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THE CHARACTERIZATION OF POLLEN AND FUNGAL SPORE AEROALLERGENS IN THE ATMOSPHERE OVER BARBADOS AND THEIR ASSOCIATION WITH ASTHMA IN THIS CARIBBEAN ISLAND.

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Objectives: To identify the pollen and fungal spores in the atmosphere over Barbados, determine their concentration and assess their impact, together with rainfall, on asthmatic attendances to the Accident and Emergency Department (A&E) of the Queen Elizabeth Hospital (QEH).

Design and Methods: Air was sampled at two locations in Barbados from May 2000 to April 2001. The daily pollen and spore counts were calculated, and these, together with daily rainfall values, were compared to the number of asthmatics attending the asthma bay of the QEH.

Results: Several species of pollen (95% grass; 4% tree and 1% weed) were identified in the aeroflora of Barbados. The most common grass pollen was *Andropogon intermedius* and the most common tree pollen was *Cordia sebestena*. 45 spore types were identified of which the most common were *Cladosporium* during dry weather and ascospores during rainy weather. There was a noticeable increase in grass pollen concentration during September and October coinciding with increased visits to the asthma bay. Fungal spore concentration rose earlier in mid-July and remained so until October. Pollen counts from trees remained low during the entire study period. Neither pollen nor spore counts correlated with the increase asthmatic attendances in mid-May to mid-June. Correlation was only found with increased rainfall during this period.

Conclusion: A variety of pollens and spores were identified in the atmosphere in Barbados. Pollen counts rose sharply during the wet months of September and October coinciding with increased asthma visits at the QEH. These results suggest that starting prophylactic treatment in allergic individuals by late August may reduce both allergic symptoms and asthmatic attacks. Providing such information regularly to the public and health authorities can assist considerably in reducing the impact of allergic diseases on society.

Introduction

Barbados is a small 166 square mile Island State and is the most easterly (13.8^0 N, 59.43^0W) in the eastern Caribbean. There are no heavy industries which send smoke and particulate matter into the atmosphere and no inland chemical plants producing chemical pollutants. The climate is predominantly pleasantly warm year round without severe changes in seasons.

Over the period of this study, monthly rainfall figures varied over a wide range, between 7.4 millimeters in March 2001, (the driest month in thirty seven years) and 365.0 millimeters in November 2000. This rainfall impacts directly on the production of spores from fungi and pollen from grass, trees and weeds. There are no genera which produce allergic pollen on the Island like Ragweed, Birch or Oak but there is significant asthma morbidity on the Island.

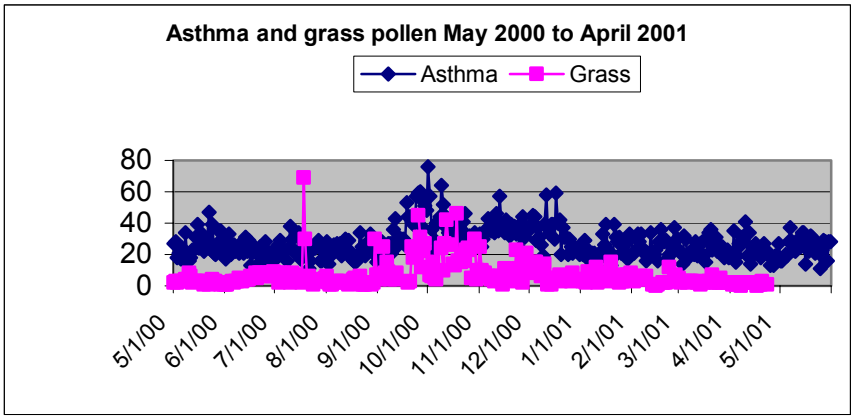
A pattern of allergy is well recognized in temperate countries. There is allergy to grass pollen in the early to mid summer months, followed by Ragweed allergy in late summer and early autumn and mould allergy in autumn (Lewis, 1983, Garty et al. 1998). Even though the climate of the Caribbean, including Barbados, favors the growth of moulds, weeds and grasses, which are important causes of allergic respiratory disease, this pattern of seasonal allergic response has not been described in the Caribbean.

Asthma in Barbados is on the increase and the number of patients seeking medical attention at the Accident and Emergency Department (A&E)) of the Queen Elizabeth Hospital (QEH), a public primary acute care facility, because of acute attacks, has risen from 1,886 in 1973 to 11,447 in 1999 (A&E Dept. Report 1999). More than fifty percent of these cases are classified as extrinsic or allergic asthma (Roach and Vanterpool 1995).

In March 2000, the University of the West Indies (UWI), Cave Hill Campus, acquired a Rotorod sampler from Multidata Technologies Inc. With this equipment we sought to

1. characterize pollen and fungal spores in the air over Barbados
2. produce pollen and spore counts and to release such to the media as a public service
3. establish a relationship if any between pollen counts, spore counts and Asthma.

This study is still ongoing.



References

Garty BZ, Kosman E, Ganor E Berger V, et. al. (1998) Emergency room visits of asthmatic children, relation to air; pollution, weather and airborne allergens. Annals Of Allergy Asthma and Immunology 1998;**81**: 563-570

Lewis WH, Vinay P, Zenger VE (1983) Airborne and Allergenic Pollen of North America. The John Hopkins University Press, Baltimore, Maryland

Roach T, Vanterpool JA (1996) Allergy and Asthma. Therapeutic update 1&2: 95-107