

Insufficient corticosteroids treatment in children with acute asthma

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Abstract

Recent surveys have shown that asthma management is still not optimal. The aim of this study was to determine the degree of utilization of the corticosteroids and others antiasthmatic medications in asthmatic children who were treated in the emergency room (ER). The study sample comprised of 230 children, who were seen in the emergency room of Assir Central Hospital and received treatment for their asthma during the time period of August 1996 to 31 June 2003. Information, regarding the previous medications which had been received prior to the emergency room's visit and the treatment which had been given at the emergency room, were collected from the records. Only asthmatic children with age of one year to twelve years and who were treated and discharged from the emergency room were included in this study. The striking findings of this study were that, less than one tenth of the patients were given intravenous corticoids (steroids), four patients were given oral steroids and none of them was given intramuscular steroids at the emergency room. Also, more than half of the patients had received anti- cough medications, and two thirds of the patients were given antibiotics. The under use of steroids and the over use of others medications for patients with acute asthma provided clear results in this study. Therefore, specific educational programs focusing on the need for increasing the rate of prescription rate and the adherence to steroids, will improve the overall degree of asthma control.

Introduction

Asthma is one of the commonest disorders of childhood. Morbidity resulting from asthma, in the form of school absence, general practice consultation and hospital admission, represents a major health problem [1] In addition, mortality from asthma remains unacceptably high. As insight into the pathogenesis of asthma increases, so does the appreciation of the complexity of the disease. Detailed morphological analysis of asthmatic airways reveals a combination of acute inflammatory changes characterized by a vasodilatation, an increased vascular-permeability and an influx of activated inflammatory cells, together with, more chronically structural alterations, the so-called "airway remodeling [2].

Systemic corticosteroids are the mainstay of treatment in children with acute asthma exacerbations [3]. As confirmed by several biopsy studies, the use of steroids is accompanied by an effect on the acute inflammation, with reduction in plasma exudation and cellular influx, as well as a more limited dosedependent effect on airway remodeling [2,4].

Recent surveys in Europe, Australia, Canada, and the USA have shown that asthma management is still not optimal [5,6]. Djukanovic et al., [7] concluded in their study that insufficient steroids use contributes much to the individual

asthma deaths and to the failure to prevent the frequent asthma attacks. It is likely that more preventive treatment would further reduce the morbidity for the average asthmatic's patients. Previous studies had explored the prevalence and the course of the condition without addressing how well asthma is being diagnosed and managed [8].

The aim of this study was to investigate the prevalence-utilization of corticosteroids and others medications in the emergency management of asthmatic children.

Subjects and Methods

Assir Central Hospital is serving a mixed socio economic status community. The study sample comprised of 230 children, who were visited the emergency department and received treatment for their asthma, from August 1996 to 31 June 2003. The patients were treated mainly by general practitioners, pediatric residents, pediatric house officers and senior registrars.

Information regarding the previous medications which received prior to the emergency visit and the treatment received at the emergency room were collected from the records. The patients included in this study were those who presented in the emergency department complaining of symptoms of asthma, their physical examination showed signs of bronchial asthma and their primary diagnosis was recorded as asthma. Only those children with age between one year and twelve year and who were treated and discharged from the emergency room were included in this study. The following treatments were looked at: nebulized , inhaled or oral β_2 agonist, intravenous , intramuscular , oral or inhaled steroids, intravenous or oral xanthines, nebulized or inhaled anticholinergics, cromolyn sodium, ketotefin, antibiotics, cough suppressants and oxygen therapy.

Data were analyzed using the SPSS and Epi Info software programs. Types of medications were presented in percentages and their 95% confidence intervals (95% CI) were calculated.

Results

The medications received prior to the admission to the ER varied. There were records of previous treatment of asthma symptoms in 136 (59%) of the patients. Ventolin, steroids and cough medicines were given in 121 (89%), 27 (20%) and 84 (62%) of the patients, respectively. Whether ipratropium bromide was prescribed, was not recorded in any of the visits.

The treatment in the E.R includes nebulized β_2 agonist which was administered to 208 (90%) patients. The frequency of β_2 agonist administration was: one-inhalation, two-inhalations, three inhalations and four or more inhalations in 42%, 39%, 15% and 4% of the patients, respectively. Aminophyllin was not given at all, whereas intravenous corticosteroids were used only in 20 (8%) patients and oral steroids in 15 (7%) patients. Ipratropium bromide was given to 97 (42%) patients, antibiotics were given to 45 (19.5%) patients and cough syrup was given to 17 (7%) patients. (Table 1).

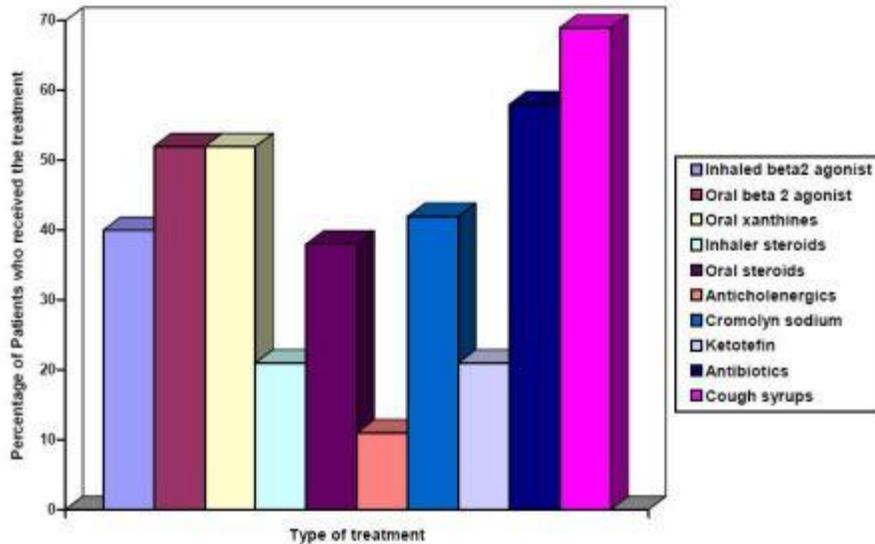
Table 1: Type and percentage (95% CI) of treatment prescribed during 230 visits of children with acute asthma who attended the emergency department

Type of treatment	Number of cases		
	N	%	(95%CI)
β2 agonist			
Nebulized	208	90	(84.1-95.3)
Inhaled	-	-	
Oral	-	-	
Xanthines			
Intravenous	-	-	
Oral	-	-	
Steroids			
Intravenous	-	8	(3.5-13.7)
Intramuscular	-	-	
Inhaler	-	-	
Oral	15	7	(0.9-7.6)
Others			
Anticholinergics	97	42	(26.8-44.3)
Cromolyn sodium	-	-	
Ketotefin	-	-	
Antibiotics	45	19.5	(3.4-12.6)
Cough syrups	17	7	(0.8-7.7)
O ₂ Therapy	150	62	(48.5-66.1)

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Oxygen was recorded as being given to only 150 (65%) patients. Also, 130 (57%) patients were requested to return back to the emergency room every eight hours to receive extra doses of nebulized β_2 agonist as needed. One hundred and ten patients (48%) were given appointment to the asthma follow up clinic in the outpatient department of Assir Central Hospital and 37 patients (16%) were given appointment with other hospitals. Prescribed home medicines like inhaled β_2 -agonist, oral β_2 agonist, oral theophylline, oral steroids, inhaled steroids, inhaled ipratropium bromide, cromolyn sodium, ketotefin, antibiotics and cough syrup were given to 92 (40%), 120 (52%), 50 (22%), 49 (21%), 87 (38%), 25 (11%), 49 (21%), 96 (42%), 134 (58%) and 160 (69%) patients, respectively, (Figure 1). The aerochamber and the babyhalers were prescribed for 80 (35%) patients only.

Fig. 1: Type and percentage of asthma treatment given for 230 children at time of discharge from the emergency room



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Discussion

The alarming findings in this study are that, only 8% and 7% of the patients were given intravenous and oral steroids at the emergency room, respectively. None of the patients was given intramuscular steroids.

At home, only less than a 25% of the patients were given oral steroids and approximately one third of them were given inhaled steroids. Most of the patients received salbutamole upon arrival to the emergency room but only half of them were given a prescription of the β_2 agonist to continue at home. Others alarming findings in this study are that more than half of the patients had received anti cough medications and two thirds of them were given antibiotics. Taken together, the under use of steroids treatment and over use of others medications for patients with acute asthma are very clear in this study. However, the incomplete data recording by the attending physician cannot be ignored and this could contribute, to some extent, to the above findings in this study.

One of the striking observations emerging from the Asthma Insights and Reality in Europe (AIRE) study is that, whereas most of the patients used as needed β_2 agonists, even in the group of patients with severe symptoms only 25% used inhaled steroids [9].

Numerous studies consistently show (in both children and adults) that, inhaled steroids are superior in improving the symptoms, the lung functions, the bronchial responsiveness, and the quality of life [10,11], as well as reducing the number of exacerbations as shown by Pauwels et al., [12] as compared to the monotherapy with short acting inhaled β_2 agonists.

Moreover, larger population studies done by Wennergren et al., [13] and Blais et al., [14] indicate that the use of inhaled steroids protects against severe exacerbations requiring hospitalization and reduces the likelihood of readmission or death following discharge from hospital. Analysis of the Saskatchewan Health Insurance data indicates that treatment with inhaled steroids also, diminishes the risk of fatal and near fatal asthma in the community [15]. Both; the insufficient prescription and the unwillingness of the patients to use the prescribed compounds are likely to contribute to the under use of steroids. The studies conducted by Bousquet et al., [16] and Gaist et al., [17], which are based on questionnaires as well as general practice records, indicate that maintenance treatment is still insufficiently prescribed by the physicians [16,17]. Results of similarly designed Canadian study indicate that most patients do not understand the rationale for using inhaled steroids and most of these patients have significant fears concerning the side effects of steroids [18]. In addition, Rutten et al. have shown that the cost of steroids and the resentment to the use of regular medication can further diminish patient adherence to the inhaled steroids [19]. However, the safety of low to moderate dosage of inhaled steroids, even when used over a long period, is increasingly being recognized [20], and reiteration of this information to both physicians and patients would, therefore, seem very appropriate. It has been shown that specific educational programs focusing on the practical

implementation of concepts introduced in the guidelines will increase the prescription rate and the adherence to steroids and will lead to an improvement in the overall degree of asthma control [21].

In conclusion, there are a small number of patients with asthma who received either oral or inhaled steroids in the emergency room as well as at home. The present study provides a basis for developing an agreed asthma protocol within the practice, derived from the international guidelines of asthma treatment. It also provides the support for the Ministry of Health to implement the National Asthma Program and to encourage the physicians to adhere to its guidelines. In addition, the initiation of asthma mini clinics can effectively help in improving the quality of care [22].

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