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ORIGINAL ARTICLE

Acute asthma in emergency department, prevalence of respiratory and non-respiratory symptoms



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KEYWORDS

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Abstract *Background:* Although asthma is a well identified presentation to the emergency department, little is known about the frequency and percentage of respiratory and non-respiratory symptoms in patients with acute asthma in the emergency department (ED).

Objective: The aim of this study is to identify the relationship between acute asthma exacerbation and different respiratory and non-respiratory symptoms including chest pain encountered by patients visiting the emergency department.

Subjects and methods: Prospective study included 169 (97 females and 72 males) asthmatic patients who were admitted to emergency department of two tertiary care facility hospitals for asthma exacerbation from the period of September 2010 to August 2013, an anonymous questionnaire was used to collect symptoms and analysis of symptoms.

Results: 97 (57%) of the patients were females, mean age was 35.6 years; dyspnea on exertion was the commonest symptom accounting for 161 (95.2%) of patients, followed by dyspnea at rest in 155 (91.7%), wheezing in 152 (89.9%), chest pain was present in 82 patients (48.5%), burning pain was experienced in 36 (43.9%) of the total patients with chest pain. Non-respiratory symptoms were seen frequently in acute asthma in ED.

Conclusions: Dyspnea was the commonest chest symptom encountered in patients with acute asthma followed by wheezing. Chest pain in acute asthma is a common symptom and should be fully studied to exclude misdiagnosis as of cardiac origin; there is a need for a better dissemination of knowledge about this disease association with chest pain. It was also noted that other non-respiratory symptoms are frequently encountered with acute asthma in emergency department.

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Introduction

Asthma is a chronic inflammatory disorder of the airways associated with hyper-responsiveness, reversible airflow limitation, and respiratory symptoms. It is the most common chronic lung disease in both the developed and developing

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countries. Bronchial asthma is a common chronic disease that affects people of all ages. Insufficient asthma control may cause frequent emergency department (ED) visit by patients who seek crisis management of their acute asthma exacerbation [1]. Acute asthma exacerbation is a common medical emergency [2], it represents the 11th most frequent ED diagnosis that is faced by the emergency department and intensive care specialists, a disease entity that must be diagnosed and treated urgently. All patients with asthma are at risk of having exacerbations characterized by a progressive increase in shortness of breath, cough, wheezing or chest tightness [3]. Respiratory symptoms, including breathlessness, wheezing cough and sputum production, are characteristic features of the disease and have significant adverse effects on patient functioning and quality of life. Although spirometric measures are useful for diagnosis and evaluating change in lung function, they do not capture symptom severity or variability; and their weak correlations between lung function and symptoms. A number of circumstances may mimic the diagnosis of Acute Asthma (COPD, congestive heart failure, upper airway obstruction, hyperventilation syndrome, or vocal cord dysfunction), usually, they can be identified by history and physical examination. A brief history pertinent to any exacerbation should be obtained. Morbidity and mortality are most often associated with failure to appreciate the severity of the exacerbation, resulting in inadequate emergency treatment and delay in referring to hospital. The occasional presence of unusual symptoms either respiratory or non-respiratory results in diagnostic confusion.

Although asthma is a well identified presentation to the emergency department, little is known about the percentage of respiratory and non-respiratory symptoms, and search in the literature did not reveal enough data for this entity.

The aim of this study is to identify the relationship between acute asthma exacerbation and different respiratory and non-respiratory symptoms including chest pain encountered by patients visiting the emergency department.

Subjects and methods

A total of 169 consecutive patients (97 females and 72 males) who were confirmed before as asthmatics, or first presentation of asthma exacerbation, who were admitted to the emergency department for asthma exacerbation are enrolled in this prospective study.

Patients were eligible for the study if they met all the following criteria: (1) age ≥ 18 years old; (2) has any, or all, of the following clinical features as defined by the Global Initiative for National Asthma (GINA) Guidelines [4]: dyspnea, wheeze, acute cough, increased work of breathing, increased requirement for beta2-agonist from baseline use, O_2 saturation $< 95\%$, a peak expiratory flow (PEF) at presentation to the emergency department $\leq 80\%$ of their known best (within the last 12 months) or, in the absence of this information, of their predicted PEF. Patients readmitted were not studied a second time. Exclusion criteria included patients below 18 years, patients with fever, CXR shadows suggestive of infection or other identified etiological cause for pulmonary symptoms, pneumothorax, pleural effusion, positive EKG findings or positive cardiac enzymes, cases with evidence of pulmonary embolism, and patients with chest trauma, patients with

COPD anemia renal impairment, congestive heart failure or any identified disease causing dyspnea were also excluded from the study.

All patients were subjected to thorough history taking including smoking history and medication usage, cardinal chest symptoms (dyspnea wheezing cough sputum production and hemoptysis), prevalence and duration of symptoms, and possible exacerbating factors or certain exposures, associated disorders diagnosed before as allergic rhinitis gastroesophageal reflux eczema or allergic bronchopulmonary aspergillosis were asked about. Comorbid conditions were also recorded. Prior medications used before ER visits were recorded. Clinical examination and assessment of vital signs including oxygen saturation at presentation, PEF measurement with reference to previous or best PEF if available or percentage of predicted are recorded, patients were categorized as mild (PEFR above 70%), moderate (between 40% and 69%), and severe (if below 40%) according to the recommendations of Expert Panel Report 3 (EPR-3) (2007) [5] whenever applicable as there are patients with extreme illness cannot perform, CXR and EKG, and in patients with chest pain cardiac enzyme analysis D dimer and where uncertain, echocardiography was performed. The outcome after ER visit was mentioned in the questionnaire.

The authors in collaboration with emergency department developed an anonymous questionnaire, each patient was given this questionnaire on encountered respiratory symptoms including chest pain and non-respiratory symptoms associated with their asthma attack, chest pain was analyzed by its quality or nature, location, reference and severity, after this questionnaire had been completed the answers were discussed with the emergency department physician. Patients complaining from chest pain with normal EKG and normal cardiac enzymes were referred to cardiology and subjected to stress echocardiography and enrolled in the study only if the stress echocardiography was normal. Data were collected and analyzed and descriptive statistics were calculated. All the analyses were performed including all symptoms using SPSS release 17.0 (SPSS Inc., Chicago, IL, USA). For its analysis, symptoms were computed without excluding missing answers, which were therefore counted as negative or "no symptoms".

Results

In this study the questionnaire was administered to the enrolled patients (169 patients) after exclusion of 15 patients with chest pain of other cause rather than asthma and 4 patients with positive stress echocardiography, a description of the studied sample of subjects is given in Table 1.

Demographic data of acute asthma in emergency department

97 (57%) of the patients were females. Newly diagnosed asthmatics were 54 (32%), Smoking habit in this study was categorized as current smokers, ex-smokers and never smokers, where the current smokers were the ones that who have smoked greater than 100 cigarettes in their lifetime and reported having smoked during the last month in the presentation, ex-smokers who have smoked greater than 100 cigarettes in their lifetime and do not currently smoke and never smokers who smoked less than 100 cigarettes in their whole life.

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