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DEVELOPMENT of an EXPERIMENTAL ALLERGIC CONJUNCTIVITIS MODEL in MICE

Purpose: To develop an animal model that simulates human allergic conjonctivitis to understand the physiopathogenesis of allergic diseases and for developing novel therapeutic interventions.

Methods: BALB/c mice (12 males) were divided into two groups each comprised of six mice. For sensitization, on the 1st and 8th days, a 0.2 ml mixed solution, adjusted to a concentration to 5mg/ml of ovalbumin (OVA) and 15mg/ml of aluminium hydroxide, was administered intraperitoneally to the mice in Group 1 and 0.2 ml saline solution to the mice in Group 2. To induce experimental allergic conjunctivitis, an antigen challenge was made on days 15 and 18, using an OVA solution (5mg/ml) instilled into both eyes of the mice in Group 1; while the mice in Group 2 received Human Balanced Salt Solution instead of OVA. For the clinical evaluation, the occurrence of conjunctival and palpebral oedema, conjunctival hyperaemia, and lacrimation were observed. For the histological examination, eyeballs, eyelids and lacrimal glands were removed and prepared according to the routine processing method of the tissue laboratory. Immunohistochemical examination was made with Mast cell tryptase using the labeled Streptavidin–Biotin amplification method and 3,3´-diaminobenzidine, in addition to Hematoxylin-Eosin (HE), and Toluidine Blue (TB) staining.

Results: Evident conjunctival oedema, palpebral oedema, conjunctival hyperaemia, and lacrimation were observed in Group 1. Mean mast cell density infiltrating the subconjunctival tissue was significantly higher in Group 1 (allergy group, 23.2 ± 7.5 cells/mm^2, $p<0.0001$) when compared to Group 2 (5.6 ± 3.1 cells/mm^2). There was no increase in eosinophil and lymphocyte counts as well as vascular intensity in the subconjunctival tissue in any group.

Conclusion: The murine model developed is similar to the human allergic conjunctivitis both clinically and histopathologically and as a template for future studies.

Key words: allergic conjunctivitis, mouse model, ovalbumin (OVA)

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