Alterations of glucosylceramide-beta-glucosidase levels in the skin of patients with psoriasis vulgaris.

Abstract:
Hydrolysis of glucosylceramides by the enzyme glucosylceramide-beta-glucosidase (GlcCer'ase) results in ceramide, a critical component of the intercellular lamellae that mediates the epidermal permeability barrier. A disturbance of ceramide formation is supposed to influence the transepidermal water loss in common skin diseases like atopic eczema or psoriasis. The aim of this study was to investigate whether GlcCer'ase levels were altered in the skin of subjects with psoriasis vulgaris. Skin punch biopsies were taken from lesional and non-lesional psoriatic skin and GlcCer'ase was evaluated both at the RNA and at the protein level. Normal skin from surgical patients provided the baseline GlcCer'ase expression in healthy subjects. Our results show that GlcCer'ase mRNA expression was decreased in psoriatic non-lesional skin compared to normal controls in all cases. Interestingly, in lesional psoriatic skin the level of GlcCer'ase was increased compared to non-lesional skin in all cases. For the immunohistochemical analysis, we used a newly synthesized monoclonal antibody anti-human GBC (GlcCer'ase-GST fusion protein). The results confirmed that GlcCer'ase, mainly present in the upper epidermis, was decreased in psoriatic skin compared to normal control and was increased in lesional compared to non-lesional psoriatic skin. Our findings support the concept that alteration in water permeability barrier
in lesional psoriatic skin can serve as a trigger for the upregulation of the expression of enzymes like GlcCer’ase with consequent stimulation of ceramide generation.