母鼠營養不良對仔鼠肺臟生長及胰島素樣生長因子系統表現的影響

Effects of maternal undernutrition on lung growth and insulin-like growth factor system expression in rat offspring

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摘要.

背景：懷孕母鼠若營養不良會影響後代仔鼠肺臟結構的發育。方怯：這項研究的評估母鼠在懷孕最後一周營養不良（給予控制組一半飼料量）對仔鼠肺臟的胰島素樣生長因子系統的影響。結果：營養不良的懷孕母鼠的體重從懷孕第 16 天到第 21 顯著地比控制組母鼠低。子宮內成長遲緩仔鼠的體重和肺重在出生後第 1，7，14，和 28 天顯著地比控制組仔鼠低，肺重和體重比在出生後第 7 天和 14 天也顯著地比控制鼠低。肺臟第一型、第二型胰島素樣生長因子，第一型、第二型受體，和胰島素樣生長因子的接合蛋白的基因表現隨老鼠年紀增加而增加，在出生後第 14 天達最大值。子宮內成長遲緩仔鼠的肺臟第一型、第二型胰島素樣生長因子的基因表現在出生後第 1 天和 28 天比控制組仔鼠高。而胰島素樣生長因子第一型、第二型受體和胰島素樣生長因子接合蛋白的基因表現在子宮內成長遲緩仔鼠和控制組仔鼠是相彷的。結論：這項研究提出子宮內成長遲緩仔鼠肺臟胰島素樣生長因子系統全面而概要的基因表現和各個成分發展調節的情形。

Abstract

Background: Maternal undernutrition may alter the development of the lung structure in rat offspring. Methods: We investigated the effects of maternal undernutrition (50% rations of the control food intake) during the last week of gestation on the expression of the rat lung insulin-like growth factor (IGF) system in the postnatal period. Results: Body weights of undernourished pregnant rats were significantly lower than those of control rats from gestational days 16 to 21. Rats subjected to intrauterine growth restriction (IUGR) exhibited significantly lower body weights and lower lung weights on postnatal days 1, 7, 14, and 28 and lower lung/body weight ratios on postnatal days 7 and 14 when compared with control rats. Lung IGF-Ⅰ, IGF-Ⅱ, IGF receptors types 1 (IGFR-1) and 2 (IGFR-2), and the IGF binding protein (IGFBP) mRNA expressions increased as rats aged and

reached a peak on postnatal day 14. Maternal undernutrition significantly increased IGF-Ⅰ and IGF-Ⅱ mRNA expressions on postnatal days 1 and 28. Lung IGFR-1, IGFR-2, and IGFBP mRNA expressions were similar between control and IUGR rats during the study period. Conclusions: This study presents a comprehensive overview of lung IGF system expression in control and IUGR rats and demonstrates the developmental regulation of each component.