

Estimation of Cardiovascular and Respiratory Mortality and Mortality Related to PM₁₀ and PM_{2.5} Pollutants in Ardabil City in 2018 (Using Air Q Model)

Abstract:

Clean air is considered as a basic need for human health. However, air pollution is a significant threat to health in developed and developing countries. The aim of this study was to estimate the health effects attributed to PM₁₀ and PM_{2.5} pollutants in the air of Ardabil in 2018 (using Air Q model). Raw data related to particles were collected from the department of Environment and processed in Excel software and converted into an input file of the AirQ + model, and in the final stage, by considering appropriate epidemiological parameters and combining these data with air quality data, it was possible to estimate the health effects of air pollution. The results showed that the average annual concentrations of PM_{2.5} and PM₁₀ were 15.47 and 30.94 in the study year, respectively. The total number of deaths due to ALRI, COPD, lung cancer, IHD and stroke deaths on average during the study period were estimated to be 73, 11, 7, 15, and 14 deaths, respectively, which include 14.62, 15.78, 4.9, 12.43, and 11.6% of deaths due to ALRI, COPD, lung cancer, IHD and stroke deaths, respectively. In conditions of concentration above 5 micrograms per cubic meter, attributed proportion, total number of attributed cases and number of attributed cases per 100,000 population with moderate relative risk and confidence interval of 95% for cardiovascular diseases has been estimated to be 0.95% 103 people and 19.42 people. Also, the attributed proportion, the total number of attributable cases and the number of attributable cases per 100,000 population for the admission of respiratory diseases have been estimated at 1.97%, 68 persons and 12.77 persons, respectively. The number of cases attributable to PM₁₀ for various health outcomes asthma symptoms in children, incidence chronic bronchitis in adults, prevalence bronchitis in children and mortality in children after birth are 249, 312, 2745 and 490, respectively. The year was studied. Our results suggest that particle exposure even at low concentrations is associated with an increased risk of overall mortality and specific cause mortality and hospital admissions for respiratory and cardiovascular diseases.

Keywords: Health effects, PM_{2.5}, PM₁₀, Ardabil, Air Q +