

Associations of Reproductive Risk Score and Joint Exposure to Ambient Air Pollutants with Chronic Obstructive Pulmonary Disease: A cohort study in UK Biobank

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Abstract

Objective: To construct a reproductive risk score (RRS) and an air pollution score (APS) and assess independent and joint associations between the two with incident COPD risk. **Design:** Population-based prospective cohort study. **Setting:** UK Biobank. **Population:** 78,218 female participants aged 40–69 years without baseline COPD recruited between 2006 to 2010. **Methods:** RRS was constructed by 17 women’s reproductive health-related items, and APS incorporating PM_{2.5}, PM_{2.5-10}, PM₁₀, NO₂, and NO_x was calculated to assess the joint exposure level. The associations of RRS and APS with COPD were examined by Cox proportional hazards regression. **Main Outcome Measures:** The outcome of the incident COPD was identified through the in-patient hospital register. **Results:** Higher RRS was associated with an increased risk of COPD (adjusted HR: 1.15, 95% CI: 1.12-1.19, P trend < 0.001). A dose-response manner can be observed between higher quintile APS and increased COPD risk (P trend < 0.001). The RERI of 0.030 (95% CI: 0.012-0.048) showed additive interaction between RRS and APS on COPD was significant. In the joint analysis, the combinations of both higher RRS and APS signified higher incident COPD risk. **Conclusions:** High RRS and high APS were associated with increased COPD risks in a dose-response pattern. Using comprehensive indicators to identify women’s reproductive risk factors, together with the control of air pollution, is effective for COPD prevention.

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