An In Vitro Model of Ocular Cicatricial Pemphigoid

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Ocular Cicatricial Pemphigoid (OCP) is a systemic autoimmune disease with a wide spectrum of clinical presentations. My colleagues and I, most particularly Dr. Razzaque Ahmed of the New England Baptist Hospital, and Dr. Tesavibul of Bangkok, Thailand developed an in vitro model designed to examine the mechanism by which conjunctival epithelial cells separate from the matrix and basement membrane in patients with OCP and produce the characteristic OCP lesion.

We used normal human conjunctiva in organ culture to determine the effects of study reagents on the integrity of the basement membrane zone (BMZ). Small pieces (2 x 3 mm^2) of normal human conjunctiva obtained during cataract surgery were floated in complete RPMI-1640 medium. Total serum, purified IgG fractions or immunoiffinity purified autoantibodies from OCP patient's sera, or anti β 4 integrin subunit monoclonal antibodies were added and incubated at 37^o C with 5% CO_2 for 24 to 72 hours. Normal human serum (NHS) and normal human IgG were used as control reagents. After incubation the tissue samples were examined by standard hematoxylin and eosin staining procedures.

After twenty-four hours, no separation or blister formation was observed. Between forty-eight and seventy-two hours, subepithelial separation was observed in the conjunctiva treated with OCP patients sera, or with IgG fractions from OCP patients sera, or with monoclonal anti-beta 4 integrin subunit monoclonal antibodies. No changes were observed in the tissues incubated with NHS or with normal human IgG.

We conclude that this in vitro organ culture system model provides a mechanism to study the specific and sequential events involved in the cellular and molecular processes of subepithelial separation in OCP. Additional studies are in progress to evaluate individually and collectively the importance of other serum proteins, interleukins, and inflammatory cells subsets.