The Compliance to Acute Asthma Management Protocols in Paediatric Emergency Department

Abstract:

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Asthma guidelines should be followed closely to ensure improvement and consistency of outcome. In order to measure compliance with local acute asthma protocols, we reviewed notes of children presenting to our ED with acute asthma. We noted clinical assessment of severity of asthma exacerbation, compared management of cases with local protocols, noted time to first nebulisation, discharge advice and follow up plans. Retrospectively, 6 patients had life-threatening, 70 had severe and 64 had mild-to-moderate exacerbation. We observed inconsistent documentation of clinical signs in 44% (respiratory rate >40/min(<5 years) and >30/min(>5 years)), mental status: normal in 66.6%, and speech: single word in 36.4%. Life threatening exacerbations were defined as; Normal mental status, single word speech, marked accessory muscle, SaO2 between 90-92%, heart rate of >130/min(<5 years) and >120/min(>5 years), respiratory rate of >40/min(<5 years) and >30/min(>5 years). Life threatening episode was defined as; altered mental status, inability to talk, silent chest and SaO2 less than 90.

According to the protocol, patients were designated and treated on the basis of the most severe feature. In the study, assessment of severity and management treatment of acute asthma exacerbation was based on self reported data obtained by interviews or questionnaires.4,12 Most of the clinicians are aware of these guidelines but there are potential barriers described in these studies.3,12,13 We wished to investigate how adherent clinicians were in complying with local asthma management protocols in Paediatric Emergency Department (ED) of Tallaght Hospital. Our study was based on data from medcal notes documented by emergency department clinicians. The objective was to measure the compliance with local acute asthma management protocols in Paediatric ED setting of a tertiary referral centre.

Methods

Patients presenting with signs and symptoms of acute asthma during a three month period from January through March 2011 were selected and their medical records were retrospectively audited in the ED. Documentation of clinical findings, such as, respiratory effort, speech ability, mental status, oxygen saturation, heart rate and respiratory rate were noted to assess the severity of asthma exacerbation. Patients were retrospectively assigned to the following three categories: mild-to-moderate, severe, and life threatening by the investigators according to the documented signs. These categories were defined in the local hospital protocol. Mild to moderate category was defined as: Normal mental status, single word speech, marked accessory muscle use and oxygen-saturation(SaO2) >92%, Severe exacerbation was defined as: Normal mental status, single word speech, marked accessory muscle use, SaO2 between 90-92%, heart rate of >130/min(<5 years) and >120/min(>5 years), respiratory rate of >40/min(<5 years) and >30/min(>5 years), life threatening episode was defined as: altered mental status, inability to talk, silent chest and SaO2 less than 90.

Results

During the audit period, 140 patients attended our ED with acute asthma exacerbation. Age of children ranged between 1 to 19 years with the median age of 5 years - 3.5years. Out of 140 cases, 112 patients (80%) were known to be asthmatic.

Asthma is a chronic inflammatory disease of the airways characterized by variable recurring symptoms, reversible airflow obstruction, and bronchospasm.1,2,3,7,8,9 Ireland has the 4th highest prevalence of asthma worldwide. There are approximately 5,000 asthma-related hospital admissions per year, of which 44% are young patients aged less than 15 years.1,5 Annual Emergency Department visits are four times this figure.2,6 Being a common condition, there should be a unified approach and education of medical care providers towards the management of this condition. Inadequate therapy with the selection of inappropriate medicines is among the failings in asthma management.7 Various national and international guidelines have been developed about asthma management.8-10 Local protocols have been adopted in different institutions which draw on these broader guidelines.

In a prospective cohort study, assessment based upon clinical features alone has been shown to be equal to PEFR evaluation in discriminating severe cases requiring hospital admission.11 Information about the severity is assessed, prompt initiation of bronchodilator therapy is the mainstay of treatment.12,13 Inadequate therapy of acute attacks

Introduction

Clinical Features and Severity

Based on above documented clinical signs, the retrospective severity of asthma exacerbation was: mild-to-moderate exacerbation in 64 (45.7%), severe exacerbation in 70 (50%), and life threatening exacerbation in 6 (4.3%) cases. During their assessment of severity, vital signs were uniformly recorded in all children by nursing staff. Respiratory effort was documented in all patients with a life threatening exacerbation. In the severe group, it was not recorded in 11% of patients. Also, 5% of patients who were considered as severe exacerbations had no respiratory distress according to clinical assessment (Table 1 and 2).

In life threatening exacerbations, mental status and speech were not documented in 50% and 83.3% of cases respectively. In patients presenting with severe signs, these parameters were lacking in 34.3% and 72.6% of the cases respectively. Despite the relatively poor recording of clinical signs, there was 100% correlation between our recorded severity and the severity documented in the medical notes of patients. In the mild-to-moderate group, over 50% were treated as severe despite only having signs consistent with a milder asthma exacerbation. Fifty percent of life threatening cases received first nebulisation immediately after the triage while the remaining half received it in this time interval. Ten percent of severe cases had first bronchodilator within 10 minutes of triage and nearly two thirds were managed within 60 minutes while average time interval in this group was 54 minutes.

All of the life threatening cases were admitted / transferred to another hospital. Ninety percent of mild to moderate cases were discharged after acute management. Only one patient re-attended the emergency department within one week of last presentation. Fifty four percent of the discharged patients had discharge advice documented.
Accessory muscle use correlated most closely with oxygen-saturation followed by dyspnoea and respiratory rate. In regards to treatment, an important observation was the delay in initiation of bronchodilators in life threatening and severe cases. Prompt bronchodilator therapy is the mainstay of acute asthma treatment while delay can have disastrous outcome of asthma attack. To avoid such delay, it is an attempt to expedite the treatment. Studies have been done to show comparable result of spacer device versus nebulizer in instituting prompt therapy and relief8,15. It is important to mention here, the approach of treatment for acute asthma of childhood. Pediatrics. 1991 Apr;87:481-6.

Our study demonstrated varying degree of adherence to local asthma protocol by clinicians. In ED, initial triage assessment plays an essential role in raising concern about the severity of any condition. In this study, vital signs were uniformly recorded in all children at triage. The importance of use of accessory muscle as an indicator of respiratory distress is established for decades. A prospective study by Kerem et al showed that of all clinical findings the degree of accessory muscle use correlated most closely with lung function. Similarly, the degree of respiratory distress is established for decades. A prospective study by Kerem et al showed that of all clinical findings the degree of accessory muscle use correlated most closely with lung function.

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Furthermore, mental status and speech are important non respiratory features of severity of exacerbation and any deterioration in these should alert clinicians to prepare for potential respiratory failure. Consequently we would stress the significance of each clinical feature as asthma is a multidimensional clinical entity and no single parameter can reliably reflect the full picture of exacerbation. The study emphasizes the importance of guideline concordance for clinicians. It highlights areas where additional work is required. These include documentation of clinical findings to correctly categorize the severity of acute attack, selection of right arm of algorithm for appropriate treatment, prompt initiation of bronchodilators, in life threatening (immediately) and severe cases (within 10 minutes) after triage. We recommend continuing the follow-up plan in conjunction with the data and statements placed on the importance of recording clinical signs and appropriate treatment. We have also introduced the written action plan for discharge. This will standardise our care and facilitate regular audits for this common condition.

All life threatening and most severe cases were admitted for extended management and monitoring. Re-attendance of only one patient among severe cases after acute exacerbation by primary physicians or asthma nurse within two working days and medical OPD within a month. There was no asthma action plans given to patients. The significance of written action plan is clearly emphasized in a study by Turpie et al. in which patients with severe asthma had a lower hospital admission and prompt treatment in case of exacerbation and reduction in hospital visits to ED. Being a busy department, unavailability of written action plan in ED is a possible reason for clinicians not to be provided with adequate discharge advice to patients.

The study emphasizes the importance of guideline concordance for clinicians. It highlights areas where additional work is required. These include documentation of clinical findings to correctly categorize the severity of acute attack, selection of right arm of algorithm for appropriate treatment, prompt initiation of bronchodilators, in life threatening (immediately) and severe cases (within 10 minutes) after triage. We recommend continuing the follow-up plan in conjunction with the data and statements placed on the importance of recording clinical signs and appropriate treatment. We have also introduced the written action plan for discharge. This will standardise our care and facilitate regular audits for this common condition.

References

2. NLHBI Guideline 2007, pp. 1112


