Common Causes of Non-Compliance in the Use of Inhalers in Children 5 to 12 Years of Age with the Diagnosis of Asthma

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Abstract

Objective: To determine the common causes of non-compliance when using inhaler therapy in pediatric population at Gulab Devi Teaching Hospital, Lahore.

Method: In cross-sectional study, the Random sampling (purposive sampling) technique was used. The study was carried out in the pediatrics department, Gulab Devi Teaching Hospital Lahore, Pakistan. SSPS version 21 was used to evaluate the data.

Results: The present study comprised 100 Asthmatic patients, with an average age of 9.12 and a standard deviation of 2.38. Out of a total of 100 patients, 37 (37%) were male and 63 (63%) were female patients. 26 % had shown good compliance with the medication and 74% had shown noncompliance. Common factors of non-compliance were affordability (40%), poor inhaler technique (19%) and social issues (15%).

Conclusion: Inhaled medications are the mainstay of treatment for asthma. Compliance of the patients especially in the paediatric age group remains a great challenge. Common factors that were observed for non-compliance were affordability, poor inhaler technique and social issues.

Keywords: Asthma, inhaler, inhaler technique, drug compliance

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Introduction

Asthma is a chronic obstructive pulmonary illness that presents with a different constellation of signs and symptoms including cough, difficulty in breathing, wheezing sound from the chest, feeling of tiredness and chest congestion. The patient may present with acute exacerbation of symptoms in conditions with infections involving the respiratory tract and exposure to a sensitized allergen which may lead to respiratory failure in extreme conditions.[1]

Worldwide, it is estimated that around 300 million people suffer from asthma and the number affected is increasing especially in the paediatric population. World Health Organisation states that in one year, almost 15 million disability-adjusted life years are wasted.[2] and another survey shows that asthma results in the loss of tens of millions of schooling days per year.[3]

Hyper-responsiveness of the respiratory passage increased mucus production, immune dysregulation and remodeling of the respiratory passage are all linked to asthma. In the immunologic pathways of asthma, both innate and adaptive immunity play a role. Asthma is a common chronic lung condition in children that produce wheezing, dyspnea, chest tightness, and coughing. These symptoms can frequently be managed by avoiding or lowering asthma triggers (allergens and irritants) and adhering to medical advice (starting asthma control

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drugs or changing the present treatment regimen as needed).[4] A prevalent characteristic of asthma is type 2 asthma with eosinophilia. It can happen with or without a noticeable allergy. Non-type 2 asthma is the second major subtype of asthma, which includes a diverse range of endotypes and phenotypes such as exercise-induced asthma, obesity-induced asthma, and so on. Infections, cigarette smoke, and pollution can cause neutrophilic asthma, which is not caused by allergens.[5] Dyspnea, which is occasionally linked with 'respiratory pain,' cough, and wheezing are the key symptoms used to diagnose asthmatic illness. A qualitative score (mild, moderate, and severe) or a visual analogue scale are occasionally used to quantify these symptoms (VAS).[6] Airway hyperresponsiveness (AHR) is the underlying cause in asthmatic patients that leads to narrowing and remodeling of the bronchial tree over time. There is hypertrophy of the smooth muscles encircling the air passages and an increased number of mucus-producing cells that explain many of the symptoms observed in asthmatic patients.[7]

In the paediatric age group, asthma is a challenge both for the parents and the pediatrician. Though allergen-induced cases are common and obvious, and seasonality may become apparent with time but virus-induced asthma is still widespread.[8] The relative impact of each trigger on disease activity may fluctuate depending upon the child's age. This is because smaller airways and flexible rib cage are more pliable and hence more prone to airway obstruction.[9] Atopy is favored in paediatric population due to immature and developing immune system.[10] During the initial years of life, interactions between immune system maturation and lung growth and development appear to be critical in the development of asthma.[11] All of these events are impacted by the combination of genetic, developmental, and environmental variables.[12]

Inhaled corticosteroids either alone or in combination with long-acting beta 2 agonists are the mainstay of therapy in asthmatic patients with persistent symptoms.[13] Combination inhalers have the advantage of treating asthma with lower corticosteroid doses, are relatively cost-effective and may ensure compliance with the medication as provide better control of symptoms than corticosteroids alone.[14] Adherence to the inhaler is a challenge, especially in the paediatric population suffering from asthma. According to a study, it was estimated that less than 50 percent of the paediatric patients show adherence to the prescribed medication for asthma.[15] Thus pediatricians should strain to identify and deal with the factors resulting in non-adherence to inhalation therapy as it is the mainstay of therapy in asthma. The objective of our study is to determine the common causes of non-compliance when using inhaler therapy in paediatric population at Gulab Devi Teaching Hospital, Lahore.

Materials and Methods

This cross-sectional study was carried out in the pediatrics department, Gulab Devi Teaching Hospital Lahore, Pakistan. The duration of the study was of six months. The sample size determined was 100 with 95% confidence interval and 5% margin of error. Non-probability sampling technique was used. Children of ages 5 to 12 years, diagnosed with asthma and prescribed inhaler therapy were included in the study. While children less than 5 years and more than 12 years, those not using inhaler for asthma control and those in whom wheezing episodes were due to causes other than asthma were excluded from the study. One hundred cases with diagnosed asthma and on inhaler therapy in the specified age group presenting to the paediatric department of Gulab Devi Hospital were included in the study. Demographic information including name, age, sex and weight were recorded and informed consent were taken from their parents. Compliance with the treatment and reasons for noncompliance were recorded with the help of a proforma. All collected data was statistically analyzed by using SPSS 21 version. Descriptive statistics like Mean, Median, Mode and S.D were applied. Frequency was studied by statistical test. Qualitative and quantitate data were presented in the form of figures and tables.

Results

The current study showed a mean weight of 22.39 of the patients involved in the study with a standard deviation of 5.043 (Table 1). The subjects involved in this study had an age and mean±SD of 2.38±9.1237. For gender distribution, 37(37%) were males and 63(63%) were females. In this study, 55(55%) patients belonged to poor families, 24(24%) patients belonged to rich families and 21(21%) patients belonged to middle-class families. In this study, 9(9%) patients had asthma for 1 week, 15(15%) patients had asthma for 2 weeks, 20(20%) patients had asthma for 3 weeks, and 26 (26%) patients had asthma since 1 month while 30 (30%) patients had asthma for 2 or more months. In this study, all patients were prescribed inhaler therapy out of which 44(44%) patients had used inhaler previously while 56(56%) patients had not used inhaler. In this study, 54(54%) patients were not using

inhaler at all, while 18(18%) patients were using inhaler for 1 week, 12(12%) patients were using inhaler for 2 weeks ,11(11%) patients were using inhaler for 3 weeks and 5(5%) patients were using inhaler for almost 1 month. In this study, 19(19%) patients were having improper inhaler technique while 81(81%) patients inhalation technique was proper. Out of 100 patients 26(26%) had shown proper compliance to inhaler technique and 74(74%) had shown non-compliance (Fig 1). Out of 74 patients the reason for non-compliance in 15(15%) patients were because of social

Table 1: *Statistical Analysis of Patients*

No. of patients	Mean	Median	Mode	S.D	Skewness
100	22.39	22	25	5.04304	-.303

issues (misinforms), 19(19%) patients was because of their poor technique and in 40(40%) patients was because of affordability (Fig 2).

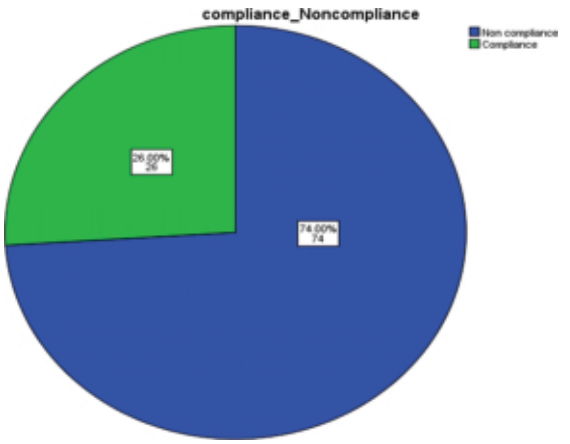

Fig-1: *Frequency Distribution of Compliance & Noncompliance*

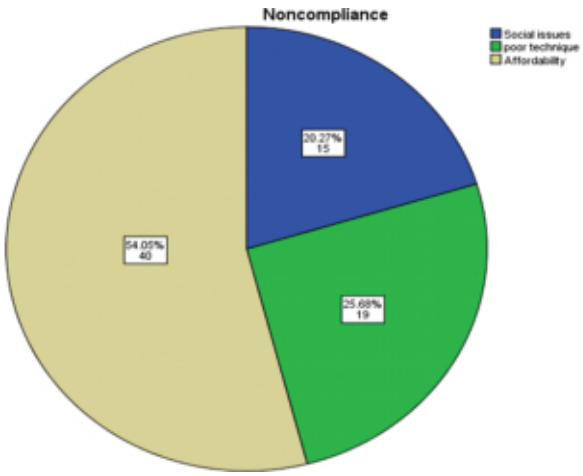

Fig-2: *Frequency Distribution of Noncompliance*

Discussion

Asthma is a chronic obstructive pulmonary disease that presents with different signs and symptoms of the respiratory system. Asthma is more of a problem in the paediatric age as it results in absence from school, impacts the growth of the developing child, results in behavioral problems and causes a lot of anxiety and concern for the parents as well. One of the reasons for poor asthma control in this age group is poor compliance with the inhaled medication. Doctors treating asthmatic patients should have a good knowledge about the factors responsible for poor adherence to the therapy, so they can counsel the patient and parents accordingly.

The present study emphasizes affordability of the medication to be the main factor for non-compliance. Pakistan like other developing countries has a vast majority of people below the poverty line and cost of medication is an extremely important factor for non - compliance in setup. Parveen et al came to the same conclusion that cost of the inhaled medication is the most important reason for non-compliance with a percentage of 41 percent (comparable to the present study's percentage of 40 percent). Same study showed that 15.6 percent patients stopped using inhaler due to difficulty in learning the correct technique.[16] It can be related to the present study's conclusion of poor technique of 19 percent causing non-compliance. Another related study shows poor education of the patient on the use of inhaler medication to be a reason for non-adherence to treatment.[17]

In Developed countries, studies show cost to be not a major factor for non-compliance but the main reasons for concern were side effects of the medication (58 percent) and the perception of addiction to inhaler therapy (31 percent).[18] In another study conducted at Lahore, 38.4 percent patients were showing poor compliance due to forgetfulness and 34.5 percent discontinued the medication on their own when the symptoms improved.[19]

One factor that is an important reason for non-compliance is the social stigmata of the disease.15 percent patients stopped using the medication as per the present study's results. Bisko et al showed defiance behavior and peer pressure to be important factors resulting in stopping the therapy.[20]

Conclusions

Asthma is a chronic lung condition especially in the

modern developed era. Inhaled medications are the mainstay of treatment. Compliance of the patients especially in the paediatric are group remains a great challenge. In the present study, about 100 asthmatic patients 26 % had shown compliance and 74% had shown noncomp-liance. Common factors that were observed of non-compliance were affordability, poor inhaler technique and social issues.

Conflict of Interest *None*

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Authors Contribution

: Conceptualization of Project
: Data Collection
: Literature Search
: Statistical Analysis
: Drafting, Revision
: Writing of Manuscript