

## **Different inflammatory mechanisms in lungs of severe and mild asthma: crosstalk of NF-kappa-B, TGF $\beta$ 1, Bax, Bcl-2, IL-4 and IgE**

### **ABSTRACT**

**Objective:** To examine differences in the apoptotic, inflammatory, allergic and immunological features in the lungs of adults with asthma. **Material and methods:** Thirty-six patients with mild asthma (MA), 16 with severe asthma (SA) and 20 healthy volunteers (HVs) were enrolled. Bronchoalveolar lavage fluid (BALF) was processed into cell-free fluid for enzyme-linked immunosorbent assay detecting soluble TGF $\beta$ 1, IL-4 and IgE and BALF lymphocytes for immunocytochemical staining of cellular Bax, Bcl-2 and nuclear factor-Kappa-B (NF $\kappa$ B). **Results:** Cellular NF $\kappa$ B expression was higher in SA than in MA and HVs, while extracellular TGF $\beta$ 1 was high in both the SA and MA groups but low in the HVs. Bcl-2/Bax ratio was higher in SA than in MA and in MA than in HV groups and correlated significantly with NF $\kappa$ B level. Interestingly, the levels of IgE and, to a lesser extent, IL-4 were higher in MA than in SA and both were much higher than in HVs, and were inversely correlated with NF $\kappa$ B level in the SA group and with TGF $\beta$ 1 level in the MA group. **Conclusions:** NF $\kappa$ B has a central role in the perpetuation of persistent inflammation in SA and might induce apoptosis via Bcl-2. The SA group appears not associated much with allergen-based IgE and IL-4 reactions as efficiently as in MA. This was supported by the lower levels of IgE and IL-4 in SA compared to MA. TGF $\beta$ 1 appears to be associated with asthma pathogenesis, especially allergen-based MA.

**Keyword:** Allergy; Apoptosis; Atopy; BALF; Cell survival; Cytokines; ELISA; Immunocytochemistry; Inflammation; Lymphocytes