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Seasonal trend in paediatric asthma admission in Tsuen Wan area and its relationship with environmental factors

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Introduction

Asthma severity is related various environmental factors such as temperature, air pollution and influenza-like disease rate. Management of asthma must take into account the seasonal variation in asthma severity and its interaction with numerous environmental factors in order to achieve better control

Objectives

To examine the seasonal trend in asthma admission in a hospital paediatric department in Tsuen Wan area between 2010 and 2012 and to ascertain the relationship between several commonly used environmental indexes and paediatric asthma admission rate.

Methodology

Monthly average air temperature, relative humidity, air pollution indexes (API) in Tsuen Wan area and monthly influenza disease rate were retrieved from the internet. Hospital admission rate between January 2010 and December 2012 for asthmatic children between the age of four and eighteen was obtained. Seasonal trends in all the above information were plotted. Correlation between various environmental indexes and asthma admission rate was performed.

Result

Result: four hundred and forty paediatric asthma admissions was registered (M:F = 1.9:1). Asthma admission was low admission in April and August but peaked in June and December. Average air temperature was highest in August and lowest in January while relative humidity was highest in June and lowest in December. The average API showed a v-shaped trend over the year, with a trough in July. Monthly influenza disease rate peaked between February and May and again in September. Linear regression analysis showed that the correlation coefficients (r) between asthma admission VS air temperature, relative humidity, API and influenza infection rate were -0.129 (CI -0.452 to 0.193, p=0.42),-0.092 (CI -0.361 to 0.176, p=0.490), 0.051 (CI -0.129 to 0.231, p=0.571) and 0.034 (CI -0.165 to 0.233, p=0.732) respectively.

Subgroup analysis on both sexes and Poisson regression did not show any significant correlation between asthma admission and various environmental indexes. Outcome: there was a bimodal asthma hospital admission pattern over the year in Tsuen Wan area. Close follow-up and preventive measures should be ensured well before admission peaks. However, we have failed to show any correlation between asthma admission and various commonly used environmental indexes. Other more sophisticated environmental indexes, human or social factors need to be used to predict asthma admission.