enced the proliferation of several CD4+ TLC, either inducing inhibition or stimulation, dependent on the particular TLC studied. Remarkably, TLC from patients with asthma showed significantly less increase in intracellular cyclic AMP upon addition of histamine than those from healthy subjects. This confirms earlier studies on the effects of histamine on polyclonal cell populations from the blood.

We conclude that TLC (not selected for allergen specificity) from patients with asthma differ in several aspects from those from healthy persons. In particular, TLC from the airway compartment are more activated and differentiated than those from blood. This points to an active role for T lymphocytes in airway inflammation.

**Evaluation of Airway Inflammation by Endobronchial and Transbronchial Biopsy in Nocturnal and Nonnocturnal Asthma**

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Airway inflammation has been quantified in bronchoalveolar lavage fluid and endobronchial biopsy (EBBX), but a pathologic comparison between subjects with nocturnal asthma (NA) and nonnocturnal asthma (NNA) including evaluation of proximal (EBBX) and distal (transbronchial biopsy [TBBX]) inflammation has not been performed. In an ongoing study, we have evaluated three subjects with NA, defined as an overnight fall in peak expiratory flow rate (PEFR) of $\geq 15\%$ and six subjects with NNA, defined as an overnight fall in PEFR of $<15\%$. Subjects underwent two bronchosopies with EBBX and TBBX, one at 0400 h and the other at 1600 h in a random order separated by 1 week. The subjects tolerated the procedures well. Morphometry was performed on 2-µm sections to determine the numbers of eosinophils, macrophages, lymphocytes, and neutrophils per volume (mm³) of epithelium, interstitium, and alveolar septal tissue, respectively. Separate EBBX sections were also stained for activated eosinophils, activated mast cells, and T lymphocytes with the monoclonal antibodies EG2, AA1, and CD3, respectively.

Morphometric studies revealed increased numbers of eosinophils in the 0400 h TBBX, but not the EBBX, in the subjects with NA as compared to subjects with NNA (Fig 1) when analyzed by the Mann Whitney U test ($p=0.04$). In addition, preliminary findings of the monoclonal antibody staining of EBBX in five patients, two with NA and three with NNA, revealed an increased number of eosinophils staining for EG2, but only at 0400 h in subjects with NA as compared to those with NNA (formal analysis presently not carried out due to small sample size).

Thus, tissue inflammation (eosinophils) and eosinophil activation appear to be increased at 0400 h in subjects with NA as compared to subjects with NNA. Presently, this study suggests that both EBBX and TBBX give important but different information. To better understand the inflammatory process in asthma, both the proximal and distal airways need to be evaluated.

**FIGURE 1.** The mean numbers of eosinophils per volume of tissue in the transbronchial and endobronchial biopsies are shown in subjects with nocturnal asthma (NA) and subjects with nonnocturnal asthma (non-NA). The black bars represent the subjects with NA and the white bars represent those subjects with non-NA. Results are expressed as mean ± SEM.