



INTRANASAL FLUTICASONE SPRAY VERSUS INTRANASAL FLUTICASONE SPRAY WITH ORAL LEVOCETIRIZINE IN TREATMENT OF ALLERGIC RHINITIS – A RANDOMIZED CONTROL STUDY

ENT

Dr Suni Iqbal* Post Graduate, Department of ENT *Corresponding Author

Dr Prabhu Khavasi Associate Professor, Department of ENT

Dr Niya Joseph Neelamkavi Post Graduate, Department of ENT

ABSTRACT

Background: Allergic rhinitis is an Ig E mediated inflammatory response of nasal mucosa, known to have a significant impact on quality of life. Clinical studies have found that combining an antihistamine with an intranasal corticosteroid provides few or no advantages over monotherapy with an intranasal corticosteroid. **Objective-** To compare clinically the effectiveness of intranasal fluticasone spray and intranasal fluticasone spray with oral levocetirizine in relief of symptoms in allergic rhinitis using TNSS (Total Nasal Symptom Score)- a randomized control study. **Materials and methods:** A Randomized control study with total number of 40 patients clinically diagnosed with allergic rhinitis coming to the ENT OPD, S.N.M.C, Bagalkot was done. Patients were randomized into two groups. In group A, intranasal fluticasone spray 2 puffs OD was given and combination of intranasal fluticasone spray with oral levocetirizine OD in group B for a period of 4 weeks. **Results:** Symptom improvement in nasal symptom scores in both groups were compared at 1st week, 2nd week and 4th week. Patients in intranasal fluticasone with oral levocetirizine group had better improvement compared to the intranasal fluticasone spray alone in third visit, which was statistically significant ($p=0.002$). This study concludes that, although corticosteroids are the mainstay of treatment in allergic rhinitis, but when used with oral levocetirizine has better tolerability.

KEYWORDS

Allergic rhinitis, fluticasone spray, levocetirizine, oral antihistamine

INTRODUCTION

Allergic rhinitis is characterized by inflammatory changes in nasal mucosa which is caused by exposure to inhaled allergens¹. It is estimated that disease has a prevalence of 20 % which affects ~400 million people worldwide². It is a disease which is triggered by Ig E dependent chronic inflammation of nasal mucosa in response to environmental allergens and the mediators released from immune cells of allergy including mast cells and eosinophils leading to vasodilatation, hypersecretion and inflammatory edema in nasal mucosa³. It leads to significant impairment in quality of life, mental and psychomotor performance compared to healthy people and also affects school learning performance especially in adolescents³. It is a disease affecting all the age groups especially teenage years. Patients will present with one or more symptoms of nasal obstruction, congestion, rhinorrhea, sneezing, and itching. Some patients report hyposmia, postnasal drip, and eye redness. The diagnosis is clinical; based on symptoms and clinical examination findings⁷. The nasal mucosa appears pale or bluish with watery nasal discharge. Monotherapy with either H1 antihistamines or intranasal corticosteroids (INCS) is recommended for allergic rhinitis by International guidelines⁴. Intranasal corticosteroids are effective for the treatment of all symptoms of allergic rhinitis, especially congestion and so recommended as the first line treatment for moderate to severe or persistent allergic rhinitis⁵. They act by decreasing the influx of inflammatory cells and inhibiting the release of cytokines, thereby reducing inflammation of the nasal mucosa⁶. Fluticasone propionate nasal spray has onset of action within 12 hours and peak effect occurs after several days⁷. Fluticasone propionate and mometasone furoate are the most commonly used intranasal corticosteroids in the treatment of allergic rhinitis. They can all be administered once daily using a nasal spray and at recommended dosages that exhibit no major differences in the clinical efficacy or safety profiles in the treatment⁸.

Oral antihistamines though they effectively control the nasal symptoms of sneezing, itching and rhinorrhea, but it is less effective when compared to intranasal steroids⁵. They are competitive blockers of histamine at H1 receptor and have rapid onset of action and is suitable for as needed treatment when patient is seeking immediate relief of symptoms. This study was conducted with the objective of comparing the clinical efficacy of intranasal corticosteroid - fluticasone propionate spray alone and in combination with oral antihistamine levocetirizine for symptomatic improvement in allergic rhinitis.

MATERIALS AND METHODS:

A Randomized control study was carried out in patients who came to

E.N.T OPD of S.N.M.C Bagalkot with clinical features of allergic rhinitis between November 2020 to April 2021. A total of 40 patients were included and they were randomized into 2 groups using computer generated randomized table.

Inclusion criteria:

1. Age >12 years to 70 years
2. Patients willing to give informed consent
3. All patients with clinical features of allergic rhinitis coming to ENT OPD at H.S.K Hospital

Exclusion criteria:

1. Intranasal abnormality like nasal polyposis
2. Co-existing upper airway infection or uncontrolled systemic diseases
3. Use of intranasal steroid or oral antihistamine within one month of presentation to OPD
4. Nasal surgery within past one month
5. Pregnant or lactating women

Informed consent was taken from all the patients for the study. Proper history taking, clinical examination were done. They were randomized to one of the treatment modalities using computer generated randomized table. Group A is intranasal fluticasone spray (50 mcg) 2 puffs in each nostril once daily and Group B is combination of intranasal fluticasone propionate spray (50 mcg) 2 puffs in each nostril once daily with oral levocetirizine 10 mg once daily for 4 weeks. Response was evaluated at weekly intervals for their symptomatic improvement at 1st, 2nd and 4th week using nasal symptom score. Symptoms evaluated included nasal obstruction, nasal discharge, sneezing and itching. Each symptom was evaluated individually and total symptom score was calculated as the sum of four nasal symptoms. Symptoms were scored as: 0= no symptom; 1= mild (symptom present but not troublesome); 2= moderate (symptom is frequently troublesome but does not interfere daily activity or sleep); 3= severe (symptoms that interfered with daily activity and sleep). This results in a total score of 0 -12. Pretreatment score was assessed and later at each follow up visits. Statistical analysis was performed with the help of open epi software version 2.3.1 using Post Hoc Dunnett's test with ANOVA. A p value <0.05 was considered statistically significant.

RESULTS:

Among the 40 patients who enrolled for the study, 21 (52.5%) were males and 19 (47.5%) were 107 females (Table 1). The age group ranged from 12 to 70 years with mean age of presentation as 34.9 years (Table 2). In 20 patients (50%) intranasal fluticasone spray was given

and in another 20 patients (50%) combination of intranasal fluticasone spray with oral levocetirizine was given. No serious adverse events occurred. Before treatment, total symptom score in group A and group B was 7.6 and 9.25 respectively. After treatment (4th week), total symptom score was reduced to 0.8 in group B with 70.41% reduction. Both group A and group B in the first, second and third visit showed improvement in terms of total nasal symptom score compared with their pre-treatment scores, which was statistically significant ($p=0.001$). We observed patients in intranasal fluticasone with oral levocetirizine group had better improvement compared to the intranasal fluticasone spray alone in the 3rd visit, which was statistically significant ($p=0.002$).

Table 1. Sex distribution (n=40)

MALE	FEMALE
21	19

In our study, males were 21 (52.5 %) in number and females were 19 (47.5%)

Table 2. Age distribution (n=40)

AGE GROUP IN YEARS	NO OF PATIENTS
12-20	8
21-30	13
31-40	8
41-50	3
51-60	5
61-70	3

In the above table; age group of 21-30 years were more commonly presented and 61-70 years least common

Table 3. Symptom score improvement p value < 0.02- statistically significant

TNSS SCORE	GROUP A	GROUP B	P VALUE
Pre treatment	7.6 ± 2.87	9.25 ± 1.65	
1st week	5.3 ± 2.18	4.9 ± 1.41	0.49
2nd week	4.2 ± 2.19	3.2 ± 2.07	0.14
4th week	2.65 ± 2.25	0.8 ± 1.28	0.002
P value	0.001	0.001	

DISCUSSION:

Allergic rhinitis is a chronic upper airway disease of increasing prevalence and it remains an important healthcare problem⁹. It is an Ig E mediated type I hypersensitivity reaction involving nasal mucosa after an allergen exposure. Allergic reactions occur when a person's immune system reacts abnormally to normally harmless substance present in the environment. There are a number of predisposing factors including age; common during adolescence. In patients with allergic rhinitis, histamine causes the acute symptoms of sneezing, itching, rhinorrhea, and to a lesser extent, congestion experienced during the early phase response¹⁰.

Based on Allergic rhinitis and its Impact on Asthma (ARIA) guidelines revised in 2010 for pharmacological treatment, intranasal glucocorticoids are strongly recommended for the treatment of allergic rhinitis⁹. Intranasal corticosteroid preparations can relieve symptoms of rhinitis by decreasing capillary permeability and mucous secretions in addition to reducing the numbers of inflammatory cells and chemical mediators in nasal secretions¹¹. It shows a delayed onset of action (12-24hrs) and maximal effect of topical steroids is observed in 1-2 weeks. The onset of action of oral antihistamines is fast within 1-3 hrs. They have shown to be effective on ocular as well as nasal symptoms with the exception of nasal congestion¹² and so can be paired with intranasal steroid spray.

Pinar et al⁷ in their open study observed monotherapy with intranasal corticosteroid as well as its combination with oral antihistamines and leukotriene receptor antagonist led to a statistically significant improvement in quality of life in allergic rhinitis patients when compared to control group. This suggests there is benefit from add on therapies rather than topical steroid alone. In another study conducted by Robert et al⁵, combination therapy with intranasal steroid spray and an oral H1 antihistamine provided benefits similar to intranasal steroid monotherapy for symptoms of seasonal allergic rhinitis. A recent meta-analysis by Benninger et al.¹³ reported that, although intranasal steroid spray produced greater improvements in nasal symptoms in patients

with seasonal allergic rhinitis, oral antihistamines may be just as effective for some patients with perennial allergic rhinitis. Ratner et al¹⁴ in their study observed that the addition of an oral antihistamine to an intranasal steroid spray was superior to intranasal steroid spray alone for some patient-rated symptoms in allergic rhinitis.

In our study, statistically significant symptom improvement was noticed with combination therapy of intranasal fluticasone propionate spray with oral levocetirizine in the 3rd visit when compared to intranasal fluticasone propionate spray alone. The efficacy of study drugs was assessed by total nasal symptom score.

CONCLUSIONS:

Both the groups showed significant therapeutic benefit in patients with allergic rhinitis. This study supports the efficacy of intranasal fluticasone spray and intranasal fluticasone spray with oral levocetirizine in the treatment of allergic rhinitis and the superiority of combination group compared with monotherapy in improvement of symptoms.

Consent for publication - All participants consent for publication.

Competing interests: The authors declare that they have no competing interests.

REFERENCES:

- Watkinson JC, Clarke RW, editors. Scott-Brown's otorhinolaryngology head & neck surgery. 8th ed. vol S1; CRC Press; 2008. p.999.
- Ziade, G. K., Karami, R. A., Fakhri, G. B., Alam, E. S., Hamdan, A. L., Mourad, M. M., & Hadi, U. M. (2016). Reliability assessment of the endoscopic examination in patients with allergic rhinitis. *Allergy & Rhinology*, 7(3), ar-2016
- Pinar, E., Eryigit, O., Oncel, S., Calli, C., Yilmaz, O., & Yuksel, H. (2008). Efficacy of nasal corticosteroids alone or combined with antihistamines or montelukast in treatment of allergic rhinitis. *Auris Nasus Larynx*, 35(1), 61-66.
- Seresirikachorn, K., Chitsuthipakorn, W., Kanjanawasee, D., Khattiyawittayakun, L., & Snidvongs, K. (2018, October). Effects of H1 antihistamine addition to intranasal corticosteroid for allergic rhinitis: a systematic review and meta-analysis. In *International Forum of Allergy & Rhinology* (Vol. 8, No. 10, pp. 1083-1092).
- Anolik, R., & Mometasone Furoate Nasal Spray With Loratadine Study Group. (2008). Clinical benefits of combination treatment with mometasone furoate nasal spray and loratadine vs monotherapy with mometasone furoate in the treatment of seasonal allergic rhinitis. *Annals of Allergy, Asthma & Immunology*, 100(3), 264-271.
- Bousquet, J., Van Cauwenberge, P., & Khaltaev, N. (2001). Allergic rhinitis and its impact on asthma. *Journal of allergy and clinical immunology*, 108(5), S147-S334.
- Kaszuba, S. M., Baroody, F. M., deTineo, M., Haney, L., Blair, C., & Naclerio, R. M. (2001). Superiority of an intranasal corticosteroid compared with an oral antihistamine in the as-needed treatment of seasonal allergic rhinitis. *Archives of internal medicine*, 161(21), 2581-2587.
- Bachert, C., & El-Akkad, T. (2002). Patient preferences and sensory comparisons of three intranasal corticosteroids for the treatment of allergic rhinitis. *Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology*, 89(3), 292-297.
- Kim, C. H., Kim, J. K., Kim, H. J., Cho, J. H., Kim, J. S., Kim, Y. D., ... & Yoon, J. H. (2015). Comparison of intranasal ciclesonide, oral levocetirizine, and combination treatment for allergic rhinitis. *Allergy, asthma & immunology research*, 7(2), 158-166.
- Saengpanich, S., deTineo, M., Naclerio, R. M., & Baroody, F. M. (2003). Fluticasone nasal spray and the combination of loratadine and montelukast in seasonal allergic rhinitis. *Archives of Otolaryngology-Head & Neck Surgery*, 129(5), 557-562.
- Tai, C. J., & Wang, P. C. (2003). Comparisons of two intranasal corticosteroid preparations in treating allergic rhinitis. *Otolaryngology-Head and Neck Surgery*, 129(5), 518-525.
- Ford, L. B., Matz, J., Hankinson, T., Prillaman, B., & Georges, G. (2015, July). A comparison of fluticasone propionate nasal spray and cetirizine in ragweed fall seasonal allergic rhinitis. In *Allergy & Asthma Proceedings* (Vol. 36, No. 4).
- Benninger, M., Farrar, J. R., Blaiss, M., Chipps, B., Ferguson, B., Krouse, J., ... & Kaliner, M. (2010). Evaluating approved medications to treat allergic rhinitis in the United States: an evidence-based review of efficacy for nasal symptoms by class. *Annals of Allergy, Asthma & Immunology*, 104(1), 13-29.
- Ratner, P. H., Van Bavel, J. H., Martin, B. G., Hampel, F. C., Howland, W. C., Rogenes, P. R., ... & Cook, C. K. (1998). A comparison of the efficacy of fluticasone propionate aqueous nasal spray and loratadine, alone and in combination, for the treatment of seasonal allergic rhinitis. *Journal of family practice*, 47(2), 118-126.