

Effect of Ceramide III on Skin with Surfactant Induced Dermatitis An in-vivo barrier repair study

Introduction: The lipid barrier of the skin, localised in the Stratum Corneum, prevents transepidermal water loss. Ceramides are the most important class of lipids in the skin. After damaging healthy skin with surfactant to induce skin irritation, it is treated with Ceramide III containing products. The role of Ceramide III in barrier repair is studied.

Study: This study was performed for Cosmoferm by Dermaconsult (Germany).

Methods: The forearms of 15 female volunteers (age: 20-41 years) were exposed to a 5% aqueous solution of Sodium Dodecyl Sulphate (SDS). For two hours an occlusive dressing was applied to induce skin irritation. After removal of the dressing, the areas were washed (water) and air-dried. After 30 minutes, the degree of skin damage was measured (=after SDS).

Two Ceramide III formulations (0.2% and 0.5%) and a control product were applied. The dose of application was about 2 mg/cm² (twice/day for 14 consecutive days). One area remained untreated. Measurements were evaluated before application, after SDS and at day 3, 7 and 14.

The measurements consisted of

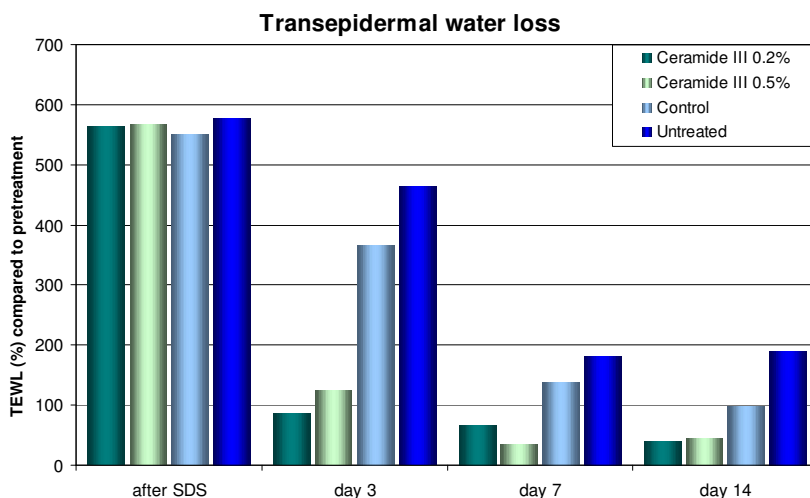
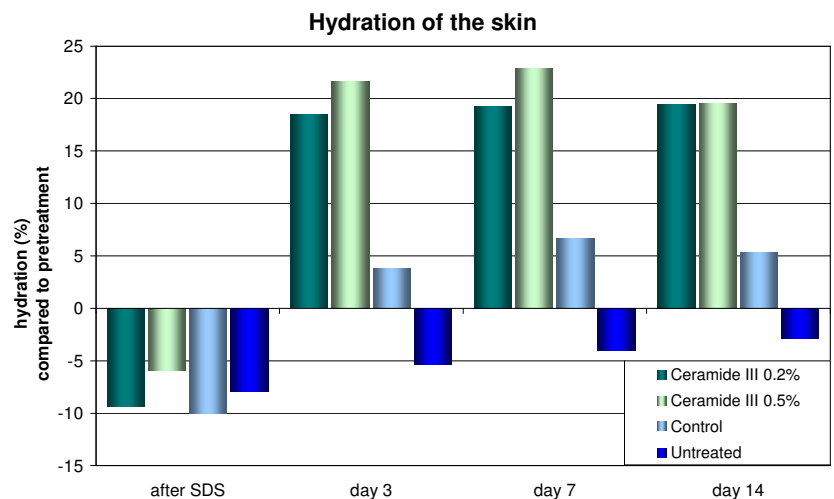
- water retention capacity : corneometer for defining hydration state of the Stratum Corneum
- transepidermal water loss TEWL: TEWA-meter for determination of water evaporation

The values for hydration (%) and TEWL (%) were expressed as percentual differences relative to the pretreatment value. The Wilcoxon signed ranks test with paired samples was used to determine statistical differences between Ceramides and control formulation.

Results: The graph (→) shows the hydration (%) compared to pretreatment. SDS treatment decreased the hydration state of the skin. Untreated skin had not recovered at day 14.

Already after 3 days of application, Ceramide III showed a significantly greater increase in the skin water content after SDS treatment than the Control.

Using Ceramide III the increase in water retention was about 15% higher than using Control.



The graph (←) shows the TEWL (%) compared to pretreatment and the restoration of TEWL after SDS treatment. Untreated skin had not recovered after 14 days.

Ceramide III - containing formulations normalised TEWL in a significantly shorter time period (3 days) than Control formulations.

Conclusion: Under the conditions of this study, application of Ceramide III helped the skin recover from irritant-induced damage. Already after 3 days, the recovery effect of Ceramide III was significantly stronger than the Control. These results support the role of Ceramide III in regulating skin barrier function.