



Original Article

A Clinical Audit of Patients Suffering from an Acute Attack of Asthma Attending Emergency Department at Al-Nafees Medical College and Hospital Islamabad

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ABSTRACT

Asthma has been considered historically a major chronic illness faced by human beings with recurrent attacks of breathlessness and expiratory wheezes especially in children and an old ages. **Objective:** To determine the pattern of patients suffering from an acute attack of asthma and being managed by the emergency departments. **Methods:** A prospective study conducted at Al-Nafees Medical College and hospital in emergency department on patients suffering from an acute attack of Asthma from May 2022 to September 2022. 300 patients were selected through convenience sampling and followed for three steps management. **Results:** On arrival 250 patients received PEFR with 162 measured before bronchodilation, 285 had oxygen saturation greater than 92%, 264 were assessed for SaO₂ on room air, 255 responded well with a SaO₂ overcrossing 92%. PEFR was measured after nebulization in 168 patients while both pre and post PEFR assessment was done in 27.3 % patients Seventy eight received β₂agonists by nebulizer. Intravenous theophylline was given to 52 patients, while corticosteroids were given to 44 patients as an initial treatment, 35 patients received IV fluids as a 1st line of management for an acute attack. Mechanical ventilation was used in 2 cases only. Supplemental oxygen was given to 14 without SpO₂ while with SpO₂ in 12 cases. Antibiotics were used in 16 cases and mucolytic in 6 only. IV corticosteroids were given in 14 cases and anxiolytics in only 4 cases. **Conclusions:** Overall emergency services at Al-Nafees medical college and hospital for patients' management with acute asthmatic attack were satisfactory.

INTRODUCTION

Asthma has been considered historically a major chronic illness faced by human beings with recurrent attacks of breathlessness and expiratory wheezes especially in children and an old ages. It is prevalent in most of the parts of the world [1]. This medical emergency face underdiagnoses and under treatment in various part of the world. In a report shared by "(PAHO)" in 1999 reported that, respiratory illnesses account more than 12% of all medical emergencies to be visited by the emergency department (ED) especially an acute attack of asthma [2]. In various parts of the world an acute attack are managed

haphazardly at various hospitals and especially the situation is more horrible and pathetic in under developed countries like south Asian countries, African countries [3]. Asthma involves the mast cells, lymphocytes, macrophages and inflammatory mediators especially for the emergence of clinical sign and symptoms of an acute attack in all of the patients [4]. These symptoms result in airflow obstruction, chest tightness and coughing particularly at night or in the early hours of the morning [5]. Globally almost 300 million people of all ages suffer from an acute attack of asthma regardless of ethnic and genetic

supposition or predisposition [6]. Advances in science has led to the development of advance techniques and erasing of agony faced by asthmatic patients in dire situations [7]. Guidelines given by Global Initiatives for asthma (GINA) and British guidelines on asthma management are practiced widely for managing an acute attack of asthma in an emergency department widely over the large part of the world [8]. American National Asthma Education and prevention program (NAEPP) protocols are widely used all over the world for management of an acute attack of asthma [9]. Assessment of the quality of asthma management is imperative in developing countries [10]. This clinical audit has been especially designed to see the application of standard protocols implemented in the emergency department for management of an acute attack of asthma and the deficiency marked to improve the status of the management standards for an acute attack of asthma at Al-Nafees medical college and hospital Islamabad.

METHODS

A prospective audit was done in the emergency department of the Al-Nafees medical college and hospital Islamabad investigating the sufferers of an acute attack of asthma seeking emergency medical care at an emergency department of the Al-Nafees medical college and hospital Islamabad between 1st May 2022 to 1st September 2022. Patients included in this an audit consist of 2 years of a child to an age to 83 years of an old one. Convenience sampling was used for subjects selection as this study is based on emergency seeking patients for management of an acute of asthma. British Adult asthma audit tool was used for reference to conduct this study. It assessed three stage criteria to assess, to manage and to discharge cases suffering from an acute attack of asthma. Peak expiratory flow rate (PEFR) was applied in an initial step, PEFR defined as "the maximal rate that a person can exhale during a short maximal expiratory effort after a full inspiration". Data were coded and SPSS 24 was used for statistical analysis. Fisher exact test and bivariate analysis was used for categorical variables. Student's t-tests used for analysis of age and PEFR analysis. Ethical approval was taken prior to conduction of study from Research and ethical board committee Al-Nafees medical college and hospital Islamabad. This audit followed the three steps management protocol practiced at Al-Nafees medical college and hospital for the management of an acute attack of asthma.

1. Initial Phase of assessment

- a. Use of standard Peak expiratory flow rate
- b. oxygen saturation use

2. 1st step of management

- a. Intravenous corticosteroid use
- b. Nebulizer use

3. Instructions at discharge of the patients

RESULTS

Three hundred patients with acute asthmatic patients were admitted in an emergency department of the Al-Nafees medical college and hospital Islamabad during the period May 1 to September 01, 2022. Some of the patients had a multiple visits with the records of 300 patients showing different demographic presentations. Age and gender distribution show that there were 61.7% male and 38.3% were female patients in the study. Among the 300 patients, ages ranged from 2 to 83 years with mean of 38 years. In the 1st phase of the assessment status of the asthmatics patients was studied through records to conduct initial assessment. Majority of the patients were new and had visited the hospital for the 1st time, 60.66% cases had no previous visit for an acute asthmatic attack in the hospital. Eighty-five of 300 patients reported for never coming to hospital for acute attack of asthma or it has passed more than a year to visit any hospital for the asthma attack. Table 1 shows the frequency of the patients with status asthmatics visited to the Al-Nafees medical complex Islamabad in the emergency department for seeking emergency care an acute asthma attack. Table shows that majority of the patients visiting during study period were visiting 1st time and their DATA was not available before.

Last visit Month	Frequency (%)
Less than a month	45 (16%)
1-4 months	34 (11.3%)
5-12 months	67 (22.33%)
>12 months/Never	34 (11.3%)
Data not available	112 (37.33%)

Table 1: Frequency distribution of visiting patients at Al-Nafees medical college and hospital Islamabad for management of Status asthmatics.

Of the 250 out of 300 patients who had received PEFR on arrival, only 162 were measured before bronchodilation, and of these, only 84 had the expected PEFR recorded. Two hundred and eighty five of the total patients admitted to emergency department had been recorded with an oxygen saturation measuring greater than 92%, however, 264 patients oxygen saturation (SaO₂) was performed on room air; the other thirty six patients were recorded for oxygen saturation while on oxygen. Out of total 264 patients who were assessed for SaO₂ on room air, 255 responded well with a SaO₂ overcrossing 92%. In total, an arterial blood gas was performed on 12 patients (Figure 1).

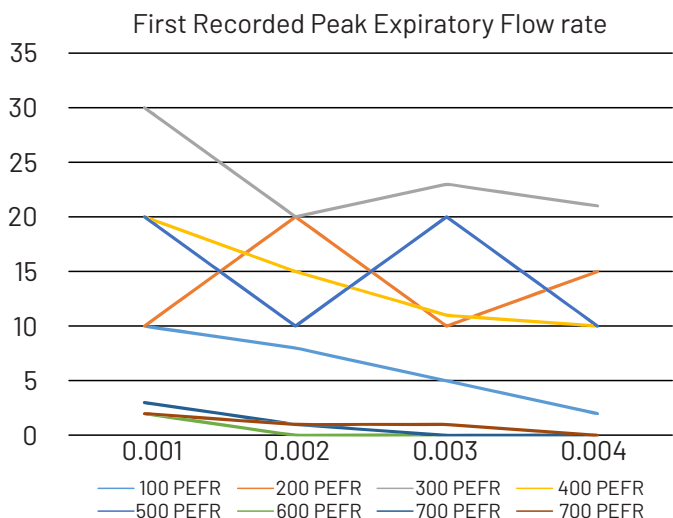


Figure 1: Graphical display of the distribution of the first recorded PEFR

On 1st assessment upon arrival of the patients, 91 patients were marked to have acute asthma attack and preliminary assessment labelled them as either mild, moderate or very severe. 25 patients were transfused intravenous corticosteroids upon 1st arrival at the emergency unit. Three to four nebulization were advised for every fifteen to twenty minutes for the first hour for all the patients, however, only 15 patients were administered the nebulization in this time frame. Physicians prescribed intravenous Ipratropium bromide with the nebulization in 282/300 (94%) of the cases, however, it was observed properly (one dose per set of three nebulization of salbutamol) in few cases only. Most of the patients were reassessed almost two to three hours post-nebulization and some patients lack recorded times for reassessment (Figure 2).

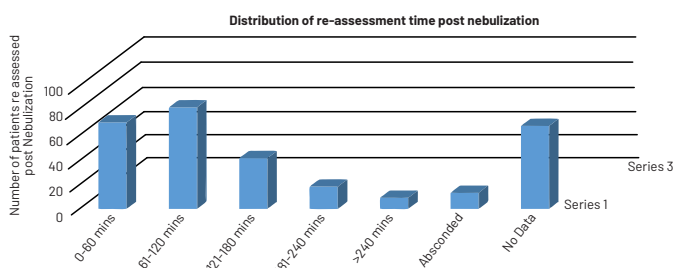


Figure 2: Re-assessment time post nebulization

Out of 300 total patients, 168 patients had been recorded a PEFR after a proper set of nebulization. A total of 83 patients observed both pre and post PEFR assessment. Out of the total 300 patients, 18 and 5 patients received inoculation of magnesium sulphate (MgSO₄) and aminophylline infusion respectively during study period of four months. In this study majority of the patients had been

treated for status asthmatic attacks, 86 % after initial treatment were discharged from the emergency department. Nineteen patients had been referred for admission for further treatment to the general medical wards (Figure 3). During the study time mortality was not recorded in any case nor was any patient admitted in the intensive care unit (ICU). Out of total 300 admitted patients to emergency department, 167 patients had been put on inhaled corticosteroids in previous visits at this hospital or elsewhere in emergency unit. Ninety-five per cent of them had been prescribed an inhaled corticosteroids which were continued post-discharge. In addition, 83/300 (27.3%) patients had been remedied on oral corticosteroids post-discharge also.

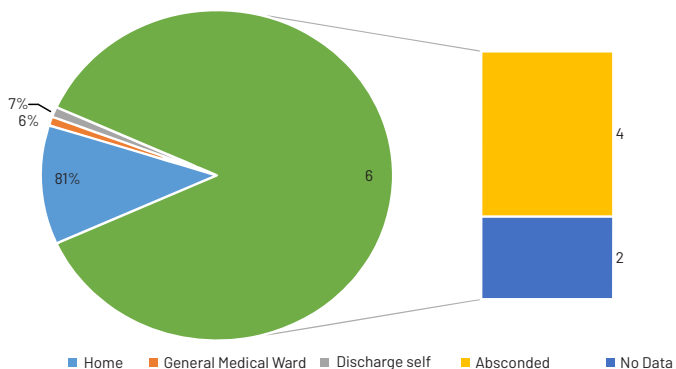


Figure 3: Discharge/shift status of the patients to various places from emergency department

Inhaler techniques played a key role in management of acute asthma Inhaler techniques were checked in only 3% of patients, while 1% was health educated by an action plan to manage an acute attack of asthma at home. Eighteen per cent were advised to observe follow-up for 24 hours post-discharge. Figure 4 shows the distribution of various treatment options given at 1st visit of the patient in emergency department. Mostly patients were received β 2 agonists by nebulizer as an initial remedy Intravenous theophylline was given to 52 patients, while corticosteroids to 44 patients as an initial treatment IV fluids were the 1st line of management in 35 patients. While only in 2 cases mechanical ventilation was the 1st choice of the physicians in an emergency room t. Supplemental oxygen was given in 14 cases without SpO₂ while with SpO₂ in 12 cases. Antibiotics were the 1st line of therapy in 16 cases and mucolytic in 6 patients in management of acute attack of asthma. IV corticosteroids were given in 14 cases and anxiolytics in only 4 cases.

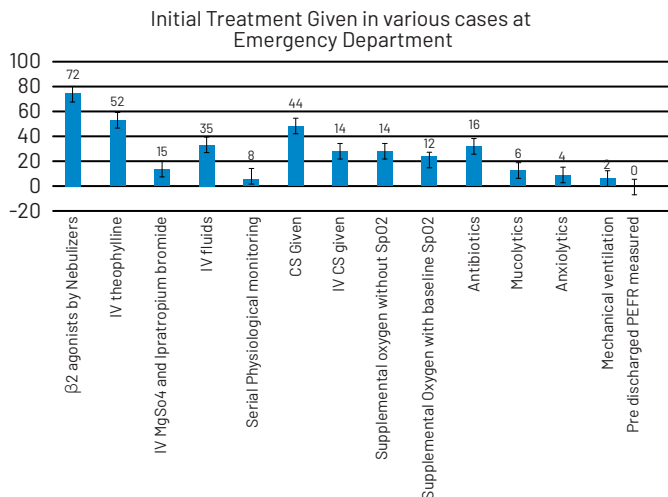


Figure 4: Initial treatment given for acute attack of Asthma in Emergency department

DISCUSSION

Asthma prevalence is much marked in girls in early childhood, however at puberty this shift tends towards girls predominantly. Majority of the kids were male rather females in emergency rooms of various tertiary care hospitals. British Guidelines for management of asthma reveal that repeated admission for acute attack of asthma usually culminate at fatal end and come with serious complications. (UK /BTS sign) [11]. A study conducted by Graham et al., reveal that clinical signs and symptoms have poor correlation with the severity and outcome of the acute attack of asthma [12]. Children with an acute attack of asthma may exhibit different outcome with the acute severe attack of the asthma. Severity, variability and reversibility of acute asthmatic attack largely depend on a measurement of lung function accurately [10, 13]. PEF measurements can't be used in children under 5 years of age accurately due to lack of compliance by the children at this age. at this age initial pulse rate is considered important according to UK BTS/SIGN asthma guidelines.

Ibrahim et al., enforced the use of the $\beta 2$ agonists as the first line treatment for an acute of asthma. Pressurized Metered-Dose inhalers (pMDI) with spacers has been considered as the effective alternative to use of nebulizers [14]. Acute care is mostly given by junior staff at hospital, which is much different from care given by respiratory physicians, as trained individuals follow the strict guidelines and policies. Many patients with acute asthma are monitored by chest physicians and they tend to recover more quickly [15, 16]. Some of the clinical practices for acute asthma management has been found outside the standard protocols which may nevertheless was incorrect and deliver fruitless results [17]. Muzamil et al., found in a retrospective study conducted at asthma management in

the emergency department found that corticosteroid use helps in identification of higher risk patients [18]. Conversely clinical impression is deceivable and notorious in terms of risk estimation. Objective measurements are more reliable in terms of patients status for flow of rate measurements. Lung functions tests are more important along with tests to monitor the response of the treatment in patients [19] and it is consistent with the findings by the studies Fitzgerald et al., [20]. Asthma has been found on the top to be practiced by the physicians in the emergency room so standard protocols must be followed and high class training is must require by the hospital to all the emergency staff along with the deployment of chest physician in the emergency room. It has been found in a study conducted by smith et al that Positive End Expiratory Pressure (PEEP) should be in limit form and must not exceed intrinsic PEEP and ongoing clinical assessment for the gas trapping presence while FRC magnitudes are compulsory. Inspired gas adequate humidification is especially important in the ventilated asthmatic persons for the prevention of mucosal drying and further thickening of secretions that might be responsible for stimulation of further bronchospasm [21]. It augments that mechanical ventilation might be responsible for compromise of delivery of aerosolized bronchodilators [8]. A clinical audit conducted by Farion et al., describes that the acute asthmatic attack management are usually suboptimal and there is always a low level of compliance with the most recommended GINA guideline. This audit further emphasized the need to address the nonperforming areas especially knowledge gaps, clinical competence, and most importantly organizational issues [22].

CONCLUSIONS

Acute asthmatic attack management is the emergency response by any standard hospital, so each hospital emergency department should be equipped with all necessities including trained staff and pulmonologist facility on call as well, it has been practiced at Al-Nafees Medical CollegE and hospital more effectively.

Conflicts of Interest

The authors declare no conflict of interest.

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