Immune response to multi-epitope *Blomia tropicalis* hybrid protein in mice

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**Background:** The mite *Blomia tropicalis* (Blo t) is an important source of allergens and a major risk factor for allergic rhinitis and asthma. A hybrid protein that includes epitopes of allergens Blo t 1, Blo t 5, Blo t 10, Blo t 12 and Blo t 13 (BTx5) and shows low IgE reactivity in sera from house dust mite allergic subjects was reported previously. This study evaluated the BTx5 immune response in BALB/c mice.

**Methods:** Mice were immunized intraperitoneally with BTx5 mixed with aluminum hydroxide and intranasal challenge with BTx5. Additionally, a group of mice was similarly treated with *Blomia tropicalis* and another group with PBS. Serum levels of specific IgE, IgG1, IgG2a and cytokines in bronchoalveolar lavage fluid (BALF) were determined by ELISA. Airway inflammatory response was evaluated by methacholine challenge and the cellular infiltrate in lung tissue. The blocking effect of the IgG raised in mice immunized with BTx5 on IgE binding to Blo t extract was analyzed by ELISA inhibition.

**Results:** Immunization with BTx5 induced specific IgG2a to *Blomia tropicalis* extract; the antibody levels were significantly higher than IgE (IgE/IgG2 = 0.22). Mice treated with BTx5 versus *Blomia tropicalis* extract showed significantly lower levels of IL-5 (p = 0.05) and IL-13 in BALF (p = 0.01), airway hyper-reactivity (p = 0.01), cellular infiltration (p = 0.008) and mucus production in lung tissue (p = 0.045). The BTx5 induced IgG antibodies inhibited 63 % of the IgE reactivity to *Blomia tropicalis* extract in human sera from allergic patients sensitized to *Blomia tropicalis*.

**Conclusions:** BTx5 fosters a Th1 biased immune response and lower airway inflammation. The induction of IgG blocking antibodies suggests a potential anti-allergic effect.

**Keywords:** IgG blocking antibodies; *Blomia tropicalis*; Allergic rhinitis; Asthma