Effect of topical application of staphylococcus aureus in the DNCB and dust mite extract-induced murine model with atopic dermatitis-like lesions

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Atopic dermatitis (AD) is a chronic inflammatory skin disease showing immunologic abnormalities. Skin colonization of Staphylococcus aureus (SA) is a common exacerbating factor in AD, but their immunopathological mechanisms are not fully understood yet. To clarify the effect of the topical application of SA on 2, 4-dinitrochlorobenzene (DNCB) and house dust mite extract (Dermatophagoides farinae extract, DFE)-induced AD-like skin lesions in BALB/c mice, we firstly established AD-like model in BALB/c mice through repeated alternative local exposure of DNCB/DFE to the ears. Then the ears were colonized with a SA suspension that was calibrated to 108 and 109 cfu/mL. We assessed clinical features and observed histopathological findings with H&E and toluidine blue stain. The serum IgE, IgG2a levels and histamine contents were measured. Analysis of cytokines of T cell subsets in the ears using real-time PCR was also conducted. As a result, SA aggravated AD-like skin lesions in the murine model based on clinical findings including ear thickness. SA applied mice showed an altered expression of T cell cytokines suggesting immunopathological changes in the skin.

Key Words: Atopic dermatitis, Cytokines, IgE, Murine model, Staphylococcus aureus