Seasonality in Pediatric Asthma Admissions: Role of Climate and Environmental Factors

林恆慶
Xirasagar S;Lin HC;Liu TC

Abstract

BACKGROUND: Population-based data from Taiwan are used to examine seasonality in pediatric asthma admissions (proxy for asthma exacerbations) and associations with air pollutants and climatic factors. Monthly admission rates per 100,000 population, classified into three age groups, 0 approximately 2, 2 approximately 5, and 6 approximately 14 years (calculated from a total of 27,275 hospitalizations during 1998-2001) were subjected to autoregressive integrated moving average (ARIMA) modeling to examine seasonality. Spearman rank correlations were used to examine associations with criterion air pollutants (PM(10), SO(2), CO, O(3), NO(2)) and meteorological factors (ambient temperature, relative humidity, atmospheric pressure, rainfall, and sunshine hours). RESULTS: Both seasonality and associations with air pollutants and climate factors vary by age group. Among under-twos, the rates are lowest in January-February and highest in November, with a trough in June-July. Among preschoolers, the rates are lowest in June-July and highest in November, with two upsurges in August and March. Among school-goers, admission rates are lowest during June-August, with upsurges in March and September. The number of weather and pollutant predictors increases with age. Among under-twos, only two factors, PM(10) and rainfall, significantly predict admissions. For preschoolers, five factors (PM(10), CO, O(3), temperature, and pressure), and for school-goers, all air pollutants except NO(2,) and all climatic factors except rainfall are significant. CONCLUSION: Seasonality in pediatric asthma admissions vary by age in a subtropical island setting.