



Effect of Budesonide/Formoterol versus Budesonide Alone On FEV1% Over 3 Month Study Period

^{MD1}Wasim A. Wani, ^{MD1}Dr Sheeraz A. Dar, ^{MD2}Duri S. Yattoo

^{MD1}Department of Pediatrics and Neonatology, ^{MD2}Department of Obstetrics and Gynecology,

^{MD1}Sher-I-Kashmir Institute of Medical Sciences Hospital, Srinagar, Jammu & Kashmir, India

^{MD2}Sher-I- Kashmir Institute of Medical Sciences, Medical College Hospital, Bemina, Srinagar

***Corresponding Author:**

Dr. Sheeraz A. Dar

Senior Resident, Department of Pediatrics and Neonatology, Sher-I-Kashmir Institute of Medical Sciences Hospital, Srinagar, Jammu & Kashmir, India

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Objective: To study whether budesonide/formoterol combination is better than budesonide in improving FEV1 after 3 month of study period.

Study Design: Randomized controlled trial.

Participants: 60 child aged 6-15 years of age with moderate persistent asthma divided into 2 treatment group

RESULTS: After 3 months, FEV1 in budesonide/formoterol group was 83.5 ± 2.57 compared to budesonide group in which FEV1 was 81.7 ± 3.7

Conclusion: Budesonide/formoterol is better than budesonide alone in improving FEV1

Keywords: NIL

Introduction

Asthma is a chronic inflammatory condition affecting lung airways resulting in episodic airflow obstruction. The chronic inflammation increases the twitchiness of the airways - airway hyperresponsiveness- to provocative exposures^[1]. According to the National Asthma Education and Prevention Program guidelines, Spirometry is essential for establishing the diagnosis of asthma^[2]. Forced expiratory airflow measures are helpful in diagnosing and monitoring asthma and in assessing efficacy of therapy.

National and international asthma treatment guidelines have recently focused on control of asthma. They recommend different combinations of controllers for long term treatment of persistent asthma including addition of long-acting beta-2 agonists (LABA) to inhaled corticosteroid (ICS) therapy^[3,4]. NAEPP EPR 3 recommend combination

therapy for the majority of children with moderate to severe persistent asthma^[5]. Salmeterol and formoterol are highly selective, third generation LABAs that have been available for use since the early 1990s. Salmeterol and formoterol, however, differ in their pharmacological properties. One important difference is that the onset of action of formoterol is faster than that of salmeterol^[6,7]. Combination of budesonide and fomoterol as single inhaler have been shown to be safe and effective in treatment of asthma in children. According to the latest GINA guideline^[8], LABA's are primarily "used as add-on therapy in children older than 5 years whose asthma is insufficiently controlled by medium doses of inhaled glucocorticosteroids or as single-dose therapy before vigorous exercise".

In our study we tried to find out whether addition of LABA to inhaled steroids provides better asthma

control than when inhaled steroids are used alone in children with moderate persistent asthma.

Materials And Methods: The study was performed in Department Of Paediatrics, Sher-I-Kashmir Institute Of Medical Sciences Soura, Srinagar from december 2012 to january 2014 in children aged 6 to 15 years of age . Children with moderate persistant asthma (FEV1>60%) were included in the study. The children were divided into 2 groups. Both groups received fixed dose of inhalational steroids (budesonide 400micrograms/day). While as only one group received long acting beta agonists (formoterol 12 micrograms/day). Budesonide and formoterol was given as single inhaler. The Children were free to use short acting beta agonists (salbutamol). The children were assessed at 3 months using spirometry.

Statistical Tests: To analyse the data we have applied standard statistical tests like unpaired t test .

At Start:

Variable(FEV ₁)	Group 1	Group 2
Mean (MEDIAN)	78.4 (78)	78.7 (78)
SD	2.52	2.60
RANGE	75-84	75-84
P-VALUE	0.836	

Unpaired t test

At 3 Months:

Variable(FEV ₁)	Group 1	Group 2
Mean (MEDIAN)	83.5 (84)	81.7 (81.5)
SD	2.57	3.7
RANGE	76-87	77-88
P-VALUE	0.033	

Discussion:

In our study we tried to find out whether addition of LABA to inhaled steroids provides better asthma control than when inhaled steroids are used alone in children with moderate persistent asthma. Sixty children who met the inclusion criteria were included. They were randomly divided into two treatment groups. The two treatment options were compared by change in FEV1% from baseline over a period of 3 months. Budesonide/formoterol combination was significantly better in increasing

The result obtained have been discussed on 5% level of significance . The statistical software SPSS- v20 has been used.

Results: Total of 60 patients were included in the study and 30 patients were allocated to each group. The mean(±SD) age of the patients in our study was 9.3(±3.1) years in group 1 and 8.9(±2.6) years in group 2. In group 1 out of 30 patients , 21 were males and 9 were females. In group 2 out of 30 patients, 18 were males and 12 were females. The gender difference between the two groups was statistically insignificant (p>0.05). Budesonide/formoterol combination was significantly better in increasing FEV1% compared to budesonide alone. The mean FEV1% of patients in the Budesonide/formoterol group was 83.5±2.57 at 3 months of treatment compared to corresponding value of 81.7±3.7 in the budesonide alone group.

FEV₁% compared to budesonide alone. The mean FEV₁% of patients in the Budesonide/formoterol group was 83.5±2.57 compared to corresponding value of 81.7±3.7 in the budesonide alone group. The difference was statistically significant (p-value <0.05). Our results were consistent with study conducted by Zimmerman B . Zimmerman B^[9] et al. conducted a double-blind, placebo-controlled, randomized, parallel-group, multicenter study in 302 children aged 6-11 years with asthma not optimally treated with inhaled corticosteroids alone. Patients

continued with their existing dose of inhaled corticosteroids and in addition received placebo, formoterol 4.5 microg or formoterol 9 microg b.i.d., for 12 weeks (all delivered via Turbuhaler). Terbutaline was available as reliever medication. FEV(1) was significantly increased in formoterol groups compared with placebo, with no statistically significant difference between formoterol doses. Lung-function improvements compared with placebo were greater in the middle of the day. Formoterol provided sustained improvements in lung function and was well-tolerated in children with asthma suboptimally treated with inhaled corticosteroids alone. Bateman ED et al.^[10] evaluated the efficacy and safety of Symbicort (budesonide and formoterol in a single inhaler) with those of a high dose of the commonly used corticosteroid fluticasone propionate in patients with moderate persistent asthma. Clinic FEV(1) favoured budesonide/formoterol compared with fluticasone propionate ($p < 0.001$).

To conclude, addition of LABA to inhaled steroids in moderate persistent asthma provided better asthma control in the study population. LABA is mainly recommended to be used as add-on therapy for patients whose asthma is not controlled on low to high doses of inhaled corticosteroids. In our study, addition of LABA to moderate dose of inhaled steroids (budesonide=400microgram/day) resulted in greater improvement in FEV1%. So, combination therapy (steroid+LABA) is a better treatment option in children with moderate persistent asthma as compared to steroids alone.

Conclusion: In our study we found out that addition of long acting beta agonists to inhaled steroids provides better asthma control when compared to steroids alone.

Reference

1. Andrew H. Liu, Ronina A.Cover, Joseph D. Spahn, and Donald Y.M. Leung. Childhood asthma. Nelson 19th edition(vol 1):780-801.
2. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma-Summary Report 2007. J Allergy Clin Immunol. Nov 2007;120(5 Suppl):S94-138.
3. National Asthma Education and Prevention Program. *Guidelines for the Diagnosis and Management of Asthma: Expert Panel Report 3*. Bethesda, MD: National Institutes of Health, National Heart, Lung and Blood Institute; 2007.
4. Masoli M, Fabian D, Holt S, Beasley R; Global Initiative for Asthma (GINA) Program. Global Initiative for Asthma (GINA) program: the global burden of asthma: executive summary of the GINA Dissemination Committee report. *Allergy*. 2004;59(5):469–478.
5. Scott L, Nichols B, Choi Kwong KY, Morphew T, Jones CA. Longitudinal patterns of predominant asthma disease activity in pediatric patients enrolled in an asthma-specific disease management program. *J Asthma*. 2008;45(6):501–505.
6. van Noord JA, Smeets JJ, Raaijmakers JA, Bommer AM, Maesen FP. Salmeterol versus formoterol in patients with moderately severe asthma: onset and duration of action. *Eur Respir J*. 1996;9(8):1684–1688.
7. Palmqvist M, Persson G, Lazer L, Rosenborg J, Larsson P, Lötvall J. Inhaled dry-powder formoterol and salmeterol in asthmatic patients: onset of action, duration of effect and potency. *Eur Respir J*. 1997;10(11):2484–2489.
8. Global Strategy for Asthma Management and, Updated 2009; GINA.
9. Zimmerman B¹, D'Urzo A, Bérubé D. Efficacy and safety of formoterol Turbuhaler when added to inhaled corticosteroid treatment in children with asthma. *Pediatr Pulmonol*. 2004 Feb;37(2):122-7.
10. Bateman ED¹, Bantje TA, João Gomes M, Toumbis MG, Huber RM, Naya I, Eliraz A. Combination therapy with single inhaler budesonide/formoterol compared with high dose of fluticasone propionate alone in patients with moderate persistent asthma. *Am J Respir Med*. 2003;2(3):275-81.