Retinoic acid fails to reverse oligohydramnios-induced pulmonary hypoplasia in fetal rats

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摘要

Abstract

All-trans retinoic acid (ATRA) stimulates platelet-derived growth factor (PDGF)-A expression and enhances alveolarization in rat lungs. On d 16 of gestation, pregnant Sprague-Dawley rats were randomly assigned to either a retinoic acid group (intragastric ATRA at 10 mg/kg body weight) or a vehicle group. We punctured each amniotic sac, and fetuses in the opposite uterine horn served as controls. On d 21 of gestation, the fetuses were delivered by cesarean section. Rats subjected to oligohydramnios exhibited significantly lower lung weights and lung/body weight ratios, and ATRA had no effects on the body or lung weights of oligohydramnios-exposed rats. Lung PDGF-A and -B mRNA expression was significantly lower in oligohydramnios-exposed rats compared with control littermates of maternal vehicle-treated dams. Maternal retinoic acid treatment significantly increased PDGF-A and -B mRNA expression in control and oligohydramnios-exposed rats compared with all rats and oligohydramnios-exposed rats of maternalvehicle-treated dams, respectively. Rats exposed to oligohydramnios exhibited a significantly lower generation of alveolar saccules than did control rats in the maternal retinoic acid- and vehicle-treated groups. In this model, maternal retinoic acid treatment showed no positive effects on oligohydramnios-induced pulmonary hypoplasia in the pseudoglandular stage.