

Air Pollution as a Potential Determinant of Rheumatoid Arthritis: A Population-based Cohort Study in Taiwan

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Abstract

Background: Limited studies have explored the relationship between air pollution and rheumatoid arthritis (RA), with the results being somewhat inconsistent.

Methods: This was a retrospective cohort study that included 322,301 subjects aged 30–50 years, selected from the National Health Insurance Research Database in Taiwan, were followed from 2001 to 2010. We used a time-dependent extended Cox model and incorporated time-dependent variables to estimate the associations between the annual mean concentrations of air pollutants with RA, including carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particles with an aerodynamic diameter less than 10 μm (PM₁₀), and sulfur dioxide (SO₂), and reported the hazard ratio (HR) and 95% confidence interval (CI).

Results: Newly diagnosed RA was positively associated with a 100-ppb increase in CO (adjusted HR = 1.17 [95% CI = 1.16, 1.18]), a 10-ppb increase in NO₂ (1.54 [1.45, 1.64]), a 10-ppb increase in O₃ (1.37 [1.33, 1.41]), and a 1 ppb in SO₂ (1.02 [1.00, 1.04]). There was no association between a 10-μg/m increase in PM₁₀ and RA (1.02 [0.99, 1.05]).

Conclusions: Our finding suggests that O₃ and traffic-related air pollutants (CO and NO₂) may be positively associated with incident RA. This is an important finding given that many individuals are exposed to similar levels of O₃ and NO₂ globally.