Immunological Effect of PM$_{2.5}$ on Cytokine Production in Female Wistar Rats

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Objective To investigate the immunological effect of PM$_{2.5}$ on cytokine production in female Wistar rats. Methods Female Wistar rats were given 0.3 mg, 0.75 mg, 2 mg, 5 mg of PM$_{2.5}$ per 0.5 mL saline, respectively. Saline was used as the negative control. TNF-$\alpha$ and IL-6 levels in the bronchoalveolar lavage were measured by ELISA, and mRNA expression levels in lung tissue were detected by RT-PCR. Alveolar macrophages were collected for testing phagocytic function. Results Exposure to PM$_{2.5}$ stimulated TNF-$\alpha$ production in a dose-dependent manner ($P<0.05$). No statistically significant difference was found. No time-dependent change in TNF-$\alpha$ and IL-6 production was found. The phagocytic rate (PR) was significantly decreased by PM$_{2.5}$ treatment. The phagocytic rate (PR) was significantly decreased by PM$_{2.5}$ treatment. Conclusion PM$_{2.5}$ exposure increases inflammation response of the lung in a dose-dependent manner. Moreover, tissue injury induced by PM$_{2.5}$ may be related to altered production of cytokines. PM$_{2.5}$ may impair the phagocytic activity of alveolar macrophages.

Key words: PM$_{2.5}$; Inflammation; Cytokine; Phagocytic function

REFERENCES


(Received July 10, 2007  Accepted October 12, 2007)