母鼠使用尼古丁對仔鼠肺臟膠原蛋白基因表現之影響

Maternal nicotine effects on lung collagen gene expression In newborn rats

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摘要.

動物實驗已證實母親懷孕時接觸尼古丁會影響胎兒生長、肺髒發育、以及出生時的肺功能。尼古丁是引起這些併發症的主要成份，因爲它會穿透胎盤，以比母體較高地濃度聚積在胎兒體內。我們評估母鼠給予尼古丁治療對仔鼠肺髒膠原蛋白基因的表現。目的在探討影響幼兒肺功能的機轉。我們使用定時懷孕的大白鼠，在懷孕第三天至二十一天，治療組每天每公斤皮下注射 2 毫克尼古丁，對照組則注射等量生理食鹽水。所有老鼠皆讓其自然產出。在出生後第一、七、十四、二十一天時，合組隨機選取幼鼠，麻醉後測量其體重及肺髒重量。以及反轉錄聚合測量肺髒膠原蛋白基因的表現及特殊染色看肺組織膠原蛋白的量。治療組母鼠的體重在懷孕第五天至第二十一天時比對照組低。出生後第一、七、十四、二十一天時，治療組仔鼠的體重及肺髒重量、肺髒膠原蛋白的表現及肺泡間壁膠原蛋白的量與對照組仔鼠是相當的。結論是母鼠尼古丁治療（每天每公斤 2 毫克）並不會影響仔鼠肺髒膠原蛋白的基因的表現及肺泡間壁膠原蛋白的量。

Abstract

We evaluated the effects of maternal nicotine treatment on collagen gene expression in newborn rat lungs. Timed pregnant Sprague-Dawley rats were injected subcutaneously with nicotine tartrate (2mg/kg/day) from day 3 to day 21 of gestation. A control group was injected with an equal volume of 0.9% NaC1. On days 1, 7, 14, and 21 after birth, rat pups were randomly selected from each group and lungs were removed for measurement of collagen gene expression and collagen contents by reverse transcription-polymerase chain reaction and histology, respectively. Body weights of nicotine-treated dams were lower than those of control dams from gestational days 5 to 21, and the values reached statistical significance on gestational days 17, 20, and 21. The body weight, lung weight, and lung/body weight ratio were comparable between control and nicotine-exposed rats. Lung collagen I and III mRNA expressions and collagen-staining pattern in alveolar septa were similar between control and nicotine-exposed rats during the study period. We conclude that maternal exposure to nicotine (2mg/kg/Day) during pregnancy does not influence collagen gene expression or collagen contents in postnatal rat lungs.