



ANTI-LEUKOTRIENE COMPARED TO INHALED CORTICOSTEROID FOR RECURRENT WHEEZING IN CHILDREN LESS THAN FIVE YEARS OF AGE

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Abstract:

Background: Many children with asthma continue to have symptoms even after receiving maintenance treatment with medicines.

Objective: The aim of this study was to compare the anti-leukotriene versus inhaled corticosteroid in the treatment of recurrent wheezing in children less than five years

Material and method: The present randomized control study was carried out at the department of Pediatrics Gambat Institute of medical and health sciences from January 2017 to June 2017 after taking permission from the research committee of the institute. A total 74 children less than 5 years of age of both genders with recurrent wheeze (more than three episodes in the previous year) or moderate persistent asthma according to NIH guidelines (two or less nighttime symptoms per month and everyday symptoms that occur many times per week but not daily) were included. The participants of the study were divided equally in to group A and B. The group a was treated with inhaled fluticasone 55 mcg twice daily with a spacer device with a face mask, and group B received the granules of 4 mg montelukast daily in the evening. Both the groups were followed up for 6 months and decline in the wheezing was considered as the response to the medicines. The data was analyzed using the SPSS version 16.

Results: A total of 74 individuals were enrolled in this study out of which 37(50%) were girls and 37(50%) were boys. Gender differences were not statistically significant. 40 patients (54.0%) had wheezing symptoms when crying, 70 patients (94.5%) while resting, and 30 patients (40%) while sleeping. Furthermore, 31 patients (41.8%) had a family history of asthma, 53 patients (71.6%) had a family history of atopy, & 50% of the participants had a history of passive smoking. Children under five who wheezed did not have a statistically significant correlation with a family history of asthma, atopy, or smoking habit ($P > 0.05$). Following six months of inhaled fluticasone therapy, thirty individuals (81.0%) showed substantial improvement (P less than 0.001). Additionally, following six months of intervention, 27 of the participants (72.9%) in the montelukast group had a

substantial response to therapy ($P < 0.001$). The response to therapy did not differ statistically significantly between the two patient groups receiving montelukast or inhaled fluticasone.

Conclusion: The current study concluded that there was no statistically significant difference in the decrease of wheeze in children under five years old between the therapeutic effects of fluticasone and montelukast.

Key words: Asthma, Wheezing, Fluticasone, Montelukast

Introduction

The most prevalent chronic disease in children is asthma, which raises challenges with regard to treatments that may change the disease's course and reservations about the safety of constant use of controller medicines.¹ Current understandings of asthma have focused on the illness's childhood development and allergic component, however a number of extensive network studies are now demonstrating serious asthma can manifest in a variety of ways, with just 30–50% of them meeting the conventional criteria for childhood onset allergies.² Asthma is a prevalent disorder, hence efforts are made to find the best possible therapy.³ Low-dose ICS are advised as the recommended immunotherapy (also known as step 2 of therapy) for the management of children with moderate chronic asthma. Asthma treatment guidelines advise adding an anti-leukotriene drug to current ICS as one among three therapeutic choices to enhance therapy (step 3) in children with insufficient asthma control on low levels of ICS (step 2).⁴ Adults and children with recurrent and/or chronic asthma can benefit from anti-leukotriene monotherapy (5-lipoxygenase inhibitors & leukotriene receptor antagonists) as an alternative to ICS.⁵ According to asthma recommendations, antileukotriene drugs can be utilised in second-step intensity treatment in place of ICSs.⁶ Children with chronic asthma who received montelukast as monotherapy experienced an excellent result for themselves, their parents, as well as their doctors.⁷ Leukotriene receptor antagonists, like montelukast, offer a simple, safe, and efficient therapeutic alternative, especially for preschool-aged children, and can be used as an adjuvant therapy for individuals with asthma that is difficult to manage.⁸ A significant number of children receive inadequate diagnosis and care. Additionally, there is potential for improvement in the way asthma is managed.⁹ Many children with asthma continue to have symptoms even after receiving maintenance treatment with inhaled corticosteroids (ICSs), despite clinical research demonstrating that ICSs can effectively manage pediatric asthma.¹⁰ Treatment adherence is frequently inadequate.¹¹ It is recommended that pediatric healthcare providers regularly assess asthma control, regardless of the cause for the visit.¹² For avoiding flare-ups, symptom-based action plans are better than peak-flow-based ones, although step-up treatment is not better than daily controller medication.¹³ Pharmacogenomics indicators that have recently been discovered might be an initial phase in customizing treatment for each asthmatic patient based on their genotype, and treatment that is adapted to each patient's degree of inflammation of their airways is already becoming more widely used in clinical settings.¹⁴ The existing body of evidence supports the need for additional research on these management techniques, including direct comparisons between leukotriene receptor antagonists and inhaled corticosteroids and the function of long-acting beta-agonists, which may be used to target the early childhood wheezing subgroups most at risk for the persistence of asthma symptoms when they enter broader clinical use.¹⁵ The present study was conducted to compare the anti-leukotriene versus inhaled corticosteroid in the treatment of recurrent wheezing in children less than five years.

Material and method

The present randomized control study was carried out at the department of Pediatrics Gambat Institute of medical and health sciences from January 2017 to June 2017 after taking permission from the research committee of the institute. A total 74 children less than 5 years of age of both genders with recurrent wheeze (more than three episodes in the previous year) or moderate persistent asthma according to NIH guidelines (two or less nighttime symptoms per month and

everyday symptoms that occur many times per week but not daily) were included while individuals with cystic fibrosis, congenital heart diseases and gastro-esophageal reflux were excluded. Written consent was taken from the parents of the children. The participants of the study were divided equally in to group A and B .The group a was treated with inhaled fluticasone 55 mcg twice daily with a spacer device with a face mask, and group B received the granules of 4 mg montelukast daily in the evening. Both the groups were followed up for 6 months and decline in the wheezing was considered as the response to the medicines. The data was analyzed using the SPSS version 16. The qualitative variables were presented in frequencies and percentages while the quantitative variables were presented in mean $\pm$ standard deviation (SD).

Results

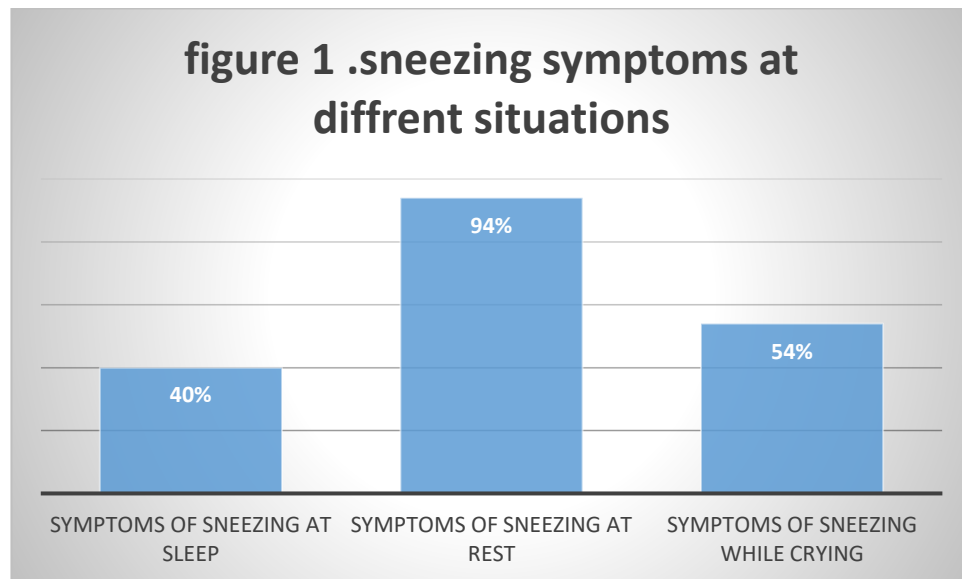
A total of 74 individuals were enrolled in this study out of which 37(50%) were girls and 37(50%) were boys. Gender differences were not statistically significant ($P = 0.61$) as presented in **table 1**. 40 patients (54.0%) had wheezing symptoms when crying, 70 patients (94.5%) while resting, and 30 patients (40%) while sleeping as presented in figure 1. Furthermore, 31 patients (41.8%) had a family history of asthma, 53 patients (71.6%) had a family history of atopy, & 50%) of the participants had a history of passive smoking. Children under five who wheezed did not have a statistically significant correlation with a family history of asthma, atopy, or smoking habit ($P > 0.05$) as shown in **table 2**. Following six months of inhaled fluticasone therapy, thirty individuals (81.0%) showed substantial improvement (P less than 0.001). Additionally, following six months of intervention, 27 of the participants (72.9%) in the montelukast group had a substantial response to therapy ($P < 0.001$) as presented in **table 3**. The response to therapy did not differ statistically significantly between the two patient groups receiving montelukast or inhaled fluticasone ($P = 0.38$).

Table 1.Demographic features of the study participants			
Features	Group A N= 37	Group B N=37	Value of P
Gender			
Male	23(67%)	26(70%)	0.61
Female	14(33%)	11(30%)	

Table 2.Impact of smoking and family history on wheeze in children under five			
Variables	Yes	No	Value of P
Passive smoker	37(50%)	37(50%)	1
Family history of asthma	31(41.8%)	43(58.1%)	0.148
Family history of atophy	53(71.6%)	21(28.3%)	1

Table 3.Impact of fluticasone & montelukast treatment

Treatment response	Group A	Group B
Yes	30(81.0%)	27(72.9%)
No	7(19%)	10(27.0%)
Value of P	< 0.001	< 0.001



Discussion

Asthma is a chronic disorder of respiratory tract that effect 10-15% of children less than 5 years of age and wheezing is seen in 40% of these children.¹⁶ In children under five, symptoms such persistent wheezing, coughing, dyspnea, and airway hyperresponsiveness along with a favourable response to bronchodilators are used to diagnose asthma.¹⁷ In the present study we evaluated the anti-leukotriene versus inhaled corticosteroid in the treatment of recurrent wheezing in children less than five years. According to our findings, wheezing in children under five with ICS and montelukast showed a considerable improvement with no variations in each group's level of treatment effectiveness. The most prevalent symptom in children is wheezing, which can also be accompanied by coughing and dyspnea. Additionally, wheezing frequently results in hospitalizations and referrals to the pediatric emergency room.¹⁸ In order to avoid irreversible lung damage, reduced lung function, and resistant asthma, early childhood asthma treatment is crucial.¹⁹ ICSs decrease airway inflammation and are crucial in the treatment of asthma, especially in older children.²⁰ ICSs are the treatment of choice for asthma, according to GINA recommendations, whereas anti-leukotrienes are an extra or alternative therapy for mild persistent asthma. Mild persistent asthma is defined by daily symptoms that happen many times a week but not daily and sporadic nighttime symptoms.²¹ According to this study, children under five years old with moderate chronic asthma respond similarly to oral montelukast and inhaled fluticasone, and there was no statistically significant difference in the two medications' effects ($P = 0.38$). According to a recent research, individuals with mild persistent asthma who got montelukast responded better, adhered better, and experienced fewer exacerbations than those who received budesonide inhalers.²² Through bronchoprotection and airway inflammation reduction, first-line anti-leukotriene usage improves treatment and management of moderate asthma.²³ In situations with inadequate control, anti-leukotrienes are a supplementary treatment to ICS.²⁴ Wheezing can be brought on by a variety of respiratory viral illnesses. On their initial visit, every one of our patients exhibited cold symptoms. Our findings support previous research in that montelukast reduces virally-induced exacerbations in young children.²⁵ According to previous research, montelukast-treated participants experienced less symptoms of wheezing and shortness of breath brought on by exercise.²⁶

Conclusion

The current study concluded that there was no statistically significant difference in the decrease of wheeze in children under five years old between the therapeutic effects of fluticasone and montelukast. However, due to montelukast safety, efficacy, and oral administration, as well as the

numerous adverse effects of ICS & the absence of a discernible difference between the two medications' therapeutic effects, we advise taking it.

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