The effect of air pollution on the incidence of asthma symptoms

MUDr. Helena Velická

ABSTRACT

The aim of the thesis was to establish the effect of short-term ambient air pollutant concentration changes on asthma exacerbation and symptom variability.

The study concerned 147 child patients (age 6 - 18 years) and 304 adult patients (age 19 - 62 years) with confirmed diagnosis of asthma. Their respiratory symptoms and other complaints were recorded in diaries during the heating season (November 2013 - February 2014) in the high-polluted industrial city of Ostrava, Czech Republic. The concentrations of PM_{10}, NO_2 and SO_2 were measured and provided as smoothed daily maps. GPS coordinates of two addresses of each respondent (the residence and the school/work) were linked with the maps and 24-hour exposure of the respondents to each pollutant was determined, regarding the individuals’ daily pattern. The relationships between exposures and health effects were analyzed using Generalized Additive Models (GAM) and expressed as odds ratios per 10 μg/m^3 increase in the mean 24-hour exposure at the same day, and also in lag days (1-5), both separately and as moving averages (1-5).

Significant associations were found between increase of one- to several days exposure to air pollutants and asthma symptom incidence both in children and adults.