

〈一般論文〉

Na⁺/H⁺ Exchanger 1 は皮膚 pH と肌荒れに関与する

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Na⁺/H⁺ Exchanger 1 Is Responsible for Skin pH and Rough Skin

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Abstract

Natural skin surface pH is mildly acidic, but the relationship between skin surface pH and rough skin is not sufficiently elucidated. Recently, it has become clear that Na⁺/H⁺ exchanger 1 (NHE1) plays an important role in the acidification of skin surface. NHE1 exists on the cell membrane of keratinocytes and regulates intracellular pH by effectively extruding H⁺ ions from intracellular compartments in exchange for external sodium ions, which also controls the acidification of extracellular microdomains and, consequently, contributes to the skin surface pH. In this study, we investigated the relationship between NHE1 protein amount, skin surface pH, and the onset of rough skin on cheek skin of male subjects. The skin surface pH value was measured and the stratum corneum was tape-stripped twice at monthly intervals. NHE1 protein amount was measured by Western blotting, and the multilayer exfoliation state was observed with microscope and quantified. As a result, a negative correlation was found between the changes in NHE1 protein amount and skin surface pH value. Also, there were a positive relationship between the changes in skin surface pH value and multilayer exfoliation score and a negative relationship between the changes in NHE1 protein amount and multilayer exfoliation score. That is, the relation between NHE1 protein amount, skin surface pH, and the onset of rough skin was confirmed. On the basis of these results, NHE1 may be involved in skin surface pH control and the onset of rough skin, and the functional decline of NHE1 is considered to induce an increase in skin surface pH value and an onset of rough skin.

Key words: Na⁺/H⁺ exchanger 1 (NHE1), skin surface pH, rough skin, mildly acidic, relationship.