

Effects of maternal undernutrition on renal angiotensin II and chymase in hypertensive offspring

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摘要

Abstract

Intrauterine growth restriction (IUGR) can program the future development of hypertension in adulthood. The renin – angiotensin system has been reported to play a role in IUGR-induced hypertension. The aims of this study were to investigate the effects of IUGR on renal angiotensin-converting enzyme (ACE), angiotensin II (Ang II) and chymase in IUGR-induced hypertension. Timed pregnant Sprague – Dawley rats received 50% rations of control food intakes from days 15 to 21 of gestation. Control rats received regular food throughout the pregnancies. Arterial blood pressure and glomerular number were measured and immunohistochemical studies were performed on kidney tissues in adult male offspring at 16 weeks of age. IUGR rats exhibited significantly lower body and kidney weights and reduced number of glomeruli when compared with control rats. IUGR rats had significantly higher systolic blood pressure than control rats. Immunoreactivity of ACE was comparable between control and IUGR rats whereas immunoreactivities of chymase and Ang II were significantly higher in IUGR rats than in control rats. In conclusion, immunohistochemical studies document up-regulation of ACE-independent Ang II and chymase in IUGR kidney and indicate that overactivity of chymase may result in increased intrarenal Ang II production, which could contribute to the development of hypertension in intrauterine undernourished rats.