Experimental oligohydramnios decreases collagen in hypoplastic fetal rat lungs

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摘要

Abstract

Neonates with premature rupture of the membrane and oligohydramnios have an increased risk of acute respiratory morbidity. The aims of this study are to investigate the effects of experimental oligohydramnios on transforming growth factor (TGF)-β1 and connective tissue growth factor (CTGF) expressions and collagen level in fetal rat lungs. On day 16 of gestation, we anesthetized timed pregnant Sprague-Dawley dams, punctured the uterine wall and fetal membranes of each amniotic sac which resulted in oligohydramnios. Fetuses in the opposite uterine horn served as controls. On days 19 and 21 of gestation, fetuses were delivered by cesarean section. Rats exposed to oligohydramnios exhibited significantly lower lung weight/body weight ratios on days 19 and 21 of gestation than did the control rats. Lung type I collagen and TGF-β1 mRNA expressions and lung collagen levels were significantly decreased in rats exposed to oligohydramnios on days 19 and 21 of gestation. Type I collagen and inhibitors of metalloproteinase-1 (TIMP-1) proteins were decreased and matrix metalloproteinase-1 (MMP-1) was increased in oligohydramnios-exposed rats on days 19 and 21 of gestation. CTGF mRNA expressions were comparable between control and oligohydramnios-exposed rats on days 19 and 21 of gestation. These data suggest that downregulation of collagen might be involved in the pathogenesis of oligohydramnios-induced respiratory morbidity.