Efficacy of Loratadine Versus Fexofenadine in Treatment of Allergic Rhinitis

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ABSTRACT

Background: Allergic rhinitis is the disease mediated by immunoglobulin E. Anti-histamines are the main therapeutic option. Fexofenadine is the selective histamine H1-receptor antagonist that does not cross the blood brain barrier. Loratadine is the tri-cyclic anti-histamine, which acts as a selective inverse agonist of peripheral histamine H1-receptors. Both these anti-histamines are second generation.

Objective: To compare the efficacy of loratadine versus fexofenadine in relieving the symptoms of allergic rhinitis.

Material and Methods: This Randomized Controlled Trial was conducted at the Department of ENT and Head and Neck Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from April to October 2020. Sample size of 270 cases (135 patients in each group), were recruited by applying non-probability, consecutive sampling technique. Patients aged from 12 to 60 years, both genders, with allergic rhinitis were included and divided randomly into two groups by lottery method. Group 1 received Loratadine 10 mg once daily for two weeks. Group 2 received fexofenadine 60 mg twice daily for two weeks. Total "rhinitis symptom severity scores" was estimated at baseline and two weeks after treatment. Efficacy was determined on the basis of Improvement score of 61-100%. All the information was recorded on proforma. Data was analysed in SPSS v. 22.

Results: In this study, the mean age of patients was 33 ± 2.11 years in loratadine group while 30 ± 1.26 years in fexofenadine group. There were 42 males and 58 females. Efficacy of treatment was achieved in 92% cases with loratadine while in 85% cases with Fexofenadine ($p > 0.05$).

Conclusion: Loratadine showed better therapeutic response than fexofenadine, however the difference was insignificant.

Key Words: Loratadine, Fexofenadine, Allergic rhinitis

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INTRODUCTION

Allergic rhinitis is the disease mediated by immunoglobulin E. it is considered that it can occur due to exposure of patients to several allergens like dust, litter, insects, dust mites, animal dander, mold, or pollen. Patients mostly present with symptoms like rhinorrhea, nasal obstruction or congestion & pruritus.^{1,2} All over the world, allergic rhinitis is a most prevalent allergic problem. It disturbs around 18-40% of general population and mostly found in young adults. It is also very common in pediatrics age group.³⁻⁵ Anti-histamines are the main option for treatment of allergic rhinitis. These are recommended for all allergy types. As compared to the previous anti-histamines, new anti-histamines have rapid onset of action i.e. within few minutes to hours. These are easy to apply, and are highly effective. Mostly, these anti-histamines are anti-cholinergic free and cause no side effects and are comparatively more safe than first generation anti-histamines, even in older population.⁶

The efficiency of new H1-receptor antagonists to resolve the symptoms of seasonal allergic rhinitis are well-known. Fexofenadine is the selective histamine H1-receptor antagonist that does not cross the blood brain barrier.⁷⁻⁹ Loratadine is the tri-cyclic anti-histamine, which acts as a selective inverse agonist of peripheral histamine H1-receptors. Both these anti-histamines are second generation. Results of a study showed that efficacy of loratadine were significantly greater than fexofenadine 89.4% versus 78.3%. It was proposed that loratadine can provide significantly better relief from symptoms as compared to fexofenadine in cases who failed to respond to the initial treatment.¹⁰⁻¹² In another study, Fexofenadine produced significantly greater percentage suppression of the overall allergic response compared with placebo and loratadine (43.1% versus 10.0% and 15.2% respectively; $p < 0.001$). Loratadine was statically no different from placebo in terms of allergic response suppression.¹³⁻¹⁵

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In Pakistan, evidence regarding the prevalence and pharmacological treatment is lacking and very limited comparative trials are available on new anti-histamines for allergic rhinitis. Our study will help to select a better drug in both short and long term beneficial effects in the -management of allergic rhinitis in our population, as the efficacy of both drugs i.e. loratadine and fexofenadine have been found to be variable in literature as

mentioned above. So our rationale was to generate our own data and then compare the efficacy of both drugs such as loratadine and fexofenadine for allergic rhinitis.

MATERIAL AND METHODS

This Randomized Controlled Trial was conducted after getting the permission to conduct the study from Hospital ethical Committee, at the Department of ENT and Head and Neck Surgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from 15th April to 30th October 2020. Sample size was 270 cases (135 patients in each group)¹, which was calculated by using 5% significance level, 89.4% success rate of loratadine and 78.3% success rate of fexofenadine, 80% power of test, under WHO formula for sample size determination, which were divided into two groups. Patient were recruited in the study by applying non-probability, consecutive sampling technique as we followed a strict selection criterion which is as follows: Patients aged from 12 to 60 years, both genders, presenting with allergic rhinitis. Allergic rhinitis was defined as an Ig-E mediated response of nasal mucosa to exposure to allergens which results in nasal congestion, sneezing, pruritus (itchy nose, palate, throat, eyes) and rhinorrhea (watery runny nose) diagnosed by detailed history and physical examination of nose (showing pale and oedematous mucosa, swollen turbinate), eyes (lid oedema, cobble stone appearance) and pharynx. Patients having nasal polyps or any systemic disease or lung disease like bronchial asthma, pregnancy and lactating mothers, using nasal, inhaled corticosteroids or cromolyn within 2 weeks of trial, patients escalating doses of immunotherapy during the trial were excluded from the study. Informed consent was taken. Patients were divided randomly into two groups by lottery method. Group 1 comprised of 135 patients who had taken Loratadine 10 mg once daily for two weeks. Group 2 comprised of 135 patients who had taken fexofenadine 60 mg twice daily for two weeks. In all patients baseline measurements were obtained before initiation of treatment. Ratings were done two times a day, before taking medication and were based on symptoms. Total "rhinitis symptom severity scores" was estimated as sum of individual scores (maximum = 8 / symptom). The response to the treatment of rhinitis symptoms was rated by using improvement score i.e. complete relief (1), marked relief (2), moderate relief (3), slight relief (4), or treatment failure (5). Efficacy was

determined on the basis of Improvement score of 61-100%. Lower the score, more successful was the drug. Data was collected at baseline (before treatment) and after 2 two weeks of treatment. All the information was recorded on proforma. All the patients were examined by Dr. Mubasharullah Jan who has passed FCPS ENT in 2016 and is working as ENT consultant till date. Data was analysed in SPSS v. 22. Chi square test was used to compare the efficacy in both groups. P-value 0.05 was considered significant.

RESULTS

In this study, a total number of 270 patients were included to determine the efficacy of fexofenadine versus loratadine in treatment of allergic rhinitis and the results were analyzed as:

The mean age of patients in loratadine group was 33 ± 2.11 years. The mean age of patients in Fexofenadine group was 30 ± 1.26 years. In loratadine group, there were 55 (41%) males and 80 (59%) females. In Fexofenadine group, there were 57 (42%) males and 78 (58%) females. In Loratadine group, mean duration of allergy was 5 ± 2.34 . In Fexofenadine group, mean duration of allergy was 6 ± 2.99 .

Pretreatment assessment of symptoms like congestion, sneezing, rhinorrhea and pruritis was analyzed between the two groups on 1st visit as given in Table 1. Post treatment assessment on 2nd visit was analyzed as in Loratadine Group, congestion was found in 22(16%) patients and was absent in 113(84%), Sneezing was found in 28(21%) patients and was absent in 107(79%), Pruritus was found in 1(1%) patients and was absent in 134(99%), Rhinorrhea was found in 24(18%) patients and was absent in 111(82%). Where as in Fexofenadine Group, congestion was found in 30(22%) patients and was absent in 105(78%), Sneezing was found in 39(29%) patients and was absent in 99(71%), Pruritus was found in 3(2%) patients and was absent in 132(98%), Rhinorrhea was found in 36(27%) patients and was absent in 99(73%). Table 1

On last visit, complete relief was observed in 68 (50%) patients with loratadine and in 61 (45%) patient with fexofenadine, marked relief was found in 20(15%) patients with loratadine and in 18(13%) with fexofenadine, moderate relief was found in 23(17%) patients with loratadine and in 20 (15%) with fexofenadine, slight relief was found in 13(10%) patients with loratadine and in 16

with fexofenadine while treatment was failed in 11(8%) patients with loratadine and in 20(15%) cases with fexofenadine. The difference was insignificant ($p>0.05$). Table 2

Drug's efficacy among 270 patients was analyzed as Loratadine was effective in 124(91.9%) patients while Fexofenadine was effective in 115(85.2%) patients. The difference was insignificant ($p>0.05$). Table 3

Table 1. Assessment before and after treatment

Symptoms	LORATADINE		FEXOFENADINE	
	Pre-treatment	Post-treatment	Pre-treatment	Post-treatment
Congestion	95(70%)	22(16%)	97(72%)	30(22%)
Sneezing	51(38%)	28(21%)	49(36%)	39(29%)
Pruritus	4(3%)	1(1%)	7(5%)	3(2%)
Rhinorrhea	74(55%)	24(18%)	81(60%)	36(27%)

Chi square test was applied in which P value 0.053

Table 2. Improvement in symptoms

Improvement	LORATADINE	FEXOFENADINE
Complete Relief (81-100%)	68(50%)	61(45%)
Marked Relief (61-80%)	20(15%)	18(13%)
Moderate Relief (41-60%)	23(17%)	20(15%)
Slight Relief (21-40%)	13(10%)	16(12%)
Treatment Failure (0-20%)	11(8%)	20(15%)

Chi square test was applied in which P value 0.4602

Table 3. Efficacy of treatment

Efficacy	LORATADINE	FEXOFENADINE
Achieved	124(91.9%)	115(85.2%)
Not achieved	11(8.1%)	20(14.8%)
Total	135	135

p-value = 0.0858 (Insignificant)

DISCUSSION

Allergic rhinitis is associated with nasal & non-nasal symptoms, which are very annoying and have a negative effect on physical, psychological and social health. Allergic rhinitis is also responsible for the loss of productivity and sleep disorders, it can also weaken the learning. It is also associated with > 2 million absent school days every year. The financial penalties of allergic rhinitis are significant.^{9, 16-18}

Anti-histamines are thought to be the first-line therapy to manage patients of allergic rhinitis. To cure the symptoms, patients of allergic rhinitis self-medicate mostly by using over the counter anti-histamines.¹⁹ Loratadine is a non-sedating, but has poor infiltration through the blood-brain barrier, causing in promising acceptable central nervous system profile. It is mostly directed for the relief of allergic rhinitis symptoms including both;

Nasal & non-nasal. Fexofenadine is the metabolite of terfenadine. It is also non-sedating, H₁-receptor antagonist, which is directed twice a day for relief of allergic rhinitis symptoms.²⁰⁻²² So we conducted this trial to compare the loratadine and fexofenadine in decreasing the symptoms of allergic rhinitis.

Our study shows that after 2nd visit, Loratadine Group complete relief was found in 50% patients, marked relief was found in 15% patients, moderate relief was found in 17% patients, slight relief was found in 10% patients and treatment was failed in 8%. Where as in Fexofenadine Group complete relief was found in 45% patients, marked relief was found in 13% patients, moderate relief was found in 15% patients, slight relief was found in 12% patients and treatment was failed in 15%. According to which Loratadine was effective in 92% patients while Fexofenadine was effective in 85% patients.

Loratadine showed the significantly better improvement in response to the therapy as compared to the fexofenadine. Patients' satisfaction with loratadine after 2nd visit was significantly better as compared to fexofenadine ($p < 0.05$). The results of this randomized, double-blind trial showed that the efficacy of loratadine & fexofenadine in relieving the symptoms of seasonal allergic rhinitis is high and also confirmed the results of previous trials. While several published trials determined insignificant differences between both agents, while results of few trials favored either loratadine or fexofenadine, though not reliable.^{23,24}

Our trial determined that although, loratadine showed significantly better ($p < 0.05$) symptoms relief after initiation of treatment and earlier relief of symptoms as compared to fexofenadine. Loratadine also provided significantly greater improvement in symptoms within the first 3 treatment days as compared to fexofenadine.

CONCLUSION

Loratadine showed better therapeutic response than fexofenadine, however the difference was insignificant. But now, we can recommend Loratadine for cure of allergic rhinitis in adult population, as we have got the more effective drug for allergic rhinitis. It would help to improve the quality of life of patients.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Jan MA, Khan S: Concept and design of study, Collection of data, statistical analysis

Iqbal M, Khan A: Writing of manuscript, critical review of manuscript

Fawad SZ: Analysis and interpretation of data, statistical analysis

Ahmad S: Data collection, bibliography

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.