Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/5wr97w64

COMPARATIVE EFFECTIVENESS OF ANTIHISTAMINE NASAL SPRAY VERSUS ORAL ANTIHISTAMINE ALLERGIC RHINITIS TREATMENT

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ABSTRACT

Background: Allergic rhinitis (AR) is a common condition characterized by symptoms such as sneezing, nasal congestion, and itchy eyes, significantly affecting quality of life. Antihistamines, both oral and nasal, are commonly used to manage AR symptoms, but their comparative effectiveness remains underexplored.

Objectives: To compare effectiveness of antihistamine nasal spray versus oral antihistamine allergic rhinitis treatment.

Study Setting & Design: This comparative cross-sectional study was conducted at ENT Department, Shahida Islam Hospital, Lodhran from 6th October 2020 to 5th April 2021.

Methodology: Total of 140 participants aged 18 to 65, diagnosed with moderate to severe allergic rhinitis, were recruited. Group A received 10 mg of oral ebastine once daily, while Group B received olopatadine 0.6% nasal spray twice daily. Symptom severity was assessed using a validated questionnaire at baseline, two weeks, and four weeks. Data were analyzed using SPSS version 25, with statistical significance set at $p < 0.05$.

Results: The Both treatment groups showed significant improvement in symptoms. In Group A, symptom relief was 72.85% after 7 days and 78.57% after 14 days. In Group B, symptom relief was 67.14% after 7 days and 71.42% after 14 days. Adverse events were slightly higher in Group B, with dry mouth and drowsiness being the most common.

Conclusion: The Both Ebastine and Olopatadine effectively reduced allergic rhinitis symptoms, with Ebastine showing slightly higher effectiveness. The incidence of adverse events was comparable between the two groups.

Keywords: Adverse Events, Allergic Rhinitis, Antihistamines, Ebastine, Effectiveness, Olopatadine, Symptom Relief

INTRODUCTION

Allergic rhinitis, commonly known as hay fever, is a prevalent condition affecting millions of individuals worldwide. Characterized by symptoms such as sneezing, nasal congestion, runny nose, and itchy eyes, allergic rhinitis can significantly impact quality of life, productivity, and overall well-being.[1,2] The condition is primarily triggered by allergens, including pollen, dust mites, pet dander, and mold, leading to an inflammatory response in the nasal mucosa. While various treatment options are available to alleviate symptoms, antihistamines remain a cornerstone of allergic rhinitis management. Among these, antihistamines can be administered through different routes, primarily as oral medications or nasal sprays.[3,4] Oral antihistamines have long been a standard treatment for allergic rhinitis, providing systemic relief from symptoms by blocking the action of histamine, a key mediator in allergic responses. Commonly prescribed oral antihistamines, such as cetirizine, loratadine, and fexofenadine, are generally well-tolerated and have a favorable safety profile.[5] However, they may have limitations in their onset of action, taking several hours to reach peak effectiveness, which can be a drawback for individuals experiencing acute symptoms. Furthermore, oral antihistamines can cause sedation in some patients, particularly the first-generation agents, leading to concerns about their impact on daily activities.[6]

In contrast, antihistamine nasal sprays have emerged as a viable alternative for the management of allergic rhinitis. These formulations deliver medication directly to the nasal mucosa, allowing for more rapid symptom relief.[7] By targeting the site of action, nasal sprays can provide localized treatment, potentially reducing the systemic side effects associated with oral antihistamines. Current antihistamine nasal sprays, such as azelastine and olopatadine, have been shown to be effective in controlling nasal symptoms, offering a rapid onset of action, often within minutes. This makes them particularly appealing for individuals seeking immediate relief from acute allergic reactions.[8]

The comparative effectiveness of antihistamine nasal sprays and oral antihistamines has become a topic of interest among healthcare professionals and researchers alike. While both treatment modalities aim to mitigate the symptoms of allergic rhinitis, their mechanisms of action, onset of relief, and side effect profiles may differ significantly.[9] Understanding these differences is crucial for guiding treatment decisions and optimizing patient outcomes. Furthermore, the choice between these treatment options may also be influenced by factors such as patient preference, severity of symptoms, and the presence of comorbidities.[11]

The rationale for comparing the effectiveness of antihistamine nasal sprays and oral antihistamines in treating allergic rhinitis stems from the need to optimize patient care. Understanding the differences in onset of action, symptom relief, and side effect profiles can guide clinicians in selecting the most appropriate treatment based on individual patient needs. This comparative analysis aims to provide evidence-based insights that enhance the management of allergic rhinitis and improve patients' quality of life.

MATERIALS AND METHODS

The study was approved by the (Institutional Review Board), and informed consent was obtained from all participants prior to enrollment. Study design was comparative cross-sectional. A total of 140 participants aged between 18 and 65 years who were diagnosed with moderate to severe allergic rhinitis were recruited from the outpatient of ENT Department, Shahida Islam Hospital, Lodhran from 6th October 2020 to 5th April 2021. Group A received oral antihistamine ebastine 10 mg once daily (OD), whereas Group B received the nasal antihistamine spray olopatadine 0.6% (600 mcg/100 microliters). Prior to enrollment, all participants underwent a thorough screening process that included a medical history review, physical examination, and allergy testing to confirm the diagnosis of allergic rhinitis. Participants were excluded if they had a history of significant comorbidities, were currently using other antihistamines or corticosteroids, or were pregnant or breastfeeding.

The treatment duration was set for four weeks, during which participants were instructed to use the nasal spray twice daily or take the oral antihistamine once daily as per the prescribing information. Symptom severity was assessed using a validated questionnaire that measured key symptoms of

allergic rhinitis, including sneezing, nasal congestion, runny nose, and itchy eyes. This questionnaire was administered at baseline, two weeks, and at the end of the four-week treatment period. Adverse events and any side effects were monitored throughout the study period, with participants encouraged to report any unexpected reactions. The effectiveness of each treatment was compared by evaluating changes in total symptom scores from baseline to the end of the treatment period.
Data was entered and analyzed using SPSS version 25. Numerical variables were presented as mean and standard deviation (SD), while categorical variables were presented as frequency and percentage. A Chi-square test was applied to compare the effectiveness of the medications between the two groups. A p-value of <0.05 was considered statistically significant.

STUDY RESULTS

In Table 1, the mean age of the participants was 32.5 ± 8.1 years. The duration of allergic rhinitis was 5.3 ± 3.1 years. Regarding allergens, pollen was the most common, affecting 57% of participants, while 30% were allergic to dust, and 12.1% were allergic to pets.

Table 1: Overall Demographics of Participants

Characteristic	**Mean±SD**	**Frequency (%)**
Age	Mean ± SD	32.5 ± 8.1
Gender	Male	
	Female	
Allergic Rhinitis (years)	Mean ± SD	5.3 ± 3.1
Allergens	Pollen	81(57%)
	Dust	42(30%)
	Pet	17(12.1%)

In Table 2, the most common symptom was sneezing, reported by 30% of patients, followed by nasal congestion at 25%, runny nose at 20%, itchy eyes at 15%, and postnasal drip at 10%. The total number of symptoms was 140.

Table 2: Signs & Symptoms of Disease Overall Frequency (%)

Symptom	**Count (n)**	**Percentage (%)**
Sneezing	42	30%
Nasal Congestion	35	25%
Runny Nose	28	20%
Itchy Eyes	21	15%
Postnasal Drip	14	10%
Total	**140**	**100%**

In Table 3, the baseline symptom score in Group A (Ebastine) was 16.2 ± 3.5, which improved to 8.4 ± 2.1 after treatment ($p < 0.001$). In Group B (Olopatadine), the baseline score was 15.9 ± 3.2, and it improved to 5.6 ± 1.8 ($p < 0.001$).

Table 3: Total Symptom Scores Before and After Treatment

Group	**Baseline Score**	**Final Score**	**p-value**
Group A (Ebastine)	16.2 ± 3.5	8.4 ± 2.1	<0.001
Group B (Olopatadine)	15.9 ± 3.2	5.6 ± 1.8	<0.001

In Table 4, after 7 days, the effectiveness of treatment was 72.85% in Group A (Ebastine) and 67.14% in Group B (Olopatadine). After 14 days, the effectiveness increased to 78.57% in Group A and 71.42% in Group B.

Table 4: Effectiveness of Each Treatment After 7 & 14 Days

Treatment Group	Effectiveness After 7 Days	Effectiveness After 14 Days
Group A (Ebastine)	51 (72.85%)	55 (78.57%)
Group B (Olopatadine)	47 (67.14%)	50 (71.42%)

In Table 5, the most common adverse event in Group A (Ebastine) was drowsiness (21%), while in Group B (Olopatadine), it was also drowsiness (20%). Dry mouth, headache, nausea, and fatigue were reported at varying frequencies in both groups, while 30% of patients in Group A and 36% in Group B reported no adverse events.

Table 5: Adverse Events Reported

Adverse Event	Group A (Ebastine)	Group B (Olopatadine)
Dry Mouth	10 (14%)	12 (17%)
Drowsiness	15 (21%)	14 (20%)
Headache	8 (11%)	6 (9%)
Nausea	9 (13%)	8 (11%)
Fatigue	7 (10%)	5 (7%)
No Adverse Events	21 (30%)	25 (36%)
Total Patients (n)	**70**	**70**

DISCUSSION

Allergic rhinitis (AR) is a common inflammatory condition of the nasal passages caused by allergens, affecting millions of individuals worldwide. Antihistamines are a primary treatment option for managing AR symptoms, with both oral and nasal spray formulations available.[11,12] This study compares the effectiveness of an oral antihistamine (Ebastine) and an antihistamine nasal spray (Olopatadine) in relieving AR symptoms. Previous studies have highlighted varying efficacy and side effect profiles between different antihistamine treatments. Understanding the comparative effectiveness of these treatments can guide more targeted and effective management of AR.

In our study, the mean age of participants was 32.5 ± 8.1 years, which aligns with Ahmad et al. (2023), where the mean age was slightly younger at 24.5 ± 3.0 years. Gender distribution was not explicitly discussed in our study, whereas Ahmad et al. reported a 60% male predominance. Our study found that sneezing (30%) and nasal congestion (25%) were the most common symptoms, which differs from Ahmad et al., where sneezing and rhinorrhea were the most frequently reported symptoms in 98% and 94.8% of patients, respectively. Despite these differences, both studies underscore the high prevalence of allergic rhinitis symptoms.[13]

In terms of treatment effectiveness, our study demonstrated that Ebastine (Group A) was more effective after 14 days compared to Olopatadine (Group B), with 78.57% of patients in Group A experiencing symptom relief versus 71.42% in Group B. This is consistent with the findings of Shahzad et al. (2018), who also compared the effectiveness of different treatment regimens, showing significant symptom improvement in both treatment groups. However, Shahzad et al. studied intranasal corticosteroids and oral antihistamines in combination, rather than comparing two different oral antihistamines as in our study.[14] Du et al. (2020) reported that combination therapy with oral antihistamines and intranasal corticosteroids was more effective than monotherapy, which was not directly comparable to our study's focus on oral antihistamines alone.[15] Nevertheless, the overall trend in our results, where both treatments were effective in reducing allergic rhinitis symptoms, aligns with the concept that antihistamines are a cornerstone of treatment.

Several studies have explored the effectiveness of different treatments for allergic rhinitis. Abdullah et al. (2022) emphasized that most allergic rhinitis (AR) patients can be effectively managed with pharmacological interventions at primary care levels, ensuring better symptom control and patient satisfaction.[16] They highlighted the importance of adherence to treatment to achieve optimal outcomes. Srinivas et al. (2019) compared a lipid-based ointment combined with Rupatidine to

Rupatidine alone and found that the combination therapy was superior in relieving moderate AR symptoms, underscoring the potential benefit of combination treatments.[17] Similarly, Singh et al. (2018) investigated symptom relief using different treatment groups but did not find statistically significant differences between groups at the first and fourth weeks of follow-up, suggesting that both treatments were similarly effective.[18] These studies collectively highlight the varying efficacy of AR treatments and the potential for combination therapies to offer superior results in certain cases.

Adverse events in our study were mild and included drowsiness, dry mouth, and headache, with no serious adverse events reported. This is similar to findings by Samantaray et al. (2023), who noted that adverse events were generally mild and not severe enough to cause treatment discontinuation.[19] Our findings also relate to Yaseen et al. (2020), where combination therapy showed more efficacy, suggesting that future studies could explore whether adding intranasal corticosteroids to oral antihistamines would further enhance treatment outcomes.[20] our study supports the effectiveness of Ebastine and Olopatadine in treating allergic rhinitis, with slightly better outcomes for Ebastine after 14 days. The reported adverse events were consistent with those observed in previous studies, indicating both treatments are well-tolerated. Further studies comparing these antihistamines in combination with other therapies could provide more insights into optimizing treatment for allergic rhinitis. The study was limited by a relatively small sample size, which may affect the generalizability of the results. Additionally, the short follow-up period may not fully capture long-term treatment efficacy and adverse events.

CONCLUSION

In conclusion, both Ebastine and Olopatadine were effective in reducing allergic rhinitis symptoms, with Ebastine showing slightly higher effectiveness after 14 days. Adverse events were mild and comparable between the two treatments, with drowsiness being the most commonly reported side effect.

REFERENCES

1. Bernstein JA, Bernstein JS, Makol R, Ward S. Allergic rhinitis: a review. JAMA. 2022 Mar 12;331(10):866-77.
2. Naclerio R, Ansotegui IJ, Bousquet J, Canonica GW, d'Amato G, Rosario N, Pawankar R, Peden D, Bergmann KC, Bielory L, Caraballo L. International expert consensus on the management of allergic rhinitis (AR) aggravated by air pollutants: impact of air pollution on patients with AR: current knowledge and future strategies. World Allergy Organization Journal. 2020 Mar 1;13(3):100106.
3. Inomata T, Nakamura M, Iwagami M, Sung J, Ebihara N, Fujisawa K, Muto K, Nojiri S, Ide T, Okano M, Okumura Y. Individual characteristics and associated factors of hay fever: A large-scale mHealth study using AllerSearch. Allergology International. 2022;71(3):325-34.
4. Siddiqui ZA, Walker A, Pirwani MM, Tahiri M, Syed I. Allergic rhinitis: diagnosis and management. British journal of hospital medicine. 2022 Feb 2;83(2):1-9.
5. García-Marcos L, Asher MI, Pearce N, Ellwood E, Bissell K, Chiang CY, El Sony A, Ellwood P, Marks GB, Mortimer K, Martínez-Torres AE. The burden of asthma, hay fever and eczema in children in 25 countries: GAN Phase I study. European Respiratory Journal. 2022 Sep 1;60(3).
6. Rong CW, Salleh H, Nishio H, Lee M. The impact of increasing ambient temperature on allergic rhinitis: A systematic review and meta-analysis of observational studies. Science of The Total Environment. 2024 Oct 15;947:174348.
7. Sharma K, Akre S, Chakole S, Wanjari MB. Allergic rhinitis and treatment modalities: a review of literature. Cureus. 2022 Aug;14(8):e8679.
8. Almatroudi A, Mousa AM, Vinnakota D, Abalkhail A, Alwashmi AS, Almatroodi SA, Alhumaydhi FA, Kabir R, Mahmud I. Prevalence and associated factors of respiratory allergies

in the Kingdom of Saudi Arabia: A cross-sectional investigation, September–December 2020. PLoS One. 2021 Jun 23;16(6):e0253558.
9. Dierick BJ, van der Molen T, Flokstra-de Blok BM, Muraro A, Postma MJ, Kocks JW, van Boven JF. Burden and socioeconomics of asthma, allergic rhinitis, atopic dermatitis and food allergy. Expert review of pharmacoeconomics & outcomes research. 2020 Sep 2;20(5):437-53.
10. Oliveira TB, Persigo AL, Ferrazza CC, Ferreira EN, Veiga AB. Prevalence of asthma, allergic rhinitis and pollinosis in a city of Brazil: a monitoring study. Allergologia et Immunopathologia. 2020 Nov 1;48(6):537-44.
11. Gao H, Niu Y, Wang Q, Shan G, Ma C, Wang H, Hu Y, Guan K, Gu J, Wang J, Wang T. Analysis of prevalence and risk factors of adult self-reported allergic rhinitis and asthma in plain lands and hilly areas of Shenmu city, China. Frontiers in Public Health. 2022 Jan 4;9:749388.
12. Tenero L, Vaia R, Ferrante G, Maule M, Venditto L, Piacentini G, Senna G, Caminati M. Diagnosis and management of allergic rhinitis in asthmatic children. Journal of asthma and allergy. 2023 Dec 31:45-57.
13. Ahmad J, Abbas N, Iftikhar M, Mujtabaghauri S, Nasir MQ. Efficacy of Antihistamine Nasal Spray Compared with Oral Antihistamine in Treatment of Allergic Rhinitis. Pakistan Journal of Medical & Health Sciences. 2023 Jun 9;17(04):539-45.
14. Shahzad J, Chaudhry S, Aslam MM, Akbar A, Shahzad MH, Chaudhry S, Aslam MM, Akbar A, Hanif M. Comparison of Fluticasone Furoate Nasal Spray Versus Combined Oral Anti-Histamine and Anti-Leukotriene Therapy in Allergic Rhinitis. Journal of Rawalpindi Medical College. 2018 Jun 30;22(2):533-39.
15. Du K, Qing H, Zheng M, Wang X, Zhang L. Intranasal antihistamine is superior to oral H1 antihistamine as an add-on therapy to intranasal corticosteroid for treating allergic rhinitis. Annals of Allergy, Asthma & Immunology. 2020 Nov 1;125(5):589-96.
16. Abdullah B, Abdul Latiff AH, Manuel AM, Mohamed Jamli F, Dalip Singh HS, Ismail IH, Jahendran J, Saniasiaya J, Keen Woo KC, Khoo PC, Singh K. Pharmacological management of allergic rhinitis: a consensus statement from the Malaysian Society of Allergy and Immunology. Journal of Asthma and Allergy. 2022 Dec 31:983-1003.
17. Srinivas CV, Subbaiah S, Chandregowda BV. Treatment of Allergic Rhinitis: A Comparative Study of Traditional Antihistamine oral Rupatidine Versus Oral Rupatidine with a Lipid Based Nasal Ointment. Indian Journal of Otolaryngology and Head & Neck Surgery. 2019 Nov;71:1699-704.
18. Singh NK, Nagpure PS, Yadav MK, Chavan S, Manpe S, Ganeshkar R. Effectiveness of Oral Antihistamines and Intranasal Steroid Spray in relieving Ocular Symptoms in Allergic Rhinitis using Total Ocular Symptom Score. An International Journal of Otorhinolaryngology Clinics. 2016 Dec 1;8(2):45-50.
19. SamantarayK, DhirR, DeshmukhS, SrivastavaP,BhagatSB, PatilS, et al. Comparative clinical assessment of mometasone furoate-azelastine hydrochloride intranasal spray (Ryaltris AZ®) with fluticasone furoate-azelastine hydrochloride intranasal spray in patients with allergic rhinitis in India. Int J Otorhinolaryngol Head Neck Surg 2023;9:637-41.
20. Yaseen MA, Piro SM. The effect of intranasal steroid in the treatment of allergic rhinitis with and without oral antihistamine (comparative study). AMJ (Advanced Medical Journal). 2022 Jun 10;6(2):183-95.