

ASSOCIATION BETWEEN AIR POLLUTION AND GLUTATHIONE S-TRANSFERASE (GST) P1 ON ASTHMA AND WHEEZING AMONG CHILDREN IN TAIWAN

AIR POLLUTION AND GSTP1 ON ASTHMA AND WHEEZING IN CHILDREN

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Background and Aims: There are limited studies on the role of interaction between exposure to ambient air pollution and glutathione-S-transferase (GST) P1 on the risk of asthma and wheezing among children, which provided suggestive, but inconclusive results. The present study was to assess the joint effect of air pollutants and *GSTP1* on the risk of asthma and wheezing in Taiwan Children Health Study

Methods: We conducted a nationwide cross-sectional study of 5,049 Taiwanese children in 2007. The studied determinants were three *GSTP1* Ile105Val (rs 1695) genotypes (Ile-Ile; Ile-Val and Val-Val) and exposure to ambient air pollutants. We used routine air-pollution monitoring data for sulphur dioxide (SO₂), nitrogen dioxides (NO₂), ozone (O₃), carbon monoxide (CO), and particles with an aerodynamic diameter of 2.5 µm or less (PM_{2.5}). The exposure parameters were calculated using community annual average concentration. The effect estimates were presented as odds ratios (ORs) per interquartile changes for NO₂, CO, SO₂, PM_{2.5} and O₃.

Results: In a two-stage hierarchical model adjusting for confounding, the risk of asthma was decreased with PM_{2.5} (adjusted odds ratio (OR) 0.60; 95% confidence interval (CI) 0.45, 0.82), and O₃ (OR 0.74; 95% CI 0.60, 0.90) among Ile105 homozygotes, but not among those at least one Val105 allele (interaction p value=0.001 and 0.03, respectively). A similar tendency of effect modification between PM_{2.5} and O₃ and *GSTP1* on the risk of wheezing was found.

Conclusions: Children who carried Ile105 variant allele may be protected from the increased risk of asthma and wheezing of ambient air pollutants, especially in PM_{2.5} and O₃.