

Effect of Ozone and Pregnancy Complications on the Risk of Preterm Birth: a Population-Based Case-Control Study in Taiwan

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Background: There is evidence suggesting that prenatal exposure to ambient air pollutants may cause preterm births, but few studies have elaborated the relationship between the air pollution and pregnancy complications on the risk of preterm births.

Objectives: To assess the association between exposure to air pollution and gestational complications on the risk of preterm births.

Methods: We conducted a population-based case-control study of 1,510,064 singleton births from Taiwanese birth registry during 2001 to 2007. The case group consisted of 86,224 preterm births and the control group included 344,896 births randomly sampled one to four from source newborns. Inverse distance weighting approach was used to calculate average monthly exposure parameter for criteria air pollutants. Logistic regression models with and without potential confounders were used to estimate odds ratios between air pollution and preterm birth.

Results: Preterm birth was increased in association with a 10 ppb increase in the first trimester (adjusted OR=1.03, 95% CI: 1.02, 1.04), second trimester (adjusted OR=1.02, 95% CI: 1.01, 1.02) and third trimester (adjusted OR=1.02, 95% CI: 1.01, 1.03) O₃ level. The odds ratios for O₃ were ranged from 1.01 to 1.04 among each trimester in multi-pollutant model. The results also show there were effect modification between O₃ and gestational diabetes mellitus on preterm birth by stratifying analysis.

Conclusions: The present study provide evident that exposure to O₃ during the pregnancy period may increase the risk on preterm birth, particularly for those who have gestational diabetes mellitus women.