ABSTRACT

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Ceramides are essential lipid components in the stratum corneum of human skin, playing a critical role in maintaining the skin's barrier function. Alterations in the absolute levels and the ratio of various ceramide subclasses have been linked to the disruption of this barrier, contributing to the pathogenesis of psoriasis. This study primarily aimed to investigate the therapeutic potential of exogenous Acylceramide EOS, delivered via a topical cream, in mouse models with induced psoriasis. Furthermore, the research sought to compare the ceramide profiles in the stratum corneum between healthy mice and those with induced psoriasis.

Specific objectives included quantifying selected ceramide subclasses and analyzing them based on acyl chain length, sphingoid base content, degree of hydroxylation, and the ratio of changes between long-chain and ultra-long-chain ceramides. The study involved 12 mice, divided into four groups of three, each receiving different treatments: the first group served as the control with no treatment, the second group received only Imiquimod to induce psoriasis, the third group received Imiquimod along with a blank cream, and the fourth group was treated with Imiquimod and ceramide EOS29 cream.

Strip tapes were collected from a consistent location on the dorsal side of each mouse for protein content determination. Ceramides were then extracted using a mixture of organic solvents and analyzed through LC-MS/MS with the inclusion of internal standards. This analysis focused on quantifying specific ceramide subclasses and evaluating them concerning the average acyl chain length, individual sphingoid base content, and degree of hydroxylation.

Our results indicate a potential involvement of phytosphingosine ceramides in the skin barrier dysfunction of the mouse stratum corneum with induced psoriasis. Although the application of 0.5% ceramide EOS cream did not result in an improvement in transepidermal water loss, it did alter the ceramide profile compared to other treatment groups and improved the ratio of long-chain to ultra-long-chain ceramides.