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Original Article

Comparison of Fluticasone Furoate Nasal Spray Versus Combined Oral Anti-Histamine and Anti-Leukotriene Therapy in Allergic Rhinitis

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Abstract

Background:.To compare intranasal Fluticasone furoate spray with oral anti-histamine and anti-leukotriene therapy in allergic rhinitis in terms of change in mean nasal symptoms score.

Methods: In this randomized control trial two groups were selected having 40 patients in each group. To group (A) cetirizine 10 mg plus montelukast 10 mg once daily was prescribed and to group (B) Fluticasone Furoate nasal spray 110 mcg once daily was prescribed for 6 months.Patients were called for follow up visits 4 times, 1st after 2 weeks then after every two months. On every follow-up visit .Total nasal symptoms scores were registered. Final outcome was measured on 4th visit.

Results: After six months follow up, the minimum total nasal symptom score was calculated as 0.50 and maximum total nasal symptom score was calculated as 2.88 with mean ± SD as 1.62 ± 0.69. There were 45% male and 55% were female. In group A, the mean ±SD was 2.21 ± 0.38 whereas in group B the mean ±SD was 1.04 ± 0.33. Significant difference was found between study groups for the AR having p-value 0.001.Significant difference of mean change in symptoms was found in both groups with p-value = 0.000 in age group < 40 years. In age group ≥ 40 years, significant difference of mean change in symptoms was found in both groups with p-value = 0.000.

Conclusion: Fluticasone furoate nasal spray was more effective than combined oral anti-histamines and leukotriene receptor antagonists in allergic rhinitis.

Key Words: Fluticasone Furoate, Cetirizine, Montelukast, Allergic Rhinitis

Introduction

Allergic rhinitis (AR) is type I hypersensitivity consisting of attacks of sneezing, rhinorrhoea, nasal blockade, and irritation of the eyes, nose, and palate. It is also characterized with postnasal drip, prickliness, cough and tiredness. When an individual is exposed to allergen he/she produces allergen-specific IgE. When this allergen is inhaled subsequently, IgE antibodies are linked on cell surface, which results in activation of cells and so symptoms of AR appear. [1] For satisfactory symptom control,mostly patients having allergic rhinitis need medications, supplement to avoidance of allergens. Patients extensively self-treat because mostly medicines become available without a prescription and the side effects of these antiallergy medicines are predominantly unwarranted sedation and anticholinergic sequels which are significant.[2] The existing encounter faced by doctors is to reassure that patients having acute AR are satisfactorily treated with medicines that do not trigger unnecessary side effects.[3] Atopic individuals usually react by producing allergen-specific IgE when exposed to an allergen. These antibodies get attached cells in respiratory mucosa to receptors on the mast cells and to basophils in the peripheral blood. Afterwards when the similar allergen is inhaled, IgE antibodies get connected to the cell surface by allergen, resulting in stimulation of the cell. Mast cells release preformed and granule-associated chemical mediators, which lead to allergic rhinitis symptoms.[4]

First line treatment for AR is oral anti-histamines[5].AR symptoms appear by an interaction between inhaled allergens and antibodies on mast cells which are positioned in upper airway tract.[6] It is probable to attain faster relief of symptoms by direct delivery of medicines to the nasal tissues. As a next line therapy oral anti-histamines and intranasal steroids, in combination, are usually presscribed.Intra-nasal steroids are suggested as the most appropriate medication for AR, widely covering symptoms of allergy, with the benefits of mono-therapy, such as better patient compliance, cost-effectiveness, and decreased side effects profile[7]. Specific medications include fluticasone propionate, mometasone furoate,

triamcinolone, beclomethasone, fluticasone furoate[8]. These drugs differ with regard to the bioavailability, frequency of doses, the spray device, and cost. Fluticasone propionate and Mometasone furoate have almost comparable and very low systemic bioavailability when administered intra-nasally even at high-dose.[9] Steroids which are used topically, alter the nasal environment in terms of Mucociliary clearance.[10]

Montelukast used with antihistamines such as cetirizine or loratadine has usually resulted in more effectiveness than when these medicines are used alone.[11] Montelukast has a favourable safety profile. Montelukast is effective in decreasing congestion and mucus production.[12] According to studies, Desloratadine-montelukast combination therapy causes decrease in nasal obstruction.[13] Pullerits and his colleagues assessed the effects of leukotriene antagonist,nasal steroids, and a grouping of antihistamine and leukotriene antagonist in the management of periodic allergic rhinitis. Result of their study showed mean symptoms score with Fluticasone propionate local nasal spray and combined antileukotriene and antihistamine as 1.1±0.5 and 1.5±0.4 respectively. They concluded that intranasal steroids are better than combined antileukotriene and antihistamine in controlling nasal symptoms in allergic rhinitis.[14]

AR Rhinitis is one of the commonest ailment round the world and also in Pakistan. According to a study, AR is most common allergic disease in Pakistan (24.62%) and in Pakistan it is very common in Islamabad and KPK.[15] In two studies of Gill MZ, he concluded that intra-nasal steroids improve mucociliary clearance and improve the patient quality of life.[16]

Patients and Methods

A randomized control trial with 80 patients was conducted at Capital Hospital Islamabad from December,2015 to December 2016 after approval from the ethical committee. Patients were selected with age range between 25 to 60 years and both male and female candidates. Patients having symptoms at screening, i.e., TNSS >6 with any one combination of nasal blockage, runny nose, nasal itching, sneezing and difficulty in sleep, were included. Exclusion criteria for this study was patients having non-allergic rhinitis, nasal blockage due to DNS or any other structural abnormalities, nasal polyps, hyper-sensitivity to intra-nasal steroids, cetirizine, Montelukast, known hypertensive, immuno-compromised, known diabetics and patients on oral steroids for any other condition. Patients (n=80) were divided into two groups. To group A (having 40 patients) plus montelukast 10 mg once and cetirizine 10 mg once daily daily was prescribed for 6 months and to group B (having 40 patients) Fluticasone Furoate nasal spray 110 mcg once daily (27.5 mcg per spray) i.e. 2 sprays in each nostril daily was prescribed for 6 months. Baseline nasal symptom score was calculated on first visit. Patients were called for follow up visits 4 times, 1st after 2 weeks then after every two months. On every follow-up visits total nasal symptoms scores were registered on questionnaire. Sum of the nasal symptoms score were calculated on every visit. Final outcome was measured on 4th visit i.e. after 6 months of starting therapy. Quantitative variables were mean score (at baseline, at 6 months and mean change)and age measured as mean ±SD. Mean symptoms score change was measured and was compared between two groups by independent sample t-test with level of significance of ≤0.05. Gender and age were controlled by stratification. Post stratification independent sample t-test was applied.

Results

Age range was from 25 years to 56 years (Mean ± SD: 38.34 ± 9.59 years). The minimum total nasal symptom score was calculated as 2.00 and maximum total nasal symptom score as 3.33 (Mean ± SD:2.59 ± 0.36). After six months follow up, the minimum total nasal symptom score was 0.50 and maximum total nasal symptom score as 2.88 with mean ±standard deviation as 1.62 ± 0.69. There were 36 (45%) male and 44 (55%) were female. There were forty patients in each study group (Table 1). In group A (cetirizine plus montelukast), the mean ± standard deviation was observed as 2.21 ±0.38 and in group B (Fluticasone Furoate nasal spray), the mean ± standard deviation was observed as 1.04 ± 0.33 (Table 2). Statistically significant difference was found by using independent sample t-test between study groups for the allergic rhinitis having p-value 0.001 (Table 3).By using independent sample t-test, significant difference of mean change in symptoms was found in both groups with p-value = 0.000 in males. In females, significant difference in symptoms was found in both groups with p-value = 0.000. Significant difference of mean change in symptoms was found in both groups with p-value = 0.000 in age group of < 40 years. In age group of > 40 years, significant difference of mean change in symptoms was found in both groups with p-value = 0.000 (Table 4 &5).

Table.1: Descriptive statistics (overall) (n=80)

	Minimum	Maximum	Mean	Std. Deviation
Age	25.00	56.00	38.34	9.59
Total Nasal Symptom Score	2.00	3.33	2.59	0.36
Total Nasal Symptom Score Follow up	.50	2.88	1.62	0.69

Table.2: Group-wise descriptive statistics

	Medicine Group	Mean	Std. Deviation
Age	Group A	38.33	9.66
	Group B	38.35	9.64
Total Nasal Symptom Score	Group A	2.66	.38
	Group B	2.54	.33
Total Nasal Symptom Score Follow up	Group A	2.21	.38
	Group B	1.04	.33

Table.3 Difference of mean symptom score between study groups

Medicine Group	Mean	Std. Deviation	P-Value
Group A	2.21	0.38	0.001
Group B	1.04	0.33	

Independent t-test applied

Table.4 Stratification of mean change in symptoms score with respect to gender

Gender	Medicine Group	n	Mean + Std. Deviation	P-value
Male	Group A	18	2.22 + 0.38	0.000
	Group B	18	1.18 + 0.34	
Female	Group A	22	2.19 + 0.39	0.000
	Group B	22	0.93 + 0.29	

Independent t-test applied

Table.5 Stratification of mean change in symptoms score with respect to age

Age	Medicine Group	n	Mean + Std. Deviation	P-value
< 40 Years	Group A	20	2.23 + 0.38	0.000
	Group B	20	1.07 + 0.32	
> 40 Years	Group A	20	2.18 + 0.39	0.000
	Group B	20	1.02 + 0.36	

Independent t-test applied

Discussion

Allergic Rhinitis (AR) is IgE mediated inflammation consisting of attacks of rhinorrhoea, sneezing, nasal obstruction and itching of the nose, eyes and palate. It is characterized by postnasal drip, irritability,cough, and lethargy.[15,6,13]

Research done by Varshney et al. showed that patients (58% males median age 32 years) with symptom duration of 24 months chose fluticasone propionate vs ciclesonide nasal spray (55.41% vs. 25.68%, p=0.007) and also with regard to calming feel, qualities of scent and nasal irritation. It was found that there was no statistically significant difference in immediate effectiveness.[7] Berger et al. compared 220 microgram intranasal aqueous triamcinolone acetonide (TAA AQ) daily with 200 microg. fluticasone propionate (FP) .Decreases in patients symptoms and total nasal symptom score were statistically significant as compared to baseline and were equivalent between treatments. Intranasal fluticasone propionate and aqueous triamcinolone acetonide were similarly effective in relieving symptoms of seasonal allergic rhinitis.[17]

In a study by Baroody et al total nasal symptom score was lower with the combination matched with treatment with placebo and oxymetazoline alone (p = .04)over the 4 weeks of treatment. When acoustic rhinometry was competed between the groups, the combination showed significantly higher nasal volume (p< .03) compared with both placebo and oxymetazoline alone at the end of 4 weeks of treatment. Quality of life data revealed no significant differences between the groups. Peak flow showed a non-significant progress with the groups on fluticasone furoate. Rhinitis medicamentosa was not evident in the study.[18]Result from a previous study showed that intranasal steroids are better than combined antileukotriene and antihistamine in controlling nasal symptoms in allergic rhinitis.[14] In another research, Azelastine showed a statistically significant improvement in TNSS (Total nasal symptom score)as compared to placebo at all time points from 15 minutes through 6 hours post dose. Azelastine, loratadine and cetirizine reduced TNSS as compared to placebo with an onset of action of 15 (p < 0.001), 60 (p = 0.015), and 75 (p = 0.034) minutes, respectively[19].In previous research of Gill et al. the measures of basophil, eosinophil and neutrophil counts and mucociliary clearance were significantly superior in mometasone furoate than in placebo managed patients. Correspondingly, within-treatment statistically significant improvements were formed by

mometasone furoate but not by placebo sprays for the levels of eosinophilic cationic protein, albumin and tryptase, NAR, and odour documentation. Significant positive correlations were established between NAR and nasal stuffiness and between eosinophils, neutrophils and basophils, and both eosinophilic cationic protein and albumin.[20]

Conclusion

Fluticasone furoate nasal spray is more efficient than combined oral anti-histamines and leukotriene antagonists in treating allergic rhinitis.

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