

EFFECTS OF DIURNAL TEMPERATURE CHANGES ON ASTHMATIC CHILDREN: A CASE CONTROL STUDY

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Background and Aims: The prevalence of childhood asthma has been increasing in Taiwan despite the efforts of air pollution control. This case-control study was performed to evaluate whether diurnal temperature changes may affect the exacerbation of asthma.

Methods: Data on both climate factors and air pollutants were obtained from local governmental agencies. During our year long study period, the case group was defined as the days of admission for asthma and the other days were classified as the control group. The days with admissions included the days when patients under 18 years of age were admitted to hospitals with the chief problem of asthma. We assessed 7,623 patients with asthma (age ≥ 18) and compared the characteristics between these two groups of days, including diurnal temperature changes. Multiple linear regressions were used to assess the effects of both temperature changes and air pollution.

Results: The effects of diurnal temperature changes were relatively consistent in a given geographic area during a specific season. During the winter period, there were positive correlations in the regions south of the Tropic of Cancer and negative correlations in the northern regions. In other seasons, we found positive associations in plain regions near the coastline and negative associations in mountain regions away from the coastline.

Conclusions: Diurnal temperature changes may affect the exacerbation of childhood asthma, but the effects vary across different geographic areas and seasons. The relatively consistent trends in a given season within a given geographic zone indicated both the seasons and landforms might affect the associations. The diurnal changes of temperature can be an important index to predict the acute onset of asthma, and it may affect the exacerbation of asthma in children through the mechanism of physical accommodation.

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