

A CASE-CROSSOVER STUDY OF HOSPITAL ADMISSIONS FOR CORONARY HEART DISEASE AND METALS IN AIR POLLUTION NEAR AN ITALIAN STEEL PLANT

Fabio Barbone, *DSMB, Udine University, Italy*

Anica Casetta, *DSMB, Udine University, Italy*

Ettore Salvagni, *ARPA FVG, Italy*

Flavio Moimas, *ARPA FVG, Italy*

Gianna Zamaro, *Health Cities, Udine, Italy*

Background and Aims: Variation in the chemical composition of fine dust might entail different acute and chronic cardiovascular risks. To evaluate the association of daily levels of metals in outdoor air with acute hospital admissions for coronary heart disease (CHD), we conducted a case-crossover study in a population located near a large steel plant.

Methods: A GIS mapped residential history of Friuli Venezia Giulia population (Northeastern Italy) was completed. Among residents within 5km from the main chimney of the steel plant, we mapped cases of CHD (ICD9CM 410-414) admitted between 8/1/2002 and 3/9/2007. Concurrently, daily air concentration of Mn, Fe, Ni, Zn, Cd, Pb, Cr, V and As was measured at a monitoring station located 600 m from the chimney. We used the time-stratified approach for the case-crossover analysis, i.e., referent days were the same day of the week within the same month as the index day. As exposure we considered the average of the cumulative 0- to 2-day lag for each metal. Conditional logistic regression, adjusted for outdoor temperature and humidity, was used to estimate the OR of CHD hospitalization by quartile of exposure and to evaluate trends. Analyses were conducted for cases located within 5km, 2km, in the prevalent wind direction (to SW) and by gender. Case validation with hospital charts is underway.

Results: 274 residents in the area were hospitalized for CHD. Among cases within 5km from the point source, results did not show consistent associations. However, within 2km from the steel plant, the risk of CHD hospitalization increased significantly at higher Mn, Zn and Pb levels. Among cases residing in the SW quadrant the association was even stronger, especially among women, and involved also Cd and Cr.

Conclusions: This case-crossover study provides evidence that environmental exposure to metals may act as a trigger of CHD hospitalization.