Associations Between Fine Particulate Matter (PM_{2.5}) and Childhood-Onset Systemic Lupus Erythematosus

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To the Editor: Although it is not clearly known what factors play a role in the pathogenesis of childhood-onset systemic lupus erythematosus (cSLE), it has been reported that exposure to SO₂ and O₃ lead to an increase in pediatric rheumatic diseases hospitalizations, and exposure to PM₁₀, NO₂, and CO may increase the risk of disease activity in cSLE [1, 2]. Recently, a study from Brazil demonstrated that short-term exposure to both indoor and outdoor PM_{2.5} was associated with increases in airway inflammation and systemic inflammation in cSLE patients [3]. However, these studies only assess the exposure to PM_{2.5} and the disease activity and hospitalization over a short period of time. There are limited studies examining the association between PM_{2.5} variation and the incidence of cSLE over a long period of time. Therefore, our objective was to evaluate the effects of air pollution on the risk of developing cSLE in Taiwan from 2000 to 2012.

Chen-Hao Mai and Yen-Ju Shih contributed equally to this work.

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This is the first large population study to evaluate the exposure of ambient PM_{2.5} and the occurrence of cSLE over a long period of time. A total of 394 children (0.16%) were newly diagnosed with cSLE during the observation period. The incidence rate for cSLE increased with PM_{2.5} levels, from 4.7 (Q1) to 21.9 (Q4) per 100,000 person-years. In the multivariable Cox proportional hazard regression, the adjusted HR for SLE increased with the PM_{2.5} exposure concentrations from 2.74 to 4.23 compared with that for those exposed to the corresponding concentrations in the Q1 level.

This longitudinal study provides evidence that long-term variations in PM_{2.5} levels are risk factors for the development of cSLE. Although further studies are required to confirm these associations, our study suggests that awareness, education, and appropriate public policy for better air quality will result in a lower incidence of cSLE and will improve public health.

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Declarations

Conflict of Interest None.

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