

P194. A nationwide case-control study of gestational diabetes mellitus in association with air pollution in Taiwan

C Li (TW) [1]

Objective ? Mounting evidence has shown an increased risk of gestational diabetes mellitus (GDM) in association with elevated exposure to air pollution. However, limited evidence is available concerning the effect of specific air pollutant(s) on GDM incidence. This study aimed to investigate the respective effect of exposure to individual air pollutant at pre- and post-conception periods on GDM incidence.

Methods – A case-control study design was used in which both cases and controls were selected from a cohort of one million people randomly selected from all beneficiaries registered with Taiwan's National Health Insurance program in 2005.

Participants – Totally 6,717 mothers with GDM diagnosed in 2006-2013 and 6,717 control mothers free from GDM were selected by matching on age and year of delivery.

Intervention – N.A.

Main Outcome – GDM

Measures – Maternal exposures to mean daily air pollutant concentration, derived from 76 fixed air quality monitoring stations, within the 12-week period prior to pregnancy, as well as during the 1st and 2nd trimesters, respectively were assessed by the spatial analyst method (i.e., ordinary kriging) with the ArcGIS. Information on GDM diagnosis was derived from medical claims with ICD-9-CM code: 648.0 or 648.8.

Results – After controlling for potential confounders and other air pollutants, an increase in pre-pregnancy exposure of 1 inter-quartile range (IQR) for PM_{2.5} and SO₂ was found to associate with a significantly elevated odds ratio (OR) of GDM at 1.10 (95% confidence interval (CI) 1.03-1.18 and 1.37 (95% CI 1.30-1.45), respectively. Exposures to PM_{2.5} and SO₂ during the 1st and 2nd trimesters were also associated with significantly increased ORs, which were 1.09 (95% CI 1.02-1.17) and 1.07 (95% CI 1.01-1.14) for PM_{2.5}, and 1.37 (95% CI 1.30-1.45) and 1.38 (95% CI 1.31-1.46) for SO₂. No significant associations of GDM with O₃ or NO₂ were observed

Conclusions – It was concluded that higher pre- and post-pregnancy exposures to PM_{2.5} and SO₂ for mothers were associated with a significantly, but modestly elevated risk of GDM.

[1] National Cheng Kung University, Tainan