

中文題目：懸浮微粒 PM2.5 與糖尿病風險有關

英文題目：Fine particulate matter PM2.5 related to risk of diabetes mellitus

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Background Exposure of particulate matter less than 2.5 μm (PM2.5) can elevate Tumor necrosis factor (TNF)- α , interleukin-6 (IL-6), and leptin levels, which may cause insulin resistance and development of diabetes mellitus (DM). The outdoor leisure and exercise at air pollution may alter energy expenditure and cardiometabolic disease may emerge. Thus, we conducted a nationwide cohort study to investigate the relationship between air pollution and risk of DM under the Taiwan Air quality Monitoring Database (TAQMD) and Taiwan National Health Insurance Research Database (NHIRD).

Method Using the LHID 2000, we enrolled the study cohort aged ≥ 20 years visiting the outpatient clinic with diagnosis of acute common cold (ICD-9-CM code 460) between 2000 and 2011. The first diagnosis date of acute common cold was set as the index date. We located the study participants at which air quality monitoring stations by visiting local healthcare institution. Annual average exposure concentration of PM2.5 were recorded for these study participants. We further divided the exposure concentration of PM2.5 into IQR levels: the first quartile (Q1, $<29.5 \mu\text{g}/\text{m}^3$), the second quartile (Q2, $29.5\text{-}33.3 \mu\text{g}/\text{m}^3$), the third quartile (Q3, $33.4\text{-}41.2 \mu\text{g}/\text{m}^3$), and the fourth quartile (Q4, $> 41.2 \mu\text{g}/\text{m}^3$). All participants were followed from the index date until the date that the newly diagnosis of DM.

Results The 158,038 participants (69,688 men and 88,350 women) were enrolled. The mean age of the study participants was 40 ± 14.5 years. The incidence of DM in participants increased following annual concentrations of PM2.5 (2.81 in Q1, 3.06 in Q2, 3.65 in Q3, and 3.89 in Q4 per 10,000 person-year). After controlling potential variables, the participants exposed to PM2.5 concentrations in Q2, Q3, and Q4 exhibited 1.14- (95% CI 1.05, 1.23), 1.40- (95% CI 1.30, 1.50), and 1.42-fold (95% CI 1.32, 1.53) adjusted hazard ratio (aHR) of developing DM when we compared with those participants exposed to Q1 concentration of PM2.5.

Conclusion The current study suggested that exposure of PM2.5 is related to increased risk of DM.