Inhaled Corticosteroid Treatment and Extracellular Matrix in the Airways in Asthma

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Abstract
Even mild asthmatics with a short duration of the disease show at the morphological level a picture of chronic inflammation with airway epithelial changes and influx of inflammatory cells into the airway mucosa. Several studies have shown that inhaled corticosteroid treatment can ameliorate this inflammation. In addition, even a morphologically normal epithelial structure may be restored. However, factors which may lead to more chronic disease have remained obscure. Recent studies are now focusing on the reversibility of collagen deposition in the airway epithelial basement membrane. Airway epithelial and stromal interactions may be important when a change at this level occurs.

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Introduction
The discovery of the inflammatory nature of bronchial asthma even at an early stage of the disease has led to an increase in the clinical use of anti-inflammatory drugs in the treatment of asthma [1-6]. In addition to an increase in the number of inflammatory cells, structural epithelial changes have been described in asthma [2, 5,7]. The epithelium may have an important function in regulating the inflammatory process, and the interaction between the epithelium and the subepithelial basement membrane in the airways may play a crucial role in the pathogenesis of asthma.

Extracellular Matrix in the Basement Membrane

Structural Epithelial Changes
A prominent feature in asthma is the marked airway oedema with shedding of airway columnar epithelial cells [8]. This shedding may be caused by a weak cellular attachment of adjacent columnar epithelial cells to each other or to the basal cells. Cell adhesion molecules help epithelial cells to maintain contact with their underlying stroma and with each other [9]. The best characterized of the cell adhesion molecules is the basement membrane under the epithelium is a thin layer of specialized extracellular matrix not only providing mechanical support but also influencing cellular behaviour [11]. Interactions between the bronchial epithelium and the extracellular matrix proteins have been shown to play a significant role during the development of the structural organization of the lung [12]. During this process, the receptor site of the cells mediates signals from the matrix inside the cell which in turn may alter cell secretion. Several glyco-
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