Implementation of the National Asthma Management Guidelines in the Emergency Department

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ABSTRACT

Objective: The national protocol for asthma management was released in 1995. There has been no national investigation to compare the actual care delivered at the Emergency Department to those recommended by these guidelines: To compare the documented management of acute bronchial asthma at the Emergency Room (ER) with the Saudi National Guidelines

Methods: Retrospective analyses of a total of 150 ER records, of patients with a diagnosis of asthma over a one year period (January through to December 2000), at King Abdul-Aziz Medical City, King Fahad National Guard Hospital, Riyadh, Kingdom of Saudi Arabia. Documentation of the history, indices of severity, treatment given, pre-discharge assessment and prescriptions were compared to the nationally recommended management.

Results: History of the present attack, its duration, frequency of β-agonist use and nocturnal symptoms were documented in less than 50% of patients. Previous ER visits and hospitalization, peak flow rate and accessory muscle use were similarly recorded in less than 50% of patients whereas intensive care unit admission and intubation were documented in less than 15% of asthmatics. Steroids were given to only 46% of patients with acute asthma who visited the Emergency Department. Pre-discharge clinical assessment and peak flow readings were documented in 48% and 29%. Only 64% of patients were given a follow up appointment.

Conclusion: The documented treatment of patients with an acute asthmatic episode at the ER varies significantly from what is recommended by the National and International Asthma Management Guidelines. Failure to implement Asthma Guidelines probably results in an inadequate care of asthmatic patients and raises the urgent need for a National Physician Asthma Education Program.

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Worldwide increased prevalence and associated significant morbidity and mortality from bronchial asthma have led to the development of national and international guidelines on asthma management.[1-8] Many studies have highlighted deficiencies in the actual implementation of such guidelines in clinical practice.[9-13] At the Emergency Room (ER), such deficiencies in management include inadequate objective assessment of asthma severity, failure to provide adequate treatment, failure to objectively assess response to such treatment and inadequate arrangements for follow

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up. Review of the literature found no studies in the Kingdom of Saudi Arabia (KSA) addressing this issue or directly comparing the actual emergency care of acute asthma to published national or international guidelines. The Saudi National Acute Asthma Management Guidelines have been published in 1995 and in general, follow internationally accepted principles for asthma care. The aim of this study was to examine the implementations of the National Guidelines of Asthma Management at the Emergency Department at King Fahad National Guard Hospital (KFNGH) in Riyadh, KSA. King Fahad National Guard Hospital is one of the largest tertiary care hospitals in KSA, with a capacity exceeding 600 beds. The ER at KFNGH is one of the most modern state of the art departments in Riyadh with a comprehensive ER consultant-led service supplanted by a team of trainees, residents, fellows and staff physicians.

Methods. A retrospective analysis of charts of patients seen with acute exacerbations of asthma in the Emergency Department over a one year period (January through to December 2000). Offered interventions were compared to the nationally recommended management guidelines. The following information were specifically sought: 1. Demographic data (age, gender), 2. History of current asthmatic attack and its duration, 3. History of previous ER visits, hospitalization or intensive care admission or intubation, 4. Indices of severity (vital signs, pulse oximetry, peak expiratory flow rate), 5. Immediately prescribed medications, 6. Objectively documented parameters of response to offered treatment and 7. Prescribed take home medications and follow up arrangements. Due to the difficulties children may have in peak expiratory flow charting, this measurement was not substantiated when examining charts of those less than 12-years of age. To avoid seasonal, resident training or variable shift bias a maximum of randomly selected 15 charts per month were reviewed. Patients with any additional diagnosis to bronchial asthma were excluded.

Results. Total charts reviewed were 150. Eighty-five were male (57%). Mean age was 29-years, and age ranged between 3-79-years. Fifty-six patients (37%) were aged less than 12-years-old. Only 10 patients required admission (6.7%). History of nocturnal symptoms, details of the current asthmatic episode, its duration, and prior use of βeta-2 agonist were documented in 40, 49, and 48% of patients (**Table 1**). Histories of previous hospitalization, intensive care admission, intubation, or regular outpatient clinic follow up were documented in less than 15% of patients (**Table 1**). Vital signs, including oxygen saturation by pulse

Table 1 - Documentations of initial assessment at the Emergency Department.

Documented history	**n**	**(%)**
History and duration of the attacks	74	(49)
History of previous β-agonist use prior to ER	72	(48)
History of hospitalization	20	(13)
History of ICU admission	15	(10)
History of intubation	15	(10)
History of nocturnal asthma symptoms	60	(40)
History of regular follow up	15	(10)
Documented initial assessment	**n**	**(%)**
Vital signs		(100)
PEFM excluding children	30/94	(31)
Accessory muscle use	30	(20)

ER - emergency room, ICU - intensive care unit
PEFM - peak expiratory flow meter

Table 2 - Drugs given after initial assessment at the Emergency Department.

Drugs	**n**	**(%)**
β-agonist	148	(99)
By nebulizer	146	(98)
One dose	42	(28)
Two doses	54	(36)
Three doses	30	(20)
Four doses	15	(10)
More than five doses	5	(3)
Steroid	72	(48)
Intravenous	18	(25)
Orally	53	(73)
Intramuscular	One patient	

Table 3 - Pre-discharge assessment and disposition medication and follow up 10 patients admitted to hospital, 140 discharged.

Assessment, disposition and follow up	**n**	**(%)**
Pre-discharge assessment		
Clinical assessment	67/140	(48)
PEFM (excluding children)	25/87	(29)*
Discharged drugs		
Corticosteroid	87/140	(62)
Oral corticosteroid	53	(38)
Inhaled corticosteroid	63	(45)
Inhaled β-agonist	90	(64)
Follow up arrangement	90/140	(64)
Family medicine	60	(43)
Pediatric clinics	20	(14)
Internal medicine clinics	6	(4)
Pulmonary clinics	4	(3)

* 7 out of 94 adults were admitted
PEFM - peak expiratory flow meter

oximetry, were documented in all patients. Peak expiratory flow was documented in 30 adult patients (30 of 94, 31%) **(Table 1)**. Almost all the patients received bronchodilator therapy (148/150, 99%), the majority (98%) by nebulization. Most needed multiple doses **(Table 2)**. Steroid therapy either orally or parenterally were offered to 72 patients (46%) **(Table 2)**. Repeat objective clinical assessment of response to prescribed medications was documented in 48% of patients and peak flow rate in 29% **(Table 2)**. Sixty-two percent of patients were prescribed steroids on discharge (38% orally and 45% as inhaled steroids) **(Table 3)**. Sixty-four percent were offered a follow up clinic appointment on discharge **(Table 3)**.

Discussion. The limitations of this investigation are those inherent in retrospective chart review studies. This study is not a review of the actual care given at the ER, but rather of what was documented in the patient's chart. The national guidelines recommend a few measurements that should be included in the ER assessment of all patients with acute asthma. These measurements include historical predictors of life threatening or potentially a life threatening asthmatic attack in addition to current indices of clinical severity. Unfortunately, such indicators were not documented in all patients' charts. In this investigation, accessory muscle use was documented in less than a fifth of patients. Similarly, peak flow rates were documented in only a third. Not only do peak flow rates predict the severity of the attack and the effectiveness and response to bronchodilator therapy (home versus hospital care)[14,15] but also and as importantly; the risk of early relapse and re-admission.[16,17] Evidence suggests that patients discharged with peak expiratory flow of less than 75% of their best or of their predicted reading and with diurnal variability of more than 25% are at a greater risk of early relapse and for re-admission.[16,17] Not surprisingly, peak flow-charting is recommended by all guidelines in the initial assessment of patients with acute asthma.[14,15] In an extremely busy ER, such as ours, time constraints may hamper the physician from documenting all relevant or crucial information. Notably, vital signs and pulse oximetry were documented in all patients' charts. This information is usually documented routinely by the nursing staff. Almost all the patients received bronchodilator therapy usually given by nebulization. Studies have shown that Spacer devices (holding chambers) are as effective as nebulizers for delivering bronchodilator therapy (β-agonist) in the emergency department. Furthermore, children receiving β2 agonists via metered dose inhaler and spacer are less likely to have tachycardia and hypoxia, than when the same drug is given via a nebulizer.[18-20] Early emergency department treatment of acute asthma, with systemic corticosteroids, reduces mortality, relapses, subsequent hospital admission and requirement, for β2 agonist therapy. The earlier they are given in the acute attack; the better is the outcome. Oral steroids are as effective as parenteral steroids.[20,21] Only 46% of our patients treated at the Emergency Department received steroids (either by oral or intravenous route) whereas 38% and 45% received steroids, either orally or by inhaler route, upon discharge from the ER. It is not quite clear from this study if this under utilization of steroids is due to concern about drug side effects, or is a reflection of a perceived relatively mild asthmatic attacks by the treating physician, particularly as only 6.7% patients needed admission to the hospital and more than 50% received 2 doses or less of nebulized bronchodilator therapy. Studies have shown that fewer patients required hospitalization at the time of reassessment after receiving any corticosteroid therapy in the first week after an exacerbation.[20,21] Furthermore, studies have shown that following recovery from the acute exacerbation, steroid tablets can be stopped abruptly and doses do not need tapering, provided the patient receives inhaled steroid.[22,23] The Emergency Department in our hospital is an open door for all Saudi and non-Saudi patients with acute illness. Patients, who are not eligible, usually do not have follow up at our hospital and management is limited only to emergency care during the acute illness. It will be interesting and informative if information regarding the outcome of those patients is available. This study, in addition to others from different countries,[9-13,24] highlighted deficiencies in the implementation of national guidelines in the management of bronchial asthma in the Emergency Department. It raises the need for further controlled trials to define more clearly the optimum strategies for guideline implementation and to evaluate the impact of such interventions on patients'outcome.

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