

Effect of topical application of intercellular lipids on sodium lauryl sulphate-damaged skin barrier function in dog

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Ceramide, cholesterol and free fatty acids are the major intercellular lipids, maintaining the integrity of the skin barrier. However, the role of these lipids in canine skin barrier function is little known. The aim of this study was to evaluate the repair effect of ceramide, cholesterol, linoleic acid and lipids mixture on damaged canine skin barrier by sodium lauryl sulphate (SLS). Five beagle dogs were involved. Transepidermal water loss (TEWL), skin hydration, skin pH and skin thickness were assessed every day during experimental periods. Histological profiles were assessed on 12 days. Statistical analysis was performed using ANOVA (SPSS, ver. 12.0). SLS (1.25%) effectively induced the canine skin barrier damage. TEWL was significantly decreased by topical application of ceramide and lipids mixture in SLS and vehicle-treated skin on 8 and 12 days, respectively ($p < 0.05$, $p < 0.01$). By end of the experiment all lipids significantly decreased the TEWL as compared with SLS and vehicle control, but ceramide and intercellular lipids mixture more significantly decreased the TEWL than linoleic acid and cholesterol, respectively ($p < 0.01$). Skin hydration was significantly increased by ceramide and lipids mixture during experimental periods ($p < 0.01$). In histological profiles, the thickness of stratum corneum were significantly increased by stratum corneum lipids as compared with vehicle ($p < 0.01$). And 2% ceramide and intercellular lipids mixture showed more prominent improvement of barrier recovery. Skin pH was significantly decreased by linoleic acid and intercellular lipids mixture. These results indicated that topical application of ceramide and lipids mixture improved dramatically damaged-skin barrier function by SLS. Also, it was considered that the use of ceramide or intercellular lipid mixture is recommended for the management of skin barrier dysfunction by irritant and inflammatory skin disorders such as atopic dermatitis.

Key words: sodium lauryl sulphate, ceramide, lipids, skin barrier, dog

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