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Lung alert

Smoking-induced emphysema is an autoimmune process

Emphysematous lung exhibits predominantly T helper type 1 (Th1) cells, but it remains unclear how tobacco induces Th1 immunity and the nature of relevant T cell antigens. This study explored the possibility that smoking induces an autoimmune response.

Isolated blood CD4+ T cells from patients with emphysema and controls were tested to see if a specific T cell response could be elicited using lung-derived elastin or collagen peptides as antigens. In response to elastin peptides, only peripheral blood CD4+ T cells from individuals with emphysema (n = 36) released interferon (IFN) γ and interleukin (IL)-10 and proliferated, compared with controls (n = 27) and patients with asthma (n = 9). There was a significant association between the increase in T cell secretion of IFN γ and IL-10 with disease severity, as assessed by CT-based quantification and pulmonary function testing. ELISpot analysis confirmed the presence of B cells secreting antibodies to elastin, but not collagen, in emphysematous lung. In addition, significantly fewer regulatory T (T_R) cells were present in the lungs of subject with emphysema.

Based on these findings, the authors proposed that exposure to cigarette smoke induces secretion of proteolytic enzymes from cells of the innate immune system that liberate lung elastin fragments. In susceptible individuals this may initiate T and B cell-mediated immunity against elastin.

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