Big data analysis on the impact of air pollutants on hospitalization of respiratory diseases in Shenzhen, China

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Abstract:

Statement of the Problem: Researches on air pollutants and their negative impact on public health in China is mostly concentrated in cities with certain pollution problems such as Beijing, Jinan and Shenyang, etc., and for cities with relatively low pollution levels, less research. Despite the rapid economic development, Shenzhen's air quality is still generally good. The characteristics of large cities and low pollution make Shenzhen have unique advantages in conducting air pollution and population health research and revealing the hospitalization of people in low-concentration air pollution environment. Methodology & Theoretical Orientation: The data were used include daily inpatients' data whole of respiratory diseases in 98 hospitals, daily air pollutants (PM2.5, PM10, SO2, NO2, O3, CO) concentrations and meteorological and wind direction data all in Shenzhen, China from January 1, 2013 to December 31, 2013. The relationship between the concentration of atmospheric pollutants and the number of hospitalized patients with respiratory diseases was analyzed using a time series generalized additive model (GAM). Findings: In the study of Shenzhen, the generalized additive model including single pollutants showed that there were lag and cumulative effects of SO2, NO2, O3, CO, PM10 and PM2.5 on the number of hospitalizations of respiratory diseases. Among them, the moving average value of SO2, NO2, PM10 and PM2.5 with lag accumulation of 8 days (Lay07) had the largest ER value associated with the number of hospital admissions for respiratory diseases, and O3 had the largest ER value at 5 days (Lay04). The generalized additive model including multiple pollutants showed that both PM10 and PM2.5 had significant effects on the hospitalization of respiratory diseases, while the effects of SO2, NO2, O3 and CO were not significant.

Conclusion & Significance: PM2.5 and PM10 are the primary pollutants affecting the hospitalization of public with respiratory diseases in Shenzhen, China.

Biography:

Liang Shi, MD & PhD is the vice president and chief physician, Shenzhen Occupational Diseases Control and Treatment Center, China. He is also the postgraduate tutor of Jilin University, China. He dedicate to study occupational and environmental medicine, epidemiology, and health service management. He has won 1 municipal, 6 provincial and ministerial science and technology awards. He won the 2011 health management award of the Chinese medical association.