COMPARISON OF THE EFFICACY OF SALMETEROL AND FORMOTEROL IN THE TREATMENT OF PATIENTS WITH SEVERE BRONCHIAL ASTHMA

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ABSTRACT

AIM

Formoterol and Salmeterol are long acting β2 agonists with duration of action greater than 12 hours making them suitable for twice daily treatment and for protection against nocturnal symptoms.

MATERIALS AND METHODS

PATIENTS

Forty two non-smoking patients admitted in the Department of Medicine, KMCH, Katihar (29 women, 13 men, mean age 45±2; mean FEV1; 61.8% of predicted) took part in the trial.

INCLUSION CRITERIA

All patients were receiving treatment with dosage of at least 1500 µg of an inhaled steroid (e.g. beclomethasone dipropionate, budesonide or fluticasone propionate) or regular oral steroid. All patients had an FEV1 80% of predicted. All patients reported daily asthma symptoms and were using their rescue inhaler on most days. All patients were at step 4 or 5 of the British Thoracic Society Guidelines.

EXCLUSION CRITERIA

All patients who had an exacerbation of asthma requiring change in maintenance treatment, patients with history of smoking.

RESULTS

The morning PEF was greater in patients receiving formoterol (mean increase 14.4 L/min) or salmeterol (mean increase 14.8 L/min) compared with those receiving placebo, but there was no difference between these treatments. There was no significant treatment effects for any of the secondary outcome variables (i.e. FEV1, FVC, mean evening PEF, mean daytime symptom score or night time symptom score).

CONCLUSION

LONG ACTING β 2 agonists salmeterol and formoterol improve morning PEF in patients with severe asthma, but there is no significant difference in efficacy between these two drugs.

KEYWORDS

Salmeterol, Formoterol, Efficacy, Severe Bronchial Asthma.

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INTRODUCTION: Inhaled β2 agonists are recognised as effective bronchodilators for the relief and prophylaxis of airway narrowing in the treatment of patients with asthma.[1,2,3]

- Formoterol and Salmeterol are long acting β2 agonists with duration of action greater than 12 hours making them suitable for twice daily treatment and for protection against nocturnal symptoms.[4,5,6,7]
- International guidelines on asthma management have recommended that they be added to the treatment of patients with symptoms not controlled with high-dose inhaled corticosteroids.[8,9,10,11]

STUDY OBJECTIVES:

- Several studies have demonstrated the superiority of Salmeterol and Formoterol to either regular treatment with Albuterol or placebo.[12,13] However, to date there have been few trials comparing the efficacy of Salmeterol and Formoterol in patients with severe asthma.

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- The present study compared the clinical efficacy of 4 weeks of treatment with inhaled formoterol (12 µg BD) or inhaled Salmeterol (50 µg BD) in patients with severe asthma whose symptoms were not controlled by treatment with high-dose inhaled or regular corticosteroid.

MATERIALS AND METHODS:

Patients: Forty two non-smoking patients admitted in the Department of Medicine, KMCH, Katihar (29 women, 13 men mean age 45±2; mean FEV1; 61.8% of predicted) took part in the trial.

Inclusion Criteria: All patients were receiving treatment with dosage of at least 1500 µg of an inhaled steroid (e.g. beclomethasone dipropionate, budesonide or fluticasone propionate) or regular oral steroid. All patients had an FEV1 <80% of predicted. All patients reported daily asthma symptoms and were using their rescue inhaler on most days. All patients were at step 4 or 5 of the British Thoracic Society Guidelines.

Exclusion Criteria: All patients who had an exacerbation of asthma requiring change in maintenance treatment, patients with history of smoking.

Lung Function Parameters at the End of Treatment Treatment:

Parameters	Placebo	Formoterol	Salmeterol
FEV1, L	1.75±0.13	1.96±0.14	1.91±0.13
FEV1, % Predicted	61.6±4.0	67.0±4.0	66.2±3.8
FVC, L	2.62±0.15	2.80±0.17	2.78±0.14
PEF, L/ min	333±16	363±17	357±16
Post Bronchodilator FEV1, L	2.02±0.13	2.11±0.15	2.01±0.13
Reversibility, %	1.73±2.8	8.6±2.6	6.9±1.6

Table 1

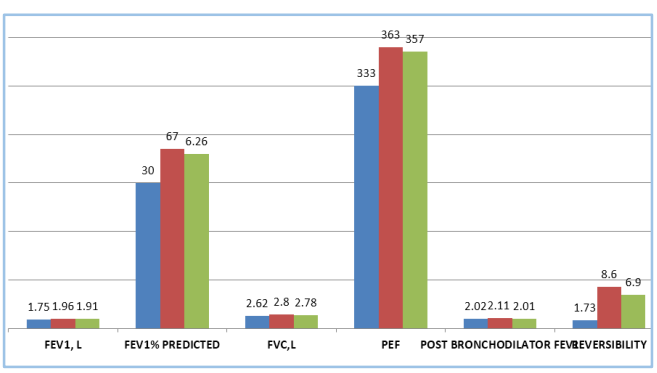

Fig. 1

Concomitant Medication Used:

Drug	Patient No.	Mean Dose, mg	Dose Range
Prednisolone	11	10	2.5-30
Prednisolone Plus Inhaled Steroid	11	1.6	1.0- 3.0
Inhaled Budesonide	15	2.0	1.6- 4.0
Inhaled Fluticasone	7	2.0	1.5-3.0
Inhaled Beclomethasone	9	1.8	2.0

Table 2

Summary of Data from Diary Cards for Last Two Weeks of Each Treatment Period.
Treatment:

Variable	Placebo	Formoterol	Salmeterol
Mean Evening PEF, L/min	334±16	342±18	341±16
Symptom Score			
Day Time	0.9±0.1	0.9±0.1	0.8±0.1
Night Time	0.6±0.1	0.6±0.1	0.4±0.1
Rescue Inhaler Use, Puffs/Day	5.0±0.7	4.1±0.9	3.6±0.6
Nebuliser Use, Nebulisers /Day	3.6±0.5	2.7±2.1	3.7±2.1

Table 3

RESULTS:

- The morning PEF was greater in patients receiving formoterol (mean increase 14.4 L/min) or salmeterol (mean increase 14.8 L/min) compared with those receiving placebo but there was no difference between these treatments.
- There was no significant treatment effects for any of the secondary outcome variables (i.e. FEV1, FVC, mean evening PEF, mean daytime symptom score or night time symptom score).

DISCUSSION: 42 non-smoker patients admitted in the indoor of the Department of Medicine of Katihar Medical College, Katihar (20 women and 22 men) during the year 2013 took part in the trial. Mean age of the patients was 45±2 years. All the patients had mean FEV1 61.8% predicted and all the patients were receiving treatment with dosage of at least 1500 mcg of an inhaled steroid. 11 patients were on prednisolone 10 mg, 11 patients were on prednisolone with inhaled steroid 1.6 mg, 15 patients were on inhaled budesonide 2.0 mg, 7 patients were on inhaled fluticasone 2.0 mg and 9 were on inhaled beclomethasone 1.8 mg. Various lung function parameters were studied at the end of 4 weeks of the scheduled trial. Morning PEF was

the primary parameter with which improvement was assessed.

It was 363±17 in the formoterol group whereas in the salmeterol group it was 357 L/min, which was lower than formoterol group. It was similar to a study conducted by JA Nightingale et al 2002. FEV1 was 1.96±0.14 L in the formoterol group where as it was 1.91±0.13 L in the salmeterol group.

Post bronchodilator FEV1 was 2.11±0.15 L and 2.01±0.13 in the formoterol and salmeterol group respectively. Reversibility of airway obstruction was around 8.26±2.6% and 6.9±1.6% in the formoterol and salmeterol group respectively. Data from diary cards for the last two weeks of each treatment period was noted. Mean evening PEF improvement was almost similar in both groups and so was the improvement in day and night time symptoms. Reduction in rescue inhaler use and nebulisation was almost similar in both groups. These findings were similar to a study conducted by JA Nightingale et al 2002.[14] M Palmqvist et al 1999.,[12] however, shows higher efficacy of Formoterol in various parameters. D. Verlovet et al [13] in the year 1998 demonstrated similar efficacy of salmeterol and formoterol.

CONCLUSION: LONG ACTING β2 agonists salmeterol and formoterol improve morning PEF in patients with severe asthma, but there is no significant difference in efficacy between these two drugs.

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