

## ULTRASTRUCTURAL STUDY OF THE NADPH-DIAPHORASE ACTIVITY IN THE HUMAN NASAL RESPIRATORY MUCOSA IN VASOMOTOR RHINITIS

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**INTRODUCTION.** In normal subjects the nasal respiratory mucosa (NRM) is covered by a pseudostratified columnar epithelium. Ciliated cells (CC), goblet cells (GC) and basal cells (BC) are the cells occurring with greatest frequency. Recently nitric oxide synthase (NOS) has been detected in nasal respiratory epithelium (NRE) (1). In normal subjects, the epithelial NO increases the ciliary beat frequency and may act as vasodilator. In addition, it is involved in host defence by its cytotoxic effects. The role of the epithelial NO in the respiratory pathology is still unclear. Recent light microscopy studies have shown an increased NOS activity in the bronchial epithelium from subjects with asthma (2) and in the NRE from patients with chronic rhinitis (1). Vasomotor rhinitis (VMR) is a nonallergic, noninfectious chronic type of rhinitis with nasal congestion and rhinorrhea, but without nasal eosinophilia. In this research we investigated the ultrastructural distribution of NOS in the NRE from normal subjects and from patients affected by VMR. NADPH-diaphorase (NADPH-d) histochemistry was employed. It has been in fact shown that staining for NADPH-d activity overlaps in the NRE with the immunolocalization of NOS (1, 3).

**MATERIAL AND METHODS.** Samples of NRM were obtained from 4 normal subjects during corrective surgery of the nasal septum, and from 7 patients with VMR undergone to surgical reduction of the inferior turbinates. The specimens, fixed with aldehydes and processed for NADPH-d ultracytochemistry (4), were post-fixed in osmium tetroxide and embedded in Epon 812, following the usual procedures.

**RESULTS AND DISCUSSION.** In the normal NRE a weak enzymatic reaction was found in the sovranuclear region of the CC. The reaction was generally absent in the BC and in the GC. In patients with VMR the NRE appeared strongly altered. The loss of CC and GC was the most evident ultrastructural finding. The BC did not show junctional specializations and were separated by large irregular spaces. Several discontinuities were found in the basement membrane. A strong NADPH-d activity, distributed in the nuclear envelope, in the mitochondria and in the cisternae of SER, was recognized in the BC. The hypothesis is put forward that the epithelial alterations observed in the VMR could be, at least in part, the consequence of the strong NO production in the BC, causing cytotoxic effects on the CC and BC and blocking the regenerative epithelial processes.

**REFERENCES.** 1) Furukawa K. et al. *Am J Respir Crit Care Med* 153, 847-850, 1996; 2) Hamid Q. et al. *Lancet* 342, 1510-1513, 1993; 3) Lee S.H. et al. *Acta Oto-Laryngol* 115, 823-829, 1995; 4) Wolf G. et al. *Neurosci Lett* 147, 63-66, 1992.