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# Using Intranasal Corticosteroids and Oral Antihistamines to Treat Allergic Rhinitis: A Comparison of The Mean Total Nasal Symptom Score

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## ABSTRACT

**Background:** Allergic rhinitis (AR) is a global public health issue. The disease is a leading cause of death and disabilities globally. **Objective:** To compare the mean total nasal symptom score using intranasal corticosteroids with oral anti-histamine in management of allergic rhinitis. **Study Design:** Randomized controlled trial. **Settings:** Department of ENT, Shalamar Medical and Dental College/ Shalamar Hospital, Lahore Pakistan. **Duration:** 1st January 2023 to 30 June 2023. **Methods:** 100 cases equally divided in two groups A&B, Intranasal corticosteroids were administered in Group A and oral anti-histamine in Group B cases, The final evaluation was done after 4 weeks of treatment. **Results:** Comparison of mean total nasal symptom score using intranasal corticosteroids with oral anti-histamine in management of allergic rhinitis shows that 1.51 ± 0.37 score in Group-A and 1.27 ± 0.11 score in Group-B, (p-value < 0.05). **Conclusion:** We found that the use of intranasal corticosteroids resulted in a substantially reduced mean total nasal symptom score compared to the use of oral anti-histamine in the treatment of allergic rhinitis.

*Keywords: Allergic rhinitis, Management, Intranasal corticosteroids, Oral anti-histamine, Total nasal symptom score.*

## INTRODUCTION

It's important to recognize that allergic rhinitis (AR) is a global public health problem. The disease is a leading cause of death and disabilities globally.[1] AR is one of the most prevalent atopic illnesses in Western Europe, with a frequency of 20-30%.[2] Nasal stuffiness, rhinorrhea, itching, sneezing, and non-nasal symptoms including burning, itchy, watery eyes, or itchy ears and tongue are typical with AR. Patients' quality of life may suffer as a result of these symptoms.[3]

Inflammation of the nasal and ocular mucous membranes is the hallmark of allergic rhinitis (AR), which is brought on by an immunological response to an external allergen that is mediated by immunoglobulin-E (IgE). Numerous inflammatory mediators interact intricately in this disease. When it comes to treating moderate-to- severe cases of allergic rhinitis, intranasal steroid medicines (INS) are frequently suggested as the first line of treatment. This is because they work well to reduce nose symptoms and enhance patients' quality of life in general. When compared to antihistamines taken orally or intranasally and antileukotrienes, INSs are more effective; yet, they are on par with or comparable to the use of both drugs individually.[4]

Oral antihistamines (OA) have always played an important role in the pharmaceutical treatment of allergic rhinitis (AR). Histamine, produced from L-histidine by the enzyme histidine decarboxylase and held by basophils and mast cells in the nasal mucosa, is an essential regulator of the immunological response during allergic inflammation. Vascular smooth muscle cells and endothelial cells are the major sites of histamine receptors responsible for histamine-induced increase in vascular permeability and vasodilatation. These effects are particularly important in determining how the symptoms of allergic rhinitis develop, such as nasal discharge or congestion.[5]

After four weeks of intranasal steroid therapy (INS), the mean total nasal symptom score was 1.9 ± 1.726, whereas the mean total nasal symptom score after four weeks of oral anti-histamine treatment was 1.21 ± 0.65.6 In another study, the improvement in total nasal symptom score (p value <lock>><</lock> 0.05, SMD -0.70 [95% CI, -0.93 to -0.47]) showed that INS were superior to OAs.[7]

One of the most common problems encountered in tertiary care hospitals is allergic rhinitis. The results of my study will be helpful in selecting the most effective treatment method for allergic rhinitis, as there is controversy in the literature regarding the use of oral antihistamines and intranasal corticosteroids for this condition.

## METHODS

A randomized controlled trial was conducted in the Ear, Nose, and Throat Department of Shalamar Medical and Dental College and Shalamar Hospital in Lahore, Pakistan. The duration of study was January 1, 2023 and June 30, 2023. One hundred male and female participants with the history of allergic rhinitis, aged twenty to sixty years, were included and individuals with a diagnosis of asthma, pregnant women who had a recent history of a of using the study medications within the past four weeks, a diagnosis of asthma, and pregnant females were excluded. These cases were equally divided in two groups A&B, Intranasal corticosteroids were administered in Group A and oral anti-histamine in Group B cases. Intranasal corticosteroids (fluticasone furoate nasal spray administered at 110µg daily) was received in Group A and Group B case received oral anti-histamine (fexofenadine 120 mg once a day).

After 4 weeks of therapy, the TNSS (which measures the severity of nasal symptoms such rhinorrhea, itchy noses, stuffy noses, and sneezing was calculated. The TNSS was calculated by adding up the scores for the four symptoms, with a potential range of 0 (no symptoms) to 12 (very severe symptoms) (maximum symptom intensity).

Following four weeks of treatment, the study results were subject to analysis. Demographic variables, including age, duration of illness, and the total nasal symptom score, were assessed using descriptive statistics such as mean and standard deviation, both before and after the 4-week therapy period. Gender, as a quantitative variable, was characterized by determining its frequencies and percentages. To compare the total nasal symptom score after the 4-week therapy between the two groups, an independent sample t-test was applied. Furthermore, a paired sample t-test was used to assess any differences in the overall nasal symptom score before and after the therapy.

## RESULTS

It was recorded 30(60%) in Group-A and 27(54%) in Group-B were between 20-40 years, and 20(40%) in Group A and 23(46%) in Group B were between 41-60 years, mean age was calculated as 37.11 ± 8.23 and 36.14 ± 10.47 in Group-B and B respectively. Gender distribution shows that 32(n=64) in Group-A and 34(68%) in Group-B were male and 36(18%) in Group-A and 16(32%) in Group-B were females. Comparison of mean total nasal symptom score using intranasal corticosteroids with oral anti-histamine in management of allergic rhinitis shows that 1.51 ± 0.37 score in Group-A and 1.27 ± 0.11 score in Group-B (P-value <0.05).

**Table 1: Comparison of intranasal corticosteroids with oral anti-histamine in management of allergic rhinitis**

| TNSS | Group-A | | Group-B | | P-value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| | 1.51 | 0.37 | 1.27 | 0.11 | <0.05 |

## DISCUSSION

Snoring, watery, mucus rhinorrhea, nasal congestion, and nasal itching are all common signs of allergic rhinitis. Allergic conjunctivitis is a common symptom of the illness. The incidence of allergic rhinitis has increased dramatically over the last 30 years, with studies indicating a doubling in that period. Avoidance of allergens (where feasible), intranasal corticosteroids, short-term decongestants, intranasal cromoglycate, oral anti-histamines, and allergen immunotherapy are all effective treatments for allergic rhinitis.

As, there is a controversy in literature regarding the use of intranasal corticosteroids and oral anti-histamine for allergic rhinitis, so this study was planned and the results of may be helpful in adopting the better treatment modality for allergic rhinitis. Between 30 and 60 million Americans suffer from allergic rhinitis each year, with a frequency of 3-19%. Eighty percent of those who acquire allergic rhinitis do so before the age of twenty.[7] Seven percent of adults and nine percent of children under 18 years old in 2012 reported having allergic rhinitis in the previous year.[8]

It has been shown in Scandinavian research that the overall prevalence rate is 15% in males and 14% in women.[9] Allergies to the nose and sinuses may be more or less common in different regions. Children in Africa and Latin America have the highest rates of severe allergic rhinitis symptoms.[10] This may be because to variations in the prevalence and severity of allergies across various regions.

Another research found that after 4 weeks of INS, patients had a mean total NS score of 1.91.726, whereas those

taking an oral anti-histamine had a score of 1.210.65.1, which is quite close to the results of our own study. Whereas, another research found that INS were better than OAs in reducing the overall nasal symptoms score (p-value > 0.05, SMD -0.70 [95% CI, -0.93 to -0.47]).[11]

A previous study that compared the effectiveness of intranasal corticosteroids and H(1) receptor antagonists used on an as-needed basis for the treatment of seasonal allergic rhinitis found that intranasal corticosteroids demonstrated greater efficacy in reducing allergic inflammation.[12] Additionally, a study conducted in Spain came to the conclusion that intranasal corticosteroids were more effective than oral antihistamines in enhancing nasal symptom relief and improving the overall QOL in individuals with AR.[13]

Furthermore, a separate study examined the safety and efficacy of a daily dose of 200 micrograms of intranasal corticosteroids for the management of perennial allergic rhinitis (PAR). The study enrolled participants with a history of rhinitis lasting at least 2 years and randomly assigned them to receive either intranasal corticosteroids (238 participants) or a placebo (233 participants) once daily for a duration of 6 weeks.[14]

The results of this trial indicated that intranasal corticosteroids were more effective than the placebo in alleviating nasal symptoms associated with PAR. This research provides additional support for the adoption of a once-daily dosing regimen of intranasal corticosteroids in the treatment of PAR, as both the morning and evening TNSS exhibited similar improvements.

After beginning treatment with 200g of intranasal corticosteroids once day, patients with PAR of all ages reported a considerable improvement in their quality of life. Furthermore, participants in the Intranasal Corticosteroids group had adverse events at a rate comparable to the placebo group.

## CONCLUSION

We found that the use of intranasal corticosteroids resulted in a substantially reduced mean total nasal symptom score compared to the use of oral anti-histamine in the treatment of allergic rhinitis.

## LIMITATIONS

Study findings are based on single center which needs to be verified through some other multicenter studies.

## SUGGESTIONS / RECOMMENDATIONS

It is recommended that the treatment of allergic rhinitis, especially when symptoms are moderate to severe, intranasal corticosteroids are the first-line agent. It is important to educate patients about side effects, treatment adherence, and the differences between oral antihistamines and intranasal corticosteroids.

## CONFLICT OF INTEREST / DISCLOSURE

The authors declares no conflict of interest.

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None.

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