URBAN AIR POLLUTION AND EMERGENCY VISITS AND IN-HOSPITAL MORTALITY IN TEHRAN HEART CENTER

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Background and Aims: Tehran -the capital of Iran- with a population of approximately 7.9 million, only 30% of the days in a year profits healthy air quality. Critical air pollution happened in the June 2009 that resulted in closure of governmental offices in this city. The aim of this study was to evaluate the effect of air pollution on the emergency visit, hospitalization and in-hospital mortality of acute coronary syndrome (ACS) patients referred to a referral heart center (THC) in the capital of Iran.
Methods: Patients admitted to the emergency ward of THC between 22 June and 22 July 2009 were included in this cross sectional study. Meteorological data were obtained from "Air Quality Control Corporation Geophysics station" which is located about 1000 meters away from THC. A principal component analysis was utilized to extract a linear combination of air pollutants which represented eigenvalue > 1. Then, a regression analysis was utilized to determine the air pollution exposure level and the frequency of patients admitted with unstable angina, myocardial infarction and arrhythmia. The principal component linear combination was considered as the exposure level for the regression analysis.
Results: Three thousands and ninety patients were included. The mean daily number of patients referred to THC was 112.5±12.6 during the polluted period and 100.8±17.6 during the other days ($P<0.001$). Hospitalization rate and the in hospital mortality were 20.0±4.9 and 0.9±0.1 during the pollution period compared to 17.0±3.9 and 0.2±0.4 in other days ($P<0.001$).
The proportion of patients aged 85 and more referred to THC, was directly associated with the concentration of PM-10 during the study period. The principal component score was higher in admission date of patients expired during hospitalization compared to that of patients discharged alive from the hospital ($P<0.05$).
After adjustment for the effect of age, sex, smoking, hypertension, hyperlipidaemia and diabetes, a statistically significant relationship between principal component score at the admission date of patients and the frequency unstable angina ($P<0.05$) and arrhythmia ($P<0.05$) was detected.
Conclusions: Air pollution is associated with increased emergency visit and hospitalization of patients, especially elderly, referred with unstable angina and arrhythmia. It is also associated with increased in-hospital mortality of patients admitted with ACS.

References:

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