

Effects of maternal nicotine exposure on lung surfactant system in rats

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摘要

Abstract

Maternal smoking during pregnancy may impair pulmonary function in infants and children, but the exact mechanisms underlying these changes remain to be determined. Timed pregnant Sprague-Dawley rats were injected subcutaneously with nicotine at a dose of 2 mg/kg/ day from days 3-21 of gestation. A control group was injected with saline. Nicotine-treated dams had lower body weights than control dams from gestational days 5-21, and the values reached statistical significance on gestational days 17,20 and 21. Total lung saturated phosphatidylcholine contents tended to be lower in nicotine-exposed rats than in control rats from postnatal day 21, and the values reached statistical significance on postnatal days 35 and 42. Maternal nicotine exposure significantly increased surfactant protein (SP)-A, SP-B, SP-C, and SP-D mRNA expression on postnatal day 7, and decreased SP-A, SP-B, SP-C, and SP-D mRNA expression on postnatal day 14. In conclusion, maternal nicotine exposure during pregnancy reduces lung surfactant lipids and produces variable changes in surfactant protein gene expression during the late postnatal period. As good surface activity of pulmonary surfactant is essential for normal lung function, these results suggest that derangement of the pulmonary surfactant system may be important in the pathogenesis of impaired pulmonary function in children exposed in utero to nicotine. *Pediatr Pulmonol*