The spatial epidemiology of asthma: a chronic non-communicable disease and neglected epidemic

Mungrue Kameel

Faculty of Medical Sciences, The University of the West Indies, Trinidad and Tobago

E-mail: kameel.mungrue@sta.uwi.edu

Abstract

The objective of this study was to measure the appearance of acute exacerbations of asthma in an emergency health center for the period 2010-12, and to describe its spatial distribution using ARC GIS 10.0 (ESRI). The study design is an observational cross-sectional study in which cases of acute exacerbations of asthma treated in an emergency department of a 24-hour semi-rural health center were reviewed. Each patient's address was geocoded and mapped. The occurrence and geographic distribution of asthma that occurs for rescue therapy. The number of cases of acute asthma exacerbations increased in each consecutive year. Spatially, although the geographical distribution of the cases was diffuse, we identified one group (Valencia). Using spatial superposition there was a correlation with temperature and humidity. During the three-year period 2010-2012, there was an increase in the occurrence of acute exacerbations of asthmatics requiring emergency care, emphasizing that asthma remains a major public health challenge. An estimated 300 million people of all ages and ethnic backgrounds live with asthma. This number is expected to increase to 400 million by 2025, increasing the burden of providing care worldwide. In the United States (USA), asthma accounts for 25% of the 2 million visits to emergency rooms.

Asthma also accounts for more than 10 million outpatient visits and 500,000 hospitalizations annually in the United States . In Barbados, between1970-1990, admissions to an acute setting increased from 36 to 360 patients per month despite an increase of only 10% in the island's population during that time. Similarly, for the 1999 one-year period in Trinidad, 5.3% of all adult admissions and 23% of pediatric emergency room admissions were related to asthma. As a result, acute asthma significantly impacts emergency facilities. Therefore, morbidity remains high despite effective treatments. Consensus guidelines consistently highlight the goal and objectives of treatment: (1) eliminate or minimize asthma symptoms, (2) achieve the best possible lung function, and (3) prevent asthma exacerbations, the latter being the primary goal of this study. According to the Global Initiative for Asthma (GINA), asthma is defined as a chronic inflammatory disorder of the airways that results in hyperresponsiveness, bronchial constriction and excessive mucus formation. Clinical diagnosis is based on clinical presentation and research, which may include pulmonary function tests and chest radiography for sputum cell count (total and differential),and fraction of nitric oxide in respiration exhaled. Asthma can be classified according to the age of onset in childhood or adulthood or according to the nature of the severity of symptoms (acute / chronic). Childhood asthma is a complex phenomenon, particularly in distinguishing wheezing episodes caused by a viral infection from asthmatic children in which symptoms are initiated by various triggers including exposure to allergens, exposure to irritants, and exercise.

It is more common than asthma in adults. According to a report by the National Center for Health Statistics in the US In 2002, the prevalence of asthma among children ages 0-17 was 83 per 1,000 compared to adults with a prevalence of 68 per 1000.

There are many reports of an environmental and spatial relationship regarding the incidence of asthma. A review of the literature reveals no studies on the spatial distribution of asthma in Trinidad, therefore this is the first study of its kind in Trinidad and Tobago. The objectives of this study are to measure the occurrence of acute asthma exacerbations in a major health center in the eastern half of the island for the period 2010-12 and, consequently, to describe the spatial distribution of acute asthma exacerbations in the northeast from Trinidad using ArcGIS (ESRI) 10.0.