showed a less tendency to damage the skin than wound dressings with polyacrylate glues^B. Therefore the adequate indication of each product group is important. Silicon dressings^A are more suitable for sensitive patients (eg with parchment skin, pain sensitive), polyacrylate wound dressings^B for special localizations with the need of high adherent properties like sacral pressure sores.

^A silicone group

1) Mepilex Border/Mölnlycke; 2) Biatain Silikon/Coloplast; 5) Allevyn Life/S&N; 6) Suprasorb P silicone/Lohmann&Rauscher

^B polyacrylate group:

3) Biatain foam dressing/Coloplast; 4) Allevyn foam dressing/S&N

Reference

Waring M, Bielfeldt S, Mätzold K, Wilhelm KP, Butcher M. An evaluation of the skin stripping of wound dressing adhesives. J Wound Care. 2011 Sep;20(9):412, 414, 416-22

Parameter (n= 15)	Untreated	Stained	Wound Area (Pad)						Adherent Area					
			1	2	3	4	5	6	1	2	3	4	5	6
Mean b*	15.87	20.56	20.10	19.53	20.45	17.94*	20.51	19.91	20.33	20.51	16.23*	17.73*	20.52	20.39
Mean TEWL	3.42	3.76	4.22	4.27	4.36	8.99*	4.23	4.39	4.67	4.27	36.91*	13.49*	4.81*	4.76
Mean Pain ⁽¹⁾	n.a.	n.a.	---	---	---	---	---	---	4.5	2.9	22.1	18.3	5.8	11.8
Mean Erythema ⁽²⁾	0.0	0.0	0.0	0.0	0.1	0.7	0.0	0.3	0.1	0.0	2.2	0.7	0.0	0.3

Product Codes: 1) Mepilex Border; 2) Biatain Silikon; 3) Biatain Foam; 4) Allevyn Foam; 5) Allevyn Life; 6) Suprasorb P silicone; n.a. : not applicable

* Statistical significant differences compared to stained area were observed ($p \leq 0.05$ or lower)

⁽¹⁾ Differences of subjective pain before and after test product removal. Assessments were performed for wound area (pad) and adherent area combined.

Visual analog scale 0-100 mm

⁽²⁾ Scale: 0 - none; 0.5 - very slight; 1 - slight; 2 - moderate; 3 - strong

Table1:

Skin Stripping Study: Results of tolerability parameters after 5 repeated test product removals

Human Subject 2 (for example):

Skin Stripping results before and after application (5 times)

