〈原　著〉

ヒト皮膚の角層バリア破壊による角層機能と刺激閾値への影響

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Barrier Disruption of Stratum Corneum Induced Susceptibility to Irritants

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Abstract

The skin of patients with atopic dermatitis (AD) are known to be sensitive to environmental stimulation due to the impaired barrier function of the stratum corneum (SC). We studied in a noninvasive fashion the sensory function of the skin for electric current using Neurometer® (CPT/C) together with measurements of transepidermal water loss (TEWL) for evaluation of the barrier function of the SC and high frequency conductance for assessment of skin surface hydration state. Electrical current perception threshold (CPT), evaluation quantifies the sensory threshold to transcutaneous electrical stimulation irrespective of the skin thickness or temperature. The AD patients showed a lower barrier function and lower CPT than normal individuals indicating that they have more sensitive skin on the cheek and volar surface of the forearm than healthy controls. Furthermore, we evaluated the CPT and the sensitivity to a chemical reagent such as an aqueous solution of lactic acid after mild disruption of the SC of the forearm of healthy individuals by the following three methods, *i.e.*, 1. removal of superficial sebum with acetone/ether, 2. scratching with a needle, and 3. tape-stripping. CPT was inversely correlated to TEWL levels after tape stripping. Even the superficial scratching that did not increase the TEWL decreased CPT and increased the lactic acid stinging response. We think that scratching of the stratum corneum induces perturbation of the barrier function with a decreased threshold for electrical and chemical stimulations. Also we examined the effect of topical application of emollients to the SC barrier disrupted skin. Topical application of emollients prevented hypersensitivity caused by scratching. From these results we conclude that SC disruption caused by scratching may cause further damage to the barrier functions of the SC in AD patients to facilitate the permeation of various environmental allergens and also induce hypersensitive skin.

Key words: sensory nerve current perception threshold, pruritus, atopic dermatitis.