

Time-Dependent Relationship Between Particulate Matter Exposure and COPD Exacerbations

L. Pini¹, J. Giordani¹, G. Gardini¹, C. Concoreggi², A. Pini³, M. Ciarfaglia¹, R. Magri⁴, C. Tantucci¹; ¹Clinical and Experimental Sciences, University of Brescia, Brescia, Italy, ²Department of Emergency Medicine, ASST-Spedali Civili, Brescia, Italy, ³Departement de épidemiologie d'Intervention et Formation, Epicentre, Paris, France, ⁴Respiratory Medicine Unit, ASST-Spedali Civili, Brescia, Italy.

Corresponding author's email: laura.pini@unibs.it

Rationale This study aims to determine a relationship between short-term exposure to Particulate Matter and Fine Particulate Matter (PM₁₀ and PM_{2.5}) and the Emergency Department (ED) visit's trend for COPD Exacerbation. Visits' outcomes were also evaluated. The analysis has been conducted in Brescia, a city recognized for being one of the most important European industrial realities and one with the most complex environmental issues. **Methods** For this study, a dedicated database with data exclusively focused on COPD Exacerbation-related ED admissions has been created. Starting from January 1st, 2014, to January 2016, 431 ED admission records for COPD Exacerbation have been collected. Data for the Particulate Matter daily mean concentrations were collected from the Environmental Protection Regional Agency (ARPA) and added to the database. Finally, a time-series analysis with distributed day-lag has been conducted, and the results have been expressed in terms of Relative Risk (RR) and Relative Risk Increase (ER) for COPD Exacerbation-related ED visits and/or hospitalizations, over a 10µg/m³ increase in PM₁₀ or PM_{2.5} concentration. **Results** A significant association for both PM₁₀ and PM_{2.5} with the risk of ED visits and/or hospitalization for COPD Exacerbation. In lag0-1, increases of 10µg/m³ in PM₁₀ concentration corresponded to a RR(IC95%) for ED visit of 1.06, while, for PM_{2.5}, corresponded to 1.08 (p<0.05). At lag0-5, the RR(IC95%) corresponded to 1.06 and 1.09 for PM₁₀ and PM_{2.5} respectively (p<0.05). Considering the hospitalizations, similar results have been found, with a RR of 1.07 and 1.10 in lag0-1; 1.07 and 1.11 in lag0-5. **Conclusions** Our findings increase the knowledge regarding the short-term effects of exposure to Particulate Matter on the respiratory system. This study could also provide reliable data to monitor ED visits and outcomes over time.

This abstract is funded by: None

Am J Respir Crit Care Med 2021;203:A2294
Internet address: www.atsjournals.org

Online Abstracts Issue