The effect of a topical cream application on water distribution in healthy skin and burn scars: pilot project

Authors: P. Moortgat ❶, M. Anthonissen ❶❷, J. Meirte ❶❸, U. Van Daele ❶❸, T. Vanhullebusch ❶❸, C. Lafaire ❶❹, L. De Cuyper ❶❹, K. Maertens ❶❺

❶ **OSCARE**, Organisation for burns, scar after-care and research, Antwerp, Belgium
❷ **KU Leuven**, Department of Rehabilitation Sciences, Belgium
❸ **University of Antwerp**, Rehabilitation Sciences and Physiotherapy, Belgium
❹ **ZNA Stuivenberg**, Burns Center, Antwerp, Belgium
❺ **Vrije Universiteit Brussel**, Department of Clinical and Lifespan Psychology, Belgium

Objectives:

Moisturizing is an essential part of scar management. However, the evidence for topical applications is poor or lacking in skin and scar research.
The study aimed to investigate baseline values of water distribution in healthy and scarred skin and to examine the effect of Alhydran® *(fig. 1)* on water distribution in healthy and scarred skin over time.

Fig. 1: *Alhydran® BAP Medical B.V.*

Fig. 2: *Corneometer® probe MPA 580 Courage Khazaka*

Methods:

For this pilot project, 20 healthy skin sites and 20 burn scar sites were included. At baseline, all sites were assessed for water content, using the Corneometer® *(fig. 2)* [1] and for water distribution, using the Moisture Map® *(fig. 3)* [1]. Water distribution is represented using gray index (derived from original image), corner density, number of intersection lines and number of cells (calculated from segmented image) *(fig. 4)*.

Fig. 3: *Moisture Map® Courage Khazaka*

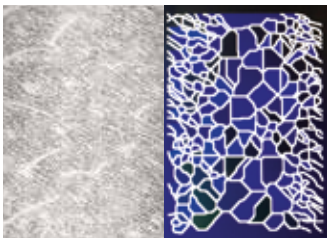

Fig. 4: *Original image (left) is transferred into a segmented image (right)*

Half of the healthy skin sites and scar sites formed the intervention group and were hydrated with Alhydran®, while the other half served as controls. Thirty minutes after application, these sites were re-assessed similarly.
For the statistical analysis, an independent samples T-test was carried out for the between-group analysis of baseline values. A paired sample T-test was used for the within-group analyses over time.

References:

1) www.courage-khazaka.de
2) www.alhydran.com/professionals-doctors-nurses-paramedics/

Results:

The baseline water content values and water distribution parameters for the healthy skin sites and scar sites are presented in table 1. Statistically significant differences between healthy skin and scar sites are found for water content and water distribution (except for gray index) at baseline (p≤.001) *(table 1)*.

Table 1: *Between-group analysis (p-value) at baseline for water content values and water distribution parameters of healthy skin sites and scar sites (mean ± standard deviation).*

	Healthy skin site	Scar site	p-value
Water content (AU)	37.3 ± 5.6	28.3 ± 9.9	.001*
Gray index	21.7 ± 5.9	18.5 ± 8.9	.195*
Corner density (%)	3.2 ± 0.7	1.5 ± 0.8	.000*
Intersection lines	679.2 ± 122.8	359.3 ± 153.8	.000*
Cells	357.0 ± 75.6	183.9 ± 83.5	.000*

Thirty minutes after Alhydran® application (T30), all outcome measures of healthy skin improve significantly compared to baseline (T0) (p≤.018). For the scarred skin a trend towards improvement was noticed, however not significant (ns) *(table 2)*.

Table 2: *Within-group analysis over time for the healthy skin sites and scar sites (p-value) with mean difference (T30-T0) ± standard deviation (sd).*

	Healthy skin site		Scar site	
	mean T30-T0 ± sd	p-value	mean T30-T0 ± sd	p-value
Water content (AU)	4.1 ± 2.6	.001*	3.5 ± 9.3	ns
Gray index	4.4 ± 4.8	.018*	1.8 ± 5.4	ns
Corner density (%)	0.9 ± 0.7	.003*	0.2 ± 0.6	ns
Intersection lines	151.5 ± 132.2	.006*	45.3 ± 114.5	ns
Cells	102.6 ± 76.6	.002*	25.7 ± 67.2	ns

Conclusion:

The uptake of water after moisturizing differs significantly between healthy skin sites and scar sites. A single Alhydran® application shows a significant increase in water content and water distribution after 30 minutes in healthy skin.

In scarred skin, there is a trend in improvement. These results support previous findings that scarred skin is less permeable for a single application than healthy skin. For future research, we would suggest multiple Alhydran® applications (at least 3x / day, as described in usage guidelines of Alhydran®) on healthy skin sites and scar sites with a longer follow-up period [2].

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