

EFFECTS OF PROLONGED EXPOSURE TO CIGARETTE SMOKE ON PHENOTYPE AND FUNCTION OF INNATE IMMUNE CELLS IN THE LUNGS

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Cigarette smoke contains various toxic compounds that can alter the phenotype and function of immune cells within the lungs. To investigate how extended exposure to cigarette smoke affects innate immune cells (including neutrophils, macrophages, dendritic cells (DCs), natural killer (NK) cells, and natural killer T (NKT) cells), we exposed BALB/c mice to cigarette smoke for 4 or 8 weeks, with control animals being exposed to air. The cigarette smoke was generated using an LM1 Borgwaldt smoking machine. Flow cytometry analysis and intracellular staining of lung-infiltrated immune cells revealed that prolonged exposure to cigarette smoke notably increased the number of inflammatory cluster of differentiation (CD14) receptor-expressing neutrophils, tumor necrosis factor- α (TNF- α)-producing NK and NKT cells, and inflammatory cluster of differentiation (CD40)-expressing macrophages. Additionally, significantly higher numbers of interleukin-12 (IL-12) and interleukin-23 (IL-23) producing DCs were observed in the lungs of mice exposed to cigarette smoke for 8 weeks compared to those exposed to air. Moreover, a greater number of TNF- α , IL-12, and IL-23-producing macrophages, along with TNF- α -producing neutrophils, NK, and NKT cells, were found in the lungs of mice exposed to cigarette smoke for 8 weeks compared to those exposed for 4 weeks. In conclusion, prolonged cigarette smoke exposure promotes an inflammatory phenotype in lung-infiltrating innate immune cells, contributing to the progression and worsening of inflammatory lung diseases.

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