

TEMPERATURE, AIR POLLUTION AND PEDIATRIC HOSPITALIZATIONS IN MEXICO CITY

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Background and Aims: Studies have documented associations between temperature and mortality or hospital admissions. Impacts may be exacerbated in cities with high levels of air pollution, like Mexico City (MC). Thus, the objective of this study is to evaluate the association between increased temperature and pediatric hospital admissions in MC due to all causes and respiratory diseases during: dry-cold, dry-warm, and wet season adjusting for air pollution.

Methods: An ecological study was conducted using a retrospective time series analysis of daily admissions records from 11 pediatric hospitals, temperature, humidity, ozone (O₃) and particulate matter less than 10 microns (PM₁₀) in MC from 2000 to 2002. The accumulated risk of hospital admissions due to temperature was evaluated using generalized additive models (GAM) with Poisson regression, adjusting for seasonal trends, holidays, humidity, 8-hr maximum moving average of O₃ and average PM₁₀ with natural spline functions and different degrees of freedom per year.

Results: A total of 37,018 hospital admissions were evaluated for all causes of illness, of which 9,067 corresponded to respiratory illnesses. During the study period, the maximum average temperature was 23.7°C, 27.5°C and 24.8°C during the dry-cold, dry-warm and the wet period, respectively. The O₃ concentration was 165.25 ppb during the dry-warm period. During this same period, for every 1°C increase in temperature a percentage increase risk of hospital admissions for children under 5 years old was 2.49% (95% CI: 1.56, 3.43) for all causes of illness and of 6.39% (95% CI: 4.38, 8.45) for respiratory causes, with a lag of 4 days.

Conclusions: There is an increased risk of respiratory disease associated with the increase in the maximum daily temperature during the warm period in the population of children in MC, controlling for O₃ and PM₁₀, pollutants associated with the increase in morbidity in this city.