DOI: https://doi.org/10.53350/pjmhs20231709324

ORIGINAL ARTICLE

Comparative Efficacy of Antiallergics and Quality of Life in Patients with Allergic Rhinitis

MUHAMMAD MALOOK BUGTI[1], ATA UR REHMAN[2], AFTAB HUSSAIN ABRO[3], MUHAMMAD AITMAUD UDDOLAH KHAN[4], SYED GHULAM MURTAZA[5], FARAZ SALEEM[6]

[1]*Assistant Professor, Department of Community Medicine, Jhalawan Medical College Khuzdar*
[2]*Associate Professor, Department of Pharmacology, Shaheed Mohtarma Benazir Bhutto Medical College, Lyari*
[3]*Assistant Professor, Department of Community Medicine, Shaheed Mohtarma Bainazeer Bhutto medical college, Karachi*
[4]*Associate Professor, Department of Pharmacology, Liaquat National Medical College, Karachi*
[5] *Specialist Family Physician and Diabetologist, Doctors Plaza, Opposite, Ayub Teaching Hospital, Abbottabad*
[6]*Assistant Professor, Department of Pharmacology and Therapeutics, Baqai Medical College, Karachi*
Correspondence to: Ata ur Rehman, Email: hkdr_ata@yahoo.com

ABSTRACT

Background: Allergic rhinitis can substantially affect patients' health-related quality of life, as its impact extends beyond nasal complaints to include symptoms such as headache and fatigue. Assessment of allergic rhinitis in clinical research has traditionally focused on symptom severity, nasal airflow, and findings from nasal cytological examination. Evaluating clinical outcomes should therefore extend beyond the control of physical symptoms to include improvements in daily functioning and overall well-being. In this context, the present study was designed to evaluate and compare the therapeutic effectiveness and safety profiles of three antihistamine agents (cetirizine, loratadine, and astemizole) in patients with allergic rhinitis and their effect on health-related quality of life.

Material and Methods: A prospective cohort study was conducted at the outpatient department of the Ear, Nose, and Throat (ENT) unit at a tertiary care hospital of Karachi, from November 2022 to May 2023. Eligible participants were then randomly assigned to one of three treatment groups, with 30 patients allocated to each group according to the medication prescribed: Group I: Cetirizine 10 mg orally once daily, Group II: Loratadine 10 mg orally once daily, Group III: Astemizole 10 mg orally once daily. Medication supplies and recording cards were renewed during weekly follow-up visits throughout the six-week study period. The perceived improvement in symptoms was assessed using a visual analogue scale (VAS) ranging from 0 to 10. Data was analyzed by using Statistical Package for Social Science (SPSS) version-22.

Results: The reduction in symptoms was statistically significant in all three groups. Cetirizine provided greater relief from sneezing than loratadine ($p<0.05$). Loratadine showed better control of sneezing than astemizole ($p<0.05$). A greater reduction in nasal obstruction was observed among patients receiving cetirizine compared with those treated with loratadine and astemizole, with the differences being statistically significant ($p<0.05$). In terms of ocular symptoms, significant differences were observed in comparisons between the cetirizine and astemizole groups and between the loratadine and astemizole groups. Although this adverse effect was reported in each group, it was most pronounced among patients receiving cetirizine, followed by astemizole and loratadine.

Conclusion: The findings of this study indicate that all three antihistamines, cetirizine, loratadine, and astemizole, were generally well tolerated, with relatively few adverse effects reported during treatment. However, cetirizine showed better overall symptom control than loratadine and astemizole, providing greater relief from the symptoms of allergic rhinitis.

Keywords: Allergic rhinitis, Cetirizine, Loratidine, Astemizole

INTRODUCTION

Allergic rhinitis can substantially affect patients' health-related quality of life, as its impact extends beyond nasal complaints to include symptoms such as headache and fatigue. The combined burden of these manifestations may interfere with daily activities, emotional well-being, work performance, and social interactions, sometimes resulting in considerable psychological distress. Despite these consequences, the overall impact of allergic rhinitis is not always adequately appreciated in clinical practice. Therefore, effective management should involve identifying each patient's specific symptoms and functional limitations and selecting treatment accordingly. The use of sedating antihistamines may further compromise daily functioning by adversely affecting alertness, cognitive performance, and productivity.

Management of allergic rhinitis involves several approaches, including allergen avoidance, short-term use of decongestants, oral or intranasal antihistamines, intranasal cromoglycate, intranasal corticosteroids, and allergen immunotherapy. Histamine H1-receptor antagonists have long been used in the management of allergic conditions and remain an important therapeutic option[1,2]. Their role in allergic rhinitis includes symptom control and, depending on the agent and clinical circumstances, preventive treatment. However, first-generation antihistamines are associated with limitations, particularly sedation and anticholinergic adverse effects[3, 4]. Second-generation agents, including cetirizine and loratadine, have demonstrated efficacy in relieving symptoms of seasonal allergic rhinitis[5]. Astemizole has also been investigated for symptom control, particularly in patients requiring prolonged treatment; however, its use is restricted because of the risk of serious cardiac arrhythmias. Consequently, antihistamine selection should be guided by clinical efficacy, safety, patient characteristics, and current treatment recommendations[6].

Assessment of allergic rhinitis in clinical research has traditionally focused on symptom severity, nasal airflow, and findings from nasal cytological examination. Although these parameters provide valuable information about therapeutic response, they do not fully capture the effect of treatment on patients' everyday experiences. Evaluating clinical outcomes should therefore extend beyond the control of physical symptoms to include improvements in daily functioning and overall well-being. In this context, the present study was designed to evaluate and compare the therapeutic effectiveness and safety profiles of three antihistamine agents (cetirizine, loratadine, and astemizole) in patients with allergic rhinitis and their effect on health-related quality of life.

MATERIAL AND METHODS

A prospective cohort study was conducted at the outpatient department of the Ear, Nose, and Throat (ENT) unit at a tertiary care hospital of Karachi for the duration of six months, from November 2022 to May 2023. Study got ethical approval from the concerned institute and written informed consent was obtained from every participant before enrollment. Sample size was calculated using OpenEpi calculator and was 90, keeping 5% margin of error, 95% confidence interval and 24.6% frequency of

Received on 15-07-2023
Accepted on 15-09-2023

allergic rhinitis in Pakistan. Study participants included patients of both sexes, aged 16–45 years, who presented with allergic rhinitis. Individuals with bronchial asthma, cutaneous allergic disorders, glaucoma, prostatic hyperplasia, atrophic rhinitis, steroid dependence, or an active upper respiratory tract infection were excluded from the study. Women of childbearing potential and individuals unable to comprehend or complete the study questionnaire were also excluded. Participants were selected randomly from the eligible outpatient population.

Following initial eligibility screening, patients were required to report at least two of the following symptoms to qualify for participation: nasal congestion, rhinorrhea, nasal itching, and sneezing. Eligible participants were then randomly assigned to one of three treatment groups, with 30 patients allocated to each group according to the medication prescribed.

- Group I: Cetirizine 10 mg orally once daily.
- Group II: Loratadine 10 mg orally once daily.
- Group III: Astemizole 10 mg orally once daily.

Clinical evaluation included the assessment of sneezing, nasal obstruction, ocular watering, and sedation. Baseline clinical findings and symptoms were documented before treatment initiation. Patients were asked to document their daily experiences, including nasal and ocular manifestations, practical difficulties associated with the condition, and other related symptoms. Medication supplies and recording cards were renewed during weekly follow-up visits throughout the six-week study period. The perceived improvement in symptoms was assessed using a visual analogue scale (VAS) ranging from 0 to 10. A score of 0 represented no symptomatic relief, whereas a score of 10 indicated complete relief. Weekly symptom scores and assessments of overall well-being were documented for all three treatment groups and compiled for comparative analysis. Treatment tolerability was evaluated by recording potential adverse effects, including sedation, headache, and dry mouth. These observations were used to compare the clinical response and safety profiles of the three antihistamine regimens.

Data was analyzed by using Statistical Package for Social Science (SPSS) version-22. Quantitative results were summarized as mean ± standard deviation (SD). Differences among the three treatment groups were evaluated using one-way analysis of variance, ANOVA with Post-Hoc-Tuckey test. A p-value less than 0.05 was considered as statistically significant.

RESULTS

Ninety patients were enrolled in the study, and all completed the six-week treatment period. Data from all participants were included in the final analysis. Improvement in nasal symptoms was observed in all three treatment groups during the study, as reflected by changes in the mean visual analogue scale (VAS) scores (Table 1). The reduction in symptoms was statistically significant in all three groups.

Table 1 Effect of Cetrizine (Group I), Loratidine (Group II) and Astemizole (Group III) on symptoms of allergic rhinitis over a period of 6 weeks

	Mean ± SD Visual Analogue Scale (VAS) Scores			p-value
	Group I (n= 30)	Group II (n= 30)	Group III (n= 30)	
Effect on sneezing				
1st week	2.5 ± 0.4	2.7 ± 0.5	2.1 ± 0.3	≤0.05
6th week	8.1 ± 0.2	7.6 ± 0.3	6.3 ± 0.1	
Effect on nasal obstruction				
1st week	4.9 ± 0.2	4.3 ± 0.2	3.5 ± 0.5	≤0.01
6th week	9.1 ± 0.1	8.5 ± 0.4	7.8 ± 0.3	
Effect on watering of eyes				
1st week	3.1 ± 0.3	2.9 ± 0.3	2.5 ± 0.4	≤0.01
6th week	9.6 ± 0.3	8.9 ± 0.3	7.0 ± 0.4	
Effect on sedation				
1st week	2.9 ± 0.2	1.5 ± 0.3	2.1 ± 0.2	≤0.05
6th week	3.5 ± 0.3	2.1 ± 0.1	2.9 ± 0.3	
Effect on well-being of the patient				
1st week	2.5 ± 0.4	3.6 ± 0.5	1.6 ± 0.2	≤0.05
6th week	7.9 ± 0.3	7.8 ± 0.2	4.2 ± 0.3	

Cetirizine provided greater relief from sneezing than loratadine ($p<0.05$), while its superiority over astemizole was observed throughout the six-week study period ($p<0.05$). Loratadine also showed better control of sneezing than astemizole ($p<0.05$).

A greater reduction in nasal obstruction was observed among patients receiving cetirizine compared with those treated with loratadine and astemizole, with the differences being statistically significant ($p<0.05$). In terms of ocular symptoms, significant differences were observed in comparisons between the cetirizine and astemizole groups and between the loratadine and astemizole groups.

Sedation was assessed during treatment with all three antihistamines. Although this adverse effect was reported in each group, it was most pronounced among patients receiving cetirizine, followed by astemizole and loratadine.

DISCUSSION

Allergic rhinitis is frequently encountered in ENT practice and develops following exposure to allergens in susceptible individuals. This exposure triggers the release of histamine and other inflammatory mediators, which produce the characteristic symptoms of the disease. Patients commonly present with sneezing, nasal discharge, nasal blockage, itching of the nose and throat, redness of the eyes, and excessive tearing. The severity of these symptoms varies from mild discomfort to considerable interference with daily activities. Apart from physical symptoms, allergic rhinitis can also affect sleep, work performance, social activities, and the overall quality of life of affected individuals.

Several medications are available for symptomatic treatment, including antihistamines, nasal decongestants, and antipyretics. Many of these preparations can be obtained over the counter and are frequently used without medical consultation. Among these medications, H1 antihistamines remain an important treatment option because of their ability to relieve common allergic symptoms. Although first-generation antihistamines are effective, their use is often associated with drowsiness and anticholinergic effects, which may interfere with daily functioning. Second-generation antihistamines are generally preferred because they produce fewer such adverse effects and are better tolerated. Despite the availability of different treatment options, the choice of an appropriate medication remains important, particularly when balancing symptom control against unwanted effects.

The present study compared three antihistamines, namely cetirizine, loratadine, and astemizole, in patients with allergic rhinitis. Treatment response was assessed over six weeks by monitoring common symptoms, including sneezing, nasal obstruction, watering of the eyes, sedation, and overall well-being. The visual analogue scale (VAS) was used to record the severity of symptoms and the degree of improvement following treatment[7].

In the present study, all three medications produced a statistically significant improvement in allergic rhinitis symptoms. However, the degree of relief varied among the treatment groups. Cetirizine showed the greatest improvement in sneezing, followed by loratadine and astemizole. During the first two weeks, cetirizine and loratadine showed comparable effectiveness, whereas during the subsequent four weeks, cetirizine provided significantly greater relief from sneezing than loratadine ($p<0.05$). These results are consistent with earlier studies reporting the beneficial effects of cetirizine in controlling allergic symptoms[8, 9].

A similar pattern was observed for nasal obstruction, where cetirizine produced greater symptomatic relief than the other two medications. The difference between cetirizine and loratadine was statistically significant ($p<0.05$), whereas the comparison between loratadine and astemizole did not show a significant difference. In a comparative study, Jobst et al. also reported that cetirizine was more effective than placebo in improving several symptoms of allergic rhinitis, including sneezing, nasal obstruction, nasal discharge, nasal itching, and ocular itching[10].

Regarding ocular symptoms, cetirizine and loratadine provided almost similar relief from watering of the eyes, and both appeared more effective than astemizole. This observation is in agreement with previous research demonstrating the beneficial effects of cetirizine and loratadine in controlling the symptoms of allergic rhinitis and associated conjunctivitis. Dubuske (1995) also reported better symptom control with cetirizine than with astemizole. Similarly, Ilaria et al. (1994) found that loratadine was more effective than placebo and had a faster onset of action than astemizole[11-13].

In addition to clinical symptoms, the study assessed changes in absolute eosinophil count and eosinophil numbers in nasal smears between the first and sixth weeks of treatment. At the end of the study, the greatest reduction in absolute eosinophil count was observed in the cetirizine group. However, cetirizine and loratadine produced comparable reductions in nasal smear eosinophil counts. These findings are supported by previous studies showing that antihistamine treatment can reduce inflammatory cell infiltration in allergic rhinitis. Earlier reports have also demonstrated reductions in eosinophil and neutrophil counts following cetirizine treatment, while both cetirizine and loratadine have been associated with a decrease in eosinophilic infiltration[14-15].

Overall clinical improvement was also greater among patients receiving cetirizine, as reflected by higher mean patient satisfaction scores compared with loratadine and astemizole. Patients treated with cetirizine also reported better improvement in their quality of life. Bousquet demonstrated that six weeks of cetirizine treatment significantly increased the proportion of days without rhinitis symptoms compared with placebo ($p<0.0001$). The study further supported the role of cetirizine in improving the quality of life of patients suffering from perennial allergic rhinitis[16].

With regard to adverse effects, sedation was reported most frequently among patients receiving cetirizine. However, despite this effect, patients did not report a decline in work performance. Some participants even described better social interaction and fewer work-related absences during treatment. Nightingale (1996) also reported that cetirizine could produce drowsiness and anticholinergic effects, although these effects were less pronounced than those associated with first-generation antihistamines. Headache was reported more frequently with loratadine, whereas somnolence was the most commonly observed adverse effect with cetirizine.

Taken together, the findings of this study suggest that cetirizine provided greater overall symptomatic relief than loratadine and astemizole, particularly for sneezing and nasal obstruction. Its effects on ocular symptoms and nasal eosinophil counts were comparable to those of loratadine. Although sedation was more noticeable with cetirizine, it did not appear to adversely affect the reported work performance of patients.

CONCLUSION

The findings of this study indicate that all three antihistamines, cetirizine, loratadine, and astemizole, were generally well tolerated, with relatively few adverse effects reported during treatment. However, cetirizine showed better overall symptom control than loratadine and astemizole, providing greater relief from the symptoms of allergic rhinitis.

REFERENCE

1. Swaab DF, Kreier F, Lucassen PJ, Salehi A, Buijs RM. Histamine receptors, agonists, and antagonists in health and disease. The Human Hypothalamus: Middle and Posterior Region. 2021 Jul 1;180:377.
2. Nieto A, Nieto M, Mazón Á. The clinical evidence of second-generation H1-antihistamines in the treatment of allergic rhinitis and urticaria in children over 2 years with a special focus on rupatadine. Expert opinion on pharmacotherapy. 2021 Mar 4;22(4):511-9.
3. Nayak AS, Berger WE, LaForce CF, Urdaneta ER, Patel MK, Franklin KB, Wu MM. Randomized, placebo-controlled study of cetirizine and loratadine in children with seasonal allergic rhinitis. InAllergy and Asthma Proceedings 2017 May 1 (Vol. 38, No. 3, pp. 222-230). OceanSide Publications, Inc.
4. Parisi GF, Leonardi S, Ciprandi G, Corsico A, Licari A, Del Giudice MM, Peroni D, Salpietro C, Marseglia GL. Antihistamines in children and adolescents: A practical update. Allergologia et immunopathologia. 2020 Nov 1;48(6):753-62.
5. Snoeck E, Van Peer A, Heykants J. Pharmacokinetic-Pharmacodynamic Correlations of Antihistamines. InHandbook of Pharmacokinetic/Pharmacodynamic Correlation 2019 Jun 4 (pp. 275-298). CRC Press.
6. Hossenbaccus L, Linton S, Garvey S, Ellis AK. Towards definitive management of allergic rhinitis: best use of new and established therapies. Allergy, Asthma & Clinical Immunology. 2020 May 27;16(1):39.
7. Rotiroti G, Dziadzio M, Radcliffe M. Antihistamines for the treatment of allergic rhino-conjunctivitis. Current Treatment Options in Allergy. 2016 Mar;3(1):1-7.
8. Tenn MW, Steacy LM, Ng CC, Ellis AK. Onset of action for loratadine tablets for the symptomatic control of seasonal allergic rhinitis in adults challenged with ragweed pollen in the Environmental Exposure Unit: a post hoc analysis of total symptom score. Allergy, Asthma & Clinical Immunology. 2018 Jan 16;14(1):5.
9. Yonekura S, Okamoto Y, Sakurai D, Iinuma T, Sakurai T, Yoneda R, Kurita J, Hanazawa T, Kawasaki Y. Efficacy of desloratadine and levocetirizine in patients with cedar pollen-induced allergic rhinitis: a randomized, double-blind study. International Archives of Allergy and Immunology. 2019 Oct 16;180(4):274-83.
10. Yonekura S, Okamoto Y, Sakurai D, Iinuma T, Sakurai T, Yoneda R, Kurita J, Hanazawa T, Kawasaki Y. Efficacy of desloratadine and levocetirizine in patients with cedar pollen-induced allergic rhinitis: a randomized, double-blind study. International Archives of Allergy and Immunology. 2019 Oct 16;180(4):274-83.
11. Ellis AK, Zhu Y, Steacy LM, Walker T, Day JH. A four-way, double-blind, randomized, placebo controlled study to determine the efficacy and speed of azelastine nasal spray, versus loratadine, and cetirizine in adult subjects with allergen-induced seasonal allergic rhinitis. Allergy, Asthma & Clinical Immunology. 2013 May 1;9(1):16.
12. Bachert C. A review of the efficacy of desloratadine, fexofenadine, and levocetirizine in the treatment of nasal congestion in patients with allergic rhinitis. Clinical therapeutics. 2009 May 1;31(5):921-44.
13. Çobanoğlu B, Toskala E, Ural A, Cingi C. Role of leukotriene antagonists and antihistamines in the treatment of allergic rhinitis. Current allergy and asthma reports. 2013 Apr;13(2):203-8.
14. Corsico AG, Leonardi S, Licari A, Marseglia G, Miraglia del Giudice M, Peroni DG, Salpietro C, Ciprandi G. Focus on the cetirizine use in clinical practice: a reappraisal 30 years later. Multidisciplinary respiratory medicine. 2019 Dec 6;14(1):40.
15. Başak PY, Vural H, Kazanoglu OO, Erturan I, Buyukbayram HI. Effects of loratadine and cetirizine on serum levels of neuropeptides in patients with chronic urticaria. International Journal of Dermatology. 2014 Dec;53(12):1526-30.
16. Greiner AN, Hellings PW, Rotiroti G, Scadding GK. Allergic rhinitis. The Lancet. 2011 Dec 17;378(9809):2112-22.

This article may be cited as: Bugti M.M., Rehman A.U., Abro A.H., Khan M.A.U., Murtaza S.G., Saleem F., Comparative Efficacy of Antiallergics and Quality of Life in Patients with Allergic Rhinitis. Pak J Med Health Sci, 2023; 17(9): 324-326.