

Original Article

Use of Controller Medications among Asthmatic Patients: A Family Medicine Centre based Study

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ABSTRACT

Objectives: To determine the prevalence of under use of controller medication among asthmatic patients; and to investigate associated factors.

Design: Cross-sectional sample study

Setting: Khaldiya Primary Healthcare Centre, Kuwait

Subjects: One-hundred and sixty-two patients were studied during September to December 2004, age range from 3.5 to 83. Data were obtained through direct questionnaire.

Main Outcome Measures: Socio-demographic data, use of medication

Results: Out of 162 patients, 140 (86.4%) reported not using controller medication. One hundred and five participants (64.8%) had uncontrolled asthma, and only 22 participants (13.6%) used controller medication prior to the study (prescribed by specialist). Fear of steroid dependence and/or side effects was reported by 70.4%

and highest among parents whose children were of age 4-10 years. For adults, fear of steroids increased with age (60.7% for age > 40 versus 44.4% for age 20 to 30, $p < 0.001$). Participants with higher than high school education reported less fear of steroids than those with high school degree or less (57.6% versus 80%, $p < .01$). One hundred and five cases (64.8%) required initiation of controller medication. Only 28 cases (17.3%) did not require alteration to their original management plan.

Conclusion: Under use of controller medication in asthma patients is mainly due to concern about steroid dependence and/or side effects. Such concern increases in older patients, younger children, and low level of education of patient/parent. Concern was not limited to participants. Even doctors in the primary health care showed reluctance to prescribe controller medication.

KEY WORDS: asthma, controller, fear, Kuwait, steroids, under use.

INTRODUCTION

Asthma is now widely recognized as a chronic inflammatory condition of the airways that requires early pharmacological treatment and long-term management^[1]. Anti-inflammatory agents, particularly inhaled corticosteroids, are the most widely used and consistently effective controller medication for long-term maintenance therapy. Clinically, inhaled corticosteroids reduce the severity of asthma symptoms, improve peak flow measurements and other measures of lung function, prevent exacerbations and possibly prevent long-term lung remodeling.

Despite significant advances in the understanding of asthma and its pharmacological management, the prevalence of asthma is on the increase^[1]. Although as previously mentioned, the most effective long-term control medicines available are inhaled corticosteroids, a recent national survey in USA showed that four out five people with chronic asthma are not using these medicines^[2]. Data in Kuwait shows that 18% of the population is

reported to suffer from asthma manifestations^[3]. Kuwait ranked 13th among 56 countries in the prevalence of symptoms of asthma in children^[4].

This is alarming because asthma is a serious and potentially life threatening disease. In this cross-sectional study we aimed to determine the prevalence of under use of controller medications and investigate the associated reasons for this under-use of controller medications in asthma patients at Khaldiya family medicine healthcare centre and what might alter these treatment patterns.

SUBJECTS AND METHODS

Khaldiya clinic is a family medicine clinic that serves a population of 13,000. By using the ministry of health computer registry system, we identified 1907 patients registered as asthmatics. Out of these, 1343 were Kuwaiti citizens and 564 were expatriates. Only 364 were registered in the asthma clinic registry. This number is explained by the fact that many asthmatic patients seek help only during

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acute attack and are thus not registered in the asthma clinic registry. Also, the expatriate population has a high rate of turn over. In this cross-sectional sample, survey data were collected through a face to face interview using a structured questionnaire.

The sample comprised all adult patients and parents of children less than 18 years of age (n = 162) attending the asthma clinic at Khaldiya healthcare centre for follow up during the period between September and December 2004. Patients attending the clinic with acute asthma attacks were not included in the study.

The age of participants ranged from 3.5 to 83 years. The questionnaire included demographic data such as age, sex, occupation, level of education for adults and parents of children less than 18 years of age.

The height of patients was measured because it is a required parameter for the assessment of the expected peak flow rate (PFR). Actual PFR was measured using a peak flow meter. Measurements were done following the technique provided by the GINA guidelines^[5]. Management plan and patient compliance to treatment were also noted.

Participants were asked about the use of controller medication prior to interview and the doctor who prescribed it and whether patient/parent feared steroid dependence and/or side effects. Current symptoms were determined by asking about the number of days the patient experienced any asthma symptoms (including cough, wheeze, shortness of breath, or limited activity) during the past 14 days. All participants that were considered as uncontrolled were prescribed controller medication in the form of a separate or combined inhaler. For those already on controller medication, the dose was adjusted. Written instructions on how and for how long to use the medication and what were the major side effects were provided. Participants were seen two weeks later when their PFR was measured and enquiry about their symptoms was made.

Statistical analysis

Data was analyzed using the statistical package for social science, SPSS, version 13 (Chicago, IL, 2004). The value $p = 0.05$ was used as the cut-off level for statistical significance. The Chi-square test was used to assess the association between two categorical variables.

RESULTS

The demographic characteristics of our survey sample of 162 patients are shown in Table 1. There was a male preponderance with male: female ratio 59.9:40.1. The sample included 80 children (< 18

Table 1: Sociodemographic characteristics of participants

Variables	Frequency	Percent
Sex		
Male	97	59.9
Female	65	40.1
Age(In years)		
< 4	2	1.2
4-	41	25.3
10-	37	22.8
18-	9	5.6
30-	17	34.6
40	56	34.5
Level of education		
Below high school	15	9.3
High school	81	50
University and above	66	40.7
Occupation		
Student	80	49.4
Teacher	17	10.5
Employee	31	19.1
House wife	20	12.3
Others	14	8.6

years of age) and 82 adults (>18 years of age). One half of the sample was high school graduates. Students had the highest prevalence of asthma amongst all occupations (49.4%). Only 22 participants (13.6%) were followed up by a specialist. A majority (115 participants, 71%) reported that they were

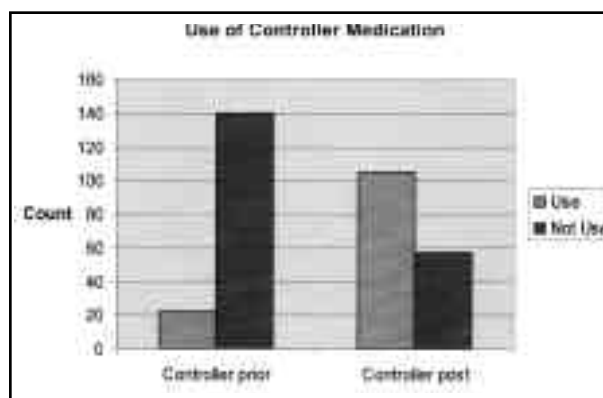


Fig. 1: Use of controller medication

compliant to treatment.

Fig. 1 illustrates that 140 cases (86.4%) did not use controller medication as compared to 22 cases (13.6%) that were on controller medication provided by a specialist prior to the study. The difference was significant at $p < 0.0001$ for prior controller use and $p < 0.0001$ for post controller use. However, 105 cases (64.8%) were in the category of uncontrolled asthma and were prescribed controller medication.

Out of 162 participants, 114 (70.4%) reported that they fear steroid dependence and their side effects as compared to 29.6% who reported no fear of steroids ($p < 0.0001$, Fig. 2).

Table 2 shows the association between demographic

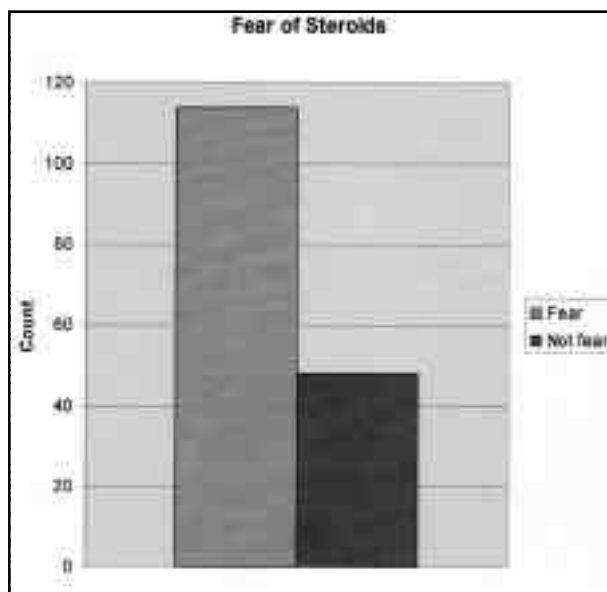


Fig. 2: Fear of steroids

Table 2: Association between demographic data and fear of steroids

Variables	Fear %		p- value
	Yes	No	
Sex			0.1
Male	75.40	24.60	
Female	67.00	33.00	
Educational Level			0.01
Below high school	80.00	20.00	
High school	79.00	21.00	
University and above	57.60	42.40	
Age (In years)			0.001
< 4	50.00	50.00	
4-	90.20	9.80	
10 -	81.10	18.90	
18-	44.40	55.60	
30-	47.10	52.90	
40-	60.70	39.30	

factors and fear of steroids dependence and side effects. Fear of steroids significantly varied with age. It was noted that it was maximum at the age of 4 - 10 years (90.2%) and this reflected parent's fear of steroids. For adults the fear of steroids consistently increased with age (44.4% for ages between 18-30 yrs, 47.1% for ages between 30 - 40 yrs, and 60.7% ages 40 yrs, $p = 0.001$).

Participants with university and above level of education reported less fear of steroids than those with below high school level education (57.6% versus 80%; $p < 0.01$)

Table 3 shows that of the 162 participants, only 28 cases (17.3%) did not require alteration of their management plan. The remaining 134 participants required changes in their original management plan either by adjusting the dose of their medication or adding controller medication in the

Table 3: Difference between the original and the new management plan

Management Plan	Frequency	Percentage
Original Management		
Salbutamol inhaler as needed	23	14.2
Salbutamol nebulizer as needed	31	19.1
Salbutamol inhaler regular	58	35.8
Salbutamol nebulizer regular	20	12.3
Controller as needed	12	7.4
Controller regular	9	5.6
Others	9	5.6
New Management		
No change	28	17.3
Salbutamol regular	29	17.9
Combined therapy	40	24.7
Separate	59	36.4
Others	6	3.7

form of separate or combined therapy.

DISCUSSION

The data showed substantial under-use of controller medication among patients attending the asthma clinic at Khaldiya family medicine healthcare center. Only 22 patients (13.6%) were on controller medication prior to our study despite the fact that 105 patients (64.8%) were in the category of uncontrolled asthma and were either prescribed controller medication or the dose of their medication was adjusted. This means that almost two thirds of participating patients were under treated with controller medication.

In a previous study regarding under use of controller medications, Finkelstien *et al* in 2002 found that 72.9% of children with persistent asthma were under users of anti-inflammatory medications^[6].

Under use of controller medications in the presence of persistent symptoms was alarming. Goodman *et al*^[7] found that only 29% of children in an HMO (Health Maintenance Organization) who were prescribed an anti-inflammatory agent had more than two canisters dispensed during a one year period. A study from the pediatric asthma care PORT (patient outcome research team) reported that 69% of those with three dispensings of a beta agonist had a controller medication dispensed, and only 48% had repeated dispensing (3)^[8]. In surveys of MCO (Medicaid Managed Care Organization) members, Diette *et al* reported that 64 adult users of inhaled corticosteroids reported under dosing (use < 5 / wk)^[9]. In another study about under use of inhaled steroid therapy in elderly patients with asthma, Sin *et al* found that 40% of elderly patients did not receive inhaled steroid therapy within 90 days of discharge from their initial hospitalization from asthma. Patients > 80 years of age were at greater risk of not receiving inhaled steroid therapy compared to those 65 to 70

years of age^[10].

The present study showed that the main reason for under use of anti-inflammatory medication is fear of steroid dependence and side effects. When we examined the association between variables with fear of steroids, we found that the level of fear was highest among young children (90.2%); this reflects their parents' fear of corticosteroids. Lim Sh *et al* found that 36% of parents either felt opposed to inhaler therapy and / or preferred oral medication. The main reason for their reluctance to use inhalers was related to fear of dependence^[11]. In a study about asthma knowledge and medication compliance among parents with asthma children Zhao *et al*^[12] found that only 43% of parents reported adherence with prescribed anti-asthmatic medication for their children. Reasons for non-compliance included fear of medication side effects and tolerance. Leickly *et al*^[13] identified concerns about adverse effects and doubts about the usefulness of medications. A recent study about parental concern towards the use of inhaled therapy in children with chronic asthma Chan *et al* found that 66% of parents surveyed were concerned with inhaled therapy. The most common concern with its use was medication side effects (91%) followed by inhaler dependency (86%), cost of the inhaler (34%) and difficulty in using the inhaler (15%)^[14].

As to reasons why patients refused treatment with inhaled steroids the following were found: In a review by van Grunsven of the literature over the past 35 years, a general fear of adverse effects played an important role for non acceptance. Lack of knowledge about efficacy and side effects of treatment is another important factor. Lack of symptoms is another factor for reluctance to use drugs^[15].

The finding that fear of steroids is highest among those with less than high school education is consistent with the findings of our study, Finkelstien *et al*^[16] found that parents with more than high school education were less likely than those with a high school degree or less to have a child who under-uses controller medication.

The finding that 134 participants required alteration to their current management plan and the finding that 105 participants required the initiation of anti-inflammatory medication raises the issue of primary care physicians' reluctance to use controller medication. This is consistent with the conclusion of Leogorreta *et al*^[16] that asthma specialists provided more thorough care than primary care physicians in treating patients with asthma. In the study by Sin *et al*, they also found that elderly patients who receive their care from primary care physicians were at higher risk of not receiving inhaled steroids in comparison with those

under the care of specialist^[10]. Hartert *et al* in their study about under-utilization of controller and rescue medication concluded that despite widespread promulgation of the National Asthma Education Program guidelines, providers caring for indigent older subjects with moderate to severe or potentially fatal asthma were not following these guidelines^[17]. In an article about strategies to overcome steroid phobia by Margie Patlak, she quotes from Frank Leone, MD, a pulmonologist at the Thomas Jefferson University in Philadelphia 'The nagging suspicion that the complications of inhaled corticosteroids are severe enough to warrant worry has interfered with how clinicians use the medications'^[18].

Another reason for under-use of controller medication could be attributed to the lack of essential drugs in primary health centers in Kuwait. This was found in a study by Behbehani *et al*^[4]. The study, which covered 36 primary care centers, surveyed the availability of essential asthma medications. None of the centers was found to have high dose inhaled steroids. Low dose beclomethasone inhalers were available regularly in 11 out of the 36 centers (31%). Although beclomethasone is available in Khaldiya healthcare center it does not provide optimum control like the new more expensive high dose steroid inhalers.

CONCLUSION

A significant proportion of adult patients and parents of asthmatic children attending Khaldiya asthma clinic showed under-use of controller medications. This was mainly due to their concern about steroid dependence and/or side effects. Such concern increases in older patients, younger children, and in those patients/parents with low level of education. These factors should be taken into account when planning an effective asthma education program. Not only were the participants concerned, but also the doctors in the primary health care centers who showed reluctance to prescribe controller medications. Based on this study, the need for programs designed to improve asthma care in the primary healthcare centers in Kuwait is very much evident.

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