

Water-soluble low-molecular-weight β -(1, 3–1, 6) D-Glucan inhibit cedar pollinosis

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ABSTRACT:

Background: The incidences of allergenic diseases such as allergic rhinitis, atopic dermatitis, asthma, and food allergies have increased in several countries. Mast cells have critical roles in various biological processes related to allergenic diseases. Mast cells express the high-affinity receptor for immunoglobulin (Ig) E on their surface. The interaction of multivalent antigens with surface-bound IgE causes the secretion of granule-stored mediators, as well as the *de novo* synthesis of cytokines. Those mediators and cytokines proceed the allergenic diseases. We investigated the effects of water-soluble, low-molecular-weight β -(1, 3–1, 6) D-glucan isolated from *Aureobasidium pullulans* 1A1 strain black yeast (LMW- β -glucan) on mast cell-mediated anaphylactic reactions. We reported that LMW- β -glucan dose-dependently inhibited the degranulation of mast cells. Furthermore, we found that orally administered LMW- β -glucan inhibited the IgE-mediated passive cutaneous anaphylaxis (PCA) reaction in mice. Here, we examined if LMW- β -glucan had any effects on Japanese cedar pollinosis.

Findings: In a clinical study, a randomized, single-blind, placebo-controlled, parallel group study in 65 subjects (aged 22–62) was performed. This study was undertaken 3 weeks before the cedar pollen season and until the end of the cedar pollen season. During the study, all subjects consumed one bottle of placebo or LMW- β -glucan daily, and all subjects were required to record allergenic symptoms in a diary. The LMW- β -glucan group had a significantly lower prevalence of sneezing, nose-blowing, tears, and hindrance to the activities of daily living than the placebo group.

Conclusions: These results suggest that LMW- β -glucan could be an effective treatment for allergenic diseases.

Key Words: Mast cell, anti-allergy, β -glucan, cedar pollinosis