

Approach and Management of Acute Bronchial Asthma Exacerbation at Aswan University Hospital

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Abstract:

Asthma is a respiratory disease characterized by recurrent episodes of dyspnea, cough, and wheeze caused by reversible airways obstruction. Histological examination of the airway tissue in an asthmatic lung shows the presence of an inflammatory reaction, with extensive remodeling of the airway wall. The inflammation is a multicellular process; even in the mildest of asthmatic individuals there is in vivo evidence of infiltration of the bronchial mucosa with mast cells, mononuclear cells, and granulocytes, of which the eosinophil is prominent

Key words: immunosuppression ; cancer immunotherapy; myeloid-derived suppressor cells (MDSC) ; cancer cachexia; immunosuppressive cells

Introduction

Asthma is a respiratory disease characterized by recurrent episodes of dyspnea, cough, and wheeze caused by reversible airways obstruction. [1] Histological examination of the airway tissue in an asthmatic lung shows the presence of an inflammatory reaction, with extensive remodeling of the airway wall. The inflammation is a multicellular process; even in the mildest of asthmatic individuals there is in vivo evidence of infiltration of the bronchial mucosa with mast cells, mononuclear cells, and granulocytes, of which the eosinophil is prominent. [2] The tenacious plugs that fill the lumen are an exudate of plasma and inflammatory cells, particularly eosinophils, which have migrated into the lumen, as well as epithelial cells that have sloughed from the airway surface, often leaving the basement membrane denuded. The basement membrane appears thickened when viewed under the light microscope, which is due to an increase in the amount of collagen deposition at this site, but the lamina densa, which forms the true basement membrane, is normal when observed with the electron microscope. [3] The changes in the lumen and wall of the airways of asthmatic lungs are reflected in the cytological examination of sputum from patients with the disease. There is a clear increase in wall thickness throughout the bronchial tree in patients with asthma, and all the tissue layers participate in this generalized increase in airway wall thickness. [4] Asthma exacerbations are episodes of progressively worsening airway narrowing, associated with increasing shortness of breath, cough, wheezing, chest tightness, or some combination of these. [5] Exacerbations can vary in severity from episodes which patients are able to manage themselves by following an agreed treatment plan, to severe and potentially life-threatening episodes that require medical attention and hospital admission. Severe attacks also

vary in their speed of onset, ranging from deterioration over days to episodes that progress rapidly and can become life-threatening within minutes or hours.[6] The aims of the treatment of acute severe asthma are to reverse the hypoxia, airflow limitation, and airway inflammation with oxygen, bronchodilators, and corticosteroids.

Aim

By conducting this clinical audit, we aim to enhance the overall quality of hospital care for patients with acute asthma, promote adherence to best practices, and improve patient outcomes.

Standard

The initial assessment criteria in all patients with acute asthma exacerbation are respiratory rate, heart rate, oxygen saturation, peak expiratory flow rate (PEFR), severity of exacerbation, and identified potential trigger. The standard was set to be 100% for each criterion. Based on GINA guidelines, the treatment criteria for all patients with acute asthma exacerbation are administration of short acting beta agonist "SABA" as needed based on the severity and weight, administration of inhaled corticosteroids (ICS) at appropriate dose based on severity and weight, administration of oxygen therapy if the saturation below 90% or in evidence of respiratory distress, administration of additional therapies (like magnesium sulfate, and nebulized heliox) in case of worsening asthma, mechanical ventilation and intensive care unit (ICU) admissions in severe cases. The standard was set to be 100% for each criterion.

Regarding monitoring and evaluation criteria in all patients with acute asthma exacerbation, they are vital signs monitored regularly (every 30 minutes or as needed), response to treatment assessed regularly (every 30 minutes or as needed), treatment plan adjusted based on treatment response, and patient education about self-management and inhalers techniques. The standard was set to be 100% for each criterion.

Methodology

Regarding the first cycle, a retrospective study was done. The sample size was 40 staff members (doctors) who approached and managed patients

with bronchial asthma exacerbations in chest emergency department and different departments. The sampling technique was total sampling so no one was excluded. Data were collected by a self-administrated questionnaire to evaluate staff awareness and adherence to management protocols (GINA guidelines), and analyzed by SPSS version 27.0. and Excel sheet.

Results

The percentage of medical staff in chest emergency department from the hospital departments was 80% [figure-1].

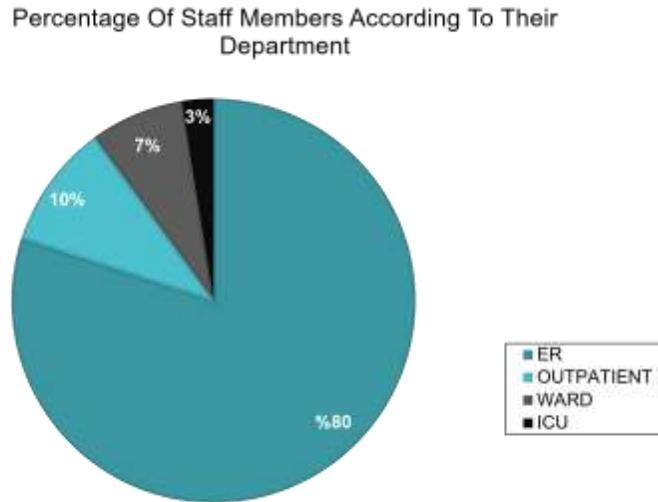


Figure-1

The majority of them with 6 – 9 months experience in chest emergencies [figure-2]. Regarding the initial assessment data, the results were 87%, 87%, 97%, 17%, 56%, and 97% for respiratory rate, heart rate, oxygen saturation, peak expiratory flow rate (PEFR), severity of exacerbation, and identification of the trigger from history, respectively.

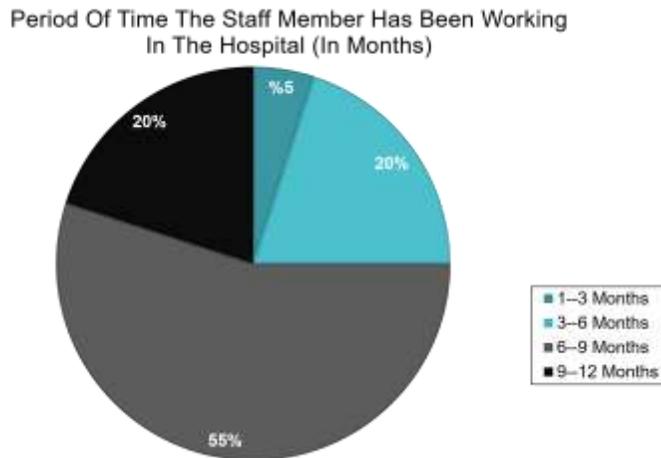


Figure-2

In terms of treatment administration and monitoring and evaluation, the data are presented in the tables [table-1] and [table-2].

Criteria	Standard	First cycle standard
Administration of Short-acting Beta Agonist (SABA) as needed based on severity and weight	100%	85%
Administration of Inhaled Corticosteroids (ICS) at appropriate dose based on severity and weight	100%	87%
Administration of Short-acting Anticholinergic (Ipratropium Bromide) according to appropriate dose.	100%	55%
Administration of Systemic Corticosteroids (Oral, IV) according to weight	100%	72%
Administration of Oxygen Therapy if saturation is below 90%, or in evidence of respiratory distress	100%	46%

Administration of additional therapies (e.g. Magnesium Sulphate, Nebulized Heliox) in case of worsening asthma	100%	85%
Mechanical Ventilation and ICU admissions in severe cases.	100%	95%

Table 1: Treatment criteria for all patients with acute asthma exacerbation

Criteria	Standard	First cycle standard
Vital signs monitored regularly (every 30 minutes or as needed)	100%	25%
Response to treatment assessed regularly (every 30 minutes or as needed)	100%	92%
Patient education about self-management and inhalers techniques	100%	72%
Personalized discharge plans initiated prior to discharge	100%	87%
Follow-up appointment scheduled after discharge	100%	62%

Table 2: Monitoring and evaluation criteria in all patients with acute asthma exacerbation 67% of doctors believe the hospital's protocol of asthma exacerbation management is effective. So agreed changes were implemented for the staff and system, which were.

Training sessions in asthma exacerbation management.

Cognitive scheme to remember items of management.

To make sure the prescription is written in clear and informative way.

Continuous monitoring of each patient condition until its safely managed.

Develop patient centered discharge plan with clear instructions on medication use and follow up.

Asthma classification and management posters.

Asthma approach and management assessment checklist paper for each patient.

Provide sufficient drugs and equipment for rapid interference and management like peak expiratory flow rate meter device.

Recommendation And Quality Improvement Plan

The improvement strategies suggested by staff members to enhance management of asthma exacerbation were implement a standardized triage system to identify patients at risk rapidly, provide adequate drugs and equipment for rapid interference and management, implementation of

od regular training programs for the staff, and developing patient-centered discharge plans with clear instructions on medication use and follow up.

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