

Research Article**Intra Nasal Corticosteroids Versus Combined Corticosteroids and Antihistamines in Management of Allergic Rhinitis**

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Abstract: Background: Allergic rhinitis (AR) is a heterogeneous disorder that despite its high prevalence is often undiagnosed. It is characterized by one or more symptoms including sneezing, itching, nasal congestion, and rhinorrhea. Many causative agents have been linked to AR including pollens, molds, dust mites, and animal dander. The objective of this research was to evaluate the efficacy of intranasal corticosteroids (INCS) with antihistamines in treating AR, with a focus on symptoms including itching, sneezing, runny nose, and nasal congestion, as compared to INCS alone. **Methods:** This research was conducted on a sample of 60 patients, aged between 18 and 50 years old, who had a history of AR and were clinically diagnosed based on AR criteria. Study conducted at Department of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from January to June 2013. It was ensured that these patients had not used nasal steroids in the month before to the commencement of baseline measurements. The study design was randomized and prospective, using a controlled approach. The patients were randomly divided into 2 equal groups: Group 1: treated with local corticosteroids alone (Fluticasone). Group 2: treated with local corticosteroids and antihistaminic spray (Fluticasone + Azelastine). **Results:** Total 60 patients included in both Groups. Nasal symptoms were insignificantly different between both groups before treatment. Two nasal symptoms were insignificantly different between the two groups while rhinorrhoea and sneezing were significantly improved in Group 2 than Group 1 after 1 and 2 months (p-value<0.05). Nose symptoms were insignificantly different between both groups before treatment. Nasal congestion or stuffiness, nasal blockage or obstruction and trouble sleeping were insignificantly different between both groups while trouble breathing through the nose and unable to get enough through my nose during exercise or exertion were significantly improved in Group 2 than Group 1 after 1 and 2 months (p-value<0.05). **Conclusions:** Patients treated with Fluticasone nasal spray alone or in combination with Azelastine nasal spray experience significant improvement in various complaints as evidenced by improved VAS scale regarding (rhinorrhoea and sneezing) and A-NOSE score regarding (both trouble breathing through the nose and the inability to get enough breath during exercise).

Keywords: Subaxial cervical spine, SLIC score, ASIA grade.

INTRODUCTION

Allergic rhinitis (AR) is a heterogeneous disorder that despite its high prevalence is often undiagnosed. Allergic rhinitis (AR) is the predominant form of chronic rhinitis, with a prevalence of 10- 20% among the population [1]. The condition may manifest as either seasonal, occurring during certain periods like

the pollen season, or perennial, persisting throughout the whole year [2]. It is characterized by one or more symptoms including sneezing, itching, nasal congestion, and rhinorrhea. Many causative agents have been linked to AR including pollens, molds, dust mites, and animal dander. The symptoms of AR, including rhinorrhoea, nasal blockage, itching, sneezing, watery eyes, and

sometimes cough, are induced spontaneously with exposure to allergens and triggering factors, and may potentially be reversed [3]. Severe AR has been linked to substantial detriments in quality of life, sleep, and job productivity [1]. Co-occurrence of many illnesses in a patient, known as associated disease, is very prevalent in allergic disorders. Specifically, more than 85% of individuals with asthma also have AR. Conversely, the coexistence of asthma and AR is seen in only 20 - 30% of individuals. The key supplementary tests for diagnosing AR, with high specificity and sensitivity, are the acute hypersensitivity skin prick test (SPT) utilizing the puncture method and assessment of allergen-specific IgE levels in the blood [4, 5]. Avoiding allergens, allergen immunotherapy, and pharmacological intervention are relevant treatment efforts in AR. INCS have been recognized as a safe and efficient first therapy for AR. The presence of many chronic conditions in a patient amplifies the intensity of asthma [6]. The diagnosis mostly relies on clinical evaluation, taking into account the correlation between many symptoms. Several INCS are available, such as beclomethasone dipropionate, budesonide, flunisolide, fluticasone propionate, mometasone furoate, and triamcinolone acetonide. Each of these treatments is efficacious for managing seasonal AR and may also be used as a prophylactic step for chronic AR. Generally, they relieve nasal congestion and itching, runny nose, and sneezing that occur during the first and last phases of an allergic response, with studies suggesting almost complete elimination of symptoms during the later phase [7]. Histamine is the primary pathophysiological mediator of AR, primarily acting via stimulating the H1 receptor [8]. Antihistamines used to treat AR are H1 receptor antagonists. Antihistamines may be categorized into two groups: oral and intranasal. Oral antihistamines may be categorized into two groups: older, first-generation antihistamines (such as chlorpheniramine) and newer, second-generation antihistamines (such as cetirizine). Intranasal antihistamines have a rapid onset of action, often within 15-30 minutes, surpassing the speed of oral antihistamines. Furthermore, no sedative effects have been seen with their use [9]. The objective of this research was to examine the effects of INCS and antihistamines together vs INCS alone in the treatment of AR, specifically in relation to symptoms such as itching, sneezing, rhinorrhoea, and nasal obstruction.

METHODS AND PATIENTS

This study was conducted on a sample of 100 patients, aged between 18 and 50 years old, who had a history of AR and were clinically diagnosed based on specific criteria for AR symptoms (including sneezing, runny nose, nasal congestion, itching of the eyes, nose, and palate, postnasal drip, cough, irritability, and fatigue). Study conducted at Department of Otolaryngology-Head & Neck Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh from January to June 2013. It is important to note that none of the patients had used nasal steroids in the month

prior to the start of the study.

Exclusion criteria were severe asthma, planned surgery of nasal cavity, patient with adrenal disease, patient with cataract or glaucoma, nasal fungal infection, other causes of elevated IgE level like (parasite infection, allergic bronchopulmonary aspergillosis and churg-stauss/ polyarteritis nervosa).

Randomization

Using a computer-generated software, patients were divided into two equal groups at random: Group 1: AR were treated with local corticosteroids alone (Fluticasone) two puffs in each nostril once daily for two weeks then lowered to one puff in each nostril once daily based on patient improvement. Group 2: AR was treated with local corticosteroids and antihistaminic spray (Fluticasone +Azelastine) two puffs in each nostril once daily for two weeks then lowered to one puff in each nostril once daily based on patient improvement.

All patients were subjected to complete history taking, assessed before treatment and after first and second month of treatment using: visual analogue scale (VAS) [10] and questionnaire to evaluate nasal obstruction symptoms done by Arabic version of nose scale (A-NOSE) [11], general examination, otorhinolaryngological clinical examination including anterior rhinoscopy and diagnostic nasal endoscopy and serum IgE level test.

The VAS is a technique used to evaluate the subjective perception of nasal symptoms, such as sneezing, nasal congestion, nasal itching and rhinorrhoea. The scale ranges from 0, denoting the complete lack of symptoms, to 10, representing the existence of intense symptoms. Patients were directed to mark a cross on a line that symbolizes their unique experiences with nasal symptoms.

Statistical analysis

Statisticians at IBM Inc. in Armonk, NY, USA, used SPSS v21 to compile and analyse the data. The range, standard deviation (SD), and mean were the quantitative variables. To compare the two groups, an unpaired Student's t-test was used. The Chi-square test was used to evaluate the qualitative variables, which were presented as percentages and frequencies. Statistical significance was determined by a two-tailed p value that was less than 0.05.

RESULTS

A total of 100 patients were evaluated for their eligibility in this research. Out of these, 15 patients did not match the required requirements, while 5 patients declined to participate. Additionally, there were missing data from 20 patients, with 8 patients from Group 1 and 12 patients from Group 2 failing to complete the follow-up. The remaining 60 patients were randomly assigned to two groups, with 30 patients in each group. The patients who were assigned to

certain groups were monitored and subjected to statistical analysis.

Table 1: Demographic data, bronchial asthma, skin allergy, allergic conjunctivitis type of AR and total serum IgE

		Group 1 (n=30)	Group 2 (n=30)	P value
Age (years)		34.5 ± 10.22	32.8 ± 9.16	0.378
Sex	Male	11 (36.6%)	13 (43.3%)	0.542
	Female	19 (63.3%)	17 (56.6%)	
Bronchial asthma		9 (30%)	11 (36.6%)	0.523
Skin Allergy		5 (16.6%)	7 (23.3%)	0.461
Allergic conjunctivitis		8 (26.6%)	7 (23.3%)	0.817
Type of AR	Seasonal	14 (46.6%)	12 (40%)	0.545
	Perennial	16 (53.3%)	18 (60%)	
Total serum IgE (IU/ml)		220.9 ± 170.7	167.2 ± 128.32	0.079

The two groups did not vary significantly in terms of nasal symptoms prior to therapy, which include irritation, itching, rhinorrhea, and sneezing. Concerning stuffiness and itching in the nose, neither group

differed significantly from the other. Compared to Group 1, Group 2 showed a significant improvement in rhinorrhea and sneezing at the 1- and 2- month marks.

Table 2: Comparison between both groups according to VAS of different complaints before and after treatment

	Nasal congestion	Nasal itching	Rhinorrhoea	Sneezing
Before treatment				
Group 1	6.6 ± 2.15	6.22 ± 2.23	5.9 ± 2.02	5.9 ± 2.02
Group 2	5.8 ± 2.14	5.6 ± 2.86	5.7 ± 2.33	5.1 ± 2.54
P value	0.072	0.216	0.648	0.085
After 2 months				
Group 1	2.04 ± 1.74	2.08 ± 1.77	2.18 ± 1.96	2.46 ± 1.72
Group 2	1.5 ± 1.36	1.4 ± 1.53	1.1 ± 1.67	1.4 ± 2.03
P value	0.076	0.056	0.003*	0.006*

The presence of nose symptoms (such as nasal congestion, nasal blockage, difficulty breathing, difficulties sleeping, and inadequate nasal airflow during exercise or exertion) showed no significant difference between the two groups prior to therapy. The occurrence of nasal congestion or stuffiness, nasal blockage or obstruction, and difficulty sleeping did

not show significant differences between both groups. However, there was a significant improvement in the ability to breathe through the nose and the ability to get enough air through the nose during exercise or exertion in Group 2 compared to Group 1 after 1 and 2 months. (P value < 0.05).

Table 3: Comparison between both groups according to nose score of different complaints before and after treatment

	Nasal congestion or stuffiness	Nasal blockage or obstruction	Trouble breathing through the nose	Trouble sleeping	Unable to get enough through my nose during exercise or exertion	Total score
Before treatment						
Group 1	2.5 ± 0.81	2.8 ± 0.93	2.8 ± 0.79	2.5 ± 1.18	3.5 ± 0.74	14.12 ± 3.37
Group 2	2.5 ± 0.97	2.6 ± 1.15	2.5 ± 0.99	2.2 ± 1	3.2 ± 0.83	12.98 ± 3.64
P value	0.912	0.295	0.098	0.124	0.058	---
After 1 month						
Group 1	1.3 ± 0.53	1.4 ± 0.64	1.5 ± 0.65	1 ± 0.86	1.8 ± 0.62	6.98 ± 2.21
Group 2	1.2 ± 0.69	1.2 ± 0.7	1.1 ± 1.05	0.8 ± 0.84	1.4 ± 0.73	5.74 ± 3.23
P value	0.871	0.105	0.042*	0.198	0.003*	---
After 2 months						
Group 1	1.1 ± 0.51	1.2 ± 0.58	1.3 ± 0.62	1 ± 0.84	1.6 ± 0.64	6.18 ± 1.86
Group 2	1 ± 0.59	1 ± 0.71	1 ± 0.95	0.7 ± 0.8	1.2 ± 0.82	4.98 ± 2.61
P value	0.468	0.128	0.027*	0.238	0.033*	---

DISCUSSION

Nasal corticosteroids (steroids) delivered by a nasal spray are the first-line treatment for the symptoms of allergic rhinitis. These drugs have few side effects and dramatically relieve symptoms in most people.

Symptoms of seasonal allergic rhinitis can occur in spring, summer, and early fall. They are usually caused by allergic sensitivity to airborne mold spores or to pollens from trees, grass, and weeds. Perennial: People with perennial allergic rhinitis experience symptoms

year-round. The major findings in our study showed that the nasal symptoms (nasal congestion, nasal itching, rhinorrhea and sneezing) were insignificantly different between both groups before treatment. Our results were supported by study of Cockburn IM *et al.* [12] they found that the individual nasal symptoms were insignificantly different before treatment between intranasal Azelastine hydrochloride and fluticasone propionate group or Azelastine hydrochloride group. Supporting our results, Asher MI *et al.* [13] found that baseline individual nasal symptoms were insignificantly different between the groups who received 200 µg ciclesonide, 5 mg levocetirizine, or a combination of both. In the study of Braun-Fahrlander C. *et al* [14] demonstrated that the baseline individual nasal symptoms (congestion, itching, sneezing, rhinorrhea) were insignificantly different between combination therapy (with intranasal azelastine and fluticasone group) and fluticasone alone group. In the present study, nasal symptoms were significantly improved after 1month and after 2month compared to before treatment in Fluticasone group and Fluticasone + Azelastine group (P value <0.001). In agreement with our results, Charpin D. *et al.* [15] they found that INCS/INAH combination and INCS monotherapy significantly improved the total mean rhinoconjunctivitis VAS score and nasal symptoms compared to baseline. Supporting our results, Ziering RW. *et al* [16] The research showed that MP-Aze Flu was linked to enhanced VAS ratings in all areas examined, such as the intensity of AR symptoms, asthma symptoms, sleep quality, daily job or school activities, daily social activities, and daily outdoor activities. In the present study, two nasal symptoms (nasal congestion and nasal itching) were insignificantly different between the two groups. But rhinorrhea and sneezing were significantly improved in Fluticasone+Azalastine group than Fluticasone group after one and two months. Consistent with our findings, Charpin D. *et al.* [15] observed that the combination of INCS and intranasal antihistamines (INAH) led to a substantial improvement in the overall mean score of the Rhino conjunctivitis Quality of Life Questionnaire (RQLQ) compared to using INCS alone. Similarly, Du *et al.* [17] showed that the combined treatment of INAH and INCS was more effective than INCS alone in reducing symptoms such as rhinorrhea and sneezing, as measured by the VAS scale. In this study, the severity of various nasal complaints (such as nasal congestion, nasal blockage, difficulty breathing through the nose, trouble sleeping, and inability to get enough air through the nose during exercise or exertion) was found to be statistically insignificant between the two groups before the treatment. Our results were in contrary with study of Asher MI *et al.* [13] A study showed that the baseline individual nasal symptoms, as measured by the total nasal symptom score (TNSS), and the reflective total ocular symptom score (rTOSS) were comparable among the three treatment groups who were given 200 µg ciclesonide, 5 mg levocetirizine, or a combination of both. These scores represent the signs and symptoms that caused significant discomfort and

interfered with daily activities. In the present study, the nose ratings of several symptoms (nasal congestion or stuffiness, nasal blockage or obstruction, difficulties sleeping) were insignificantly different between both groups. However, the symptoms of difficulty breathing through the nose and insufficient airflow during exercise or exertion were considerably alleviated in the group receiving both local corticosteroids and antihistaminic spray, compared to the group receiving just local corticosteroids, after one and two months. Our results were in contrary with study of Pinar *et al.* [18] The investigation revealed a substantial difference between the groups for daily nasal symptoms, including nasal blockage, nasal discharge, sneezing, and itching, throughout the second week and first month evaluations ($p < 0.05$). Additionally, Charpin D *et al.* [15] The study discovered that the combination therapy of INCS and INAH was more effective than INCS alone in reducing the average morning and evening 12-hour reflective TNSS to a greater extent (mean difference -0.44, 95% confidence interval -0.61 to -0.27, $P < 0.00001$, $I^2 = 8\%$). Additionally, the combination therapy also resulted in a significant decrease in the total ocular symptom score (mean difference -0.62, 95% confidence interval -1.05 to -0.19, $P = 0.005$, $I^2 = 36\%$). According to our results, nasal congestion or stuffiness, nasal blockage or obstruction and trouble sleeping were insignificantly different between both groups. Trouble breathing through the nose and unable to get enough through my nose during exercise or exertion were significantly improved in local corticosteroids and antihistaminic spray group than local corticosteroids alone group after one month and two months (P value =0.042 and 0.003 respectively). In agreement with our results, Charpin D *et al.* [15]. The study discovered that the combined treatment of INCS and INAH was notably more effective in relieving nasal and ocular symptoms and enhancing the quality of life compared to the use of INCS alone in individuals with AR. In a similar vein, Cockburn IM. *et al.* [12] shown that patients treated with MP-Aze Flu reported considerably more substantial decreases in reflected r TNSS, reflecting total ocular symptom score (r TOSS), and reflective total of 7 symptom scores (r T7SS) compared to those treated with AZE. According to our results, Total serum IgE was insignificantly different between both groups. Similar to our results, Segundo *et al.* [19] they found that there was no significant change in IgE level between the studied groups. Our study had some limitations as it was a single center study, the study lacked comparison with controlled group and adverse effects weren't evaluated.

CONCLUSIONS

Patients treated with Fluticasone nasal spray alone or in combination with Azelastine nasal spray experience significant improvement in various complaints as evidenced by improved VAS scale regarding (rhinorrhoea and sneezing) and A-NOSE score regarding (both trouble breathing through the nose and the inability to get enough breath during exercise).

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