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Original Research Article

Efficacy of intranasal olopatidine hydrochloride as an add on therapy in mild to moderate allergic rhinitis

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ABSTRACT

Background: Treatment with intranasal olopatidine hydrochloride spray is proposed for patients with chronic perennial and seasonal rhinitis. Hence we compared the efficacy of intranasal mometasone furoate as an add-on therapy with existing standard treatment in a randomized, open label comparative study.

Methods: A prospective, randomized, single blinded, comparative study in patients with chronic perennial and seasonal rhinitis. Patients were divided into two groups to receive intranasal olopatidine therapy and intranasal saline plus existing standard treatment with levocetirizine and vitamin C orally. Improvement in symptoms like nasal obstruction, nasal discharge, sneezing, nasal itching, itching of eyes, watering of eyes were assessed by a questionnaire at 2, 4, 6 and 8 weeks and by a reduction of eosinophil count in blood and nasal smear examination at baseline and 8 weeks.

Results: At the end of 8 weeks the percentage reduction of nasal obstruction in olopatidine hydrochloride and saline were 93.1% and 36.07% respectively, rhinorrhoea was 90.34% and 36.42%, nasal itching was 85.76% and 41.37% sneezing symptoms were 89.6% and 37.86%, itching in the eyes was 94.6% and 44.05% and watering in the eyes were 87.1% in group A and 38.07% in group B. At the end of 8 weeks, there was reduction in absolute eosinophil count and it attributed to 57.5% in olopatidine hydrochloride and 11.9% in saline group and reduction in nasal smear count scoring was 60.7% and 18.2% respectively.

Conclusions: Intranasal olopatidine hydrochloride is highly effective, in the treatment of allergic rhinitis.

Keywords: Allergic rhinitis, Eosinophil count, Olopatidine hydrochloride, Saline drops

INTRODUCTION

Allergic rhinitis is defined as symptoms of sneezing, clear nasal discharge, nasal pruritus, airflow obstruction and watering of eyes against inhaled allergens and involving mucosal inflammation. These symptoms should not be confused with common cold, which is usually preceded by a viral infection. With or without any provoking factors allergic rhinitis may develop. Prevalence of allergic rhinitis worldwide is 15 to 30% of population between age 20 to 40 years.¹

In India it is >40% in this age group. It occurs commonly occurs in the second to fourth decade. Seasonal variations also play a crucial role as this condition is common during winter. No sexual predisposition is evident. Allergic rhinitis coexists with asthma and other allergic diseases. Most people with asthma have allergic rhinitis.

It is confirmed by absolute eosinophil count and history of symptoms to allergen exposure. Some patients may show a rise in serum IgE level.

Allergic rhinitis is a disorder that can affect productivity and quality of life. Allergic rhinitis is characterized by rhinorrhoea, sneezing, itching, nasal congestion, nasal hypersensitivity and inflammatory cells in the nasal mucosa. Prevalence of allergic rhinitis varies from population to population, but on an average, it can affect 20% to 30% of people. Its high prevalence, association with an impaired quality of life, and the presence of comorbidities make this disorder to be treated efficiently. Physical and social functioning is impaired because of the medical care expenditure and burden of this disease. There is a possibility of prolonged drug intake also and self-medication and over the counter medication is common.

We should understand the pathophysiology of allergic rhinitis before treating this condition. Activation of mast cells by antigen-IgE interaction releases inflammatory mediators. The primary mediator of this disease is histamine and it plays a prominent role. H₁-receptor antagonists are used widely in the treatment of allergic rhinitis. Another important mediator of allergic rhinitis is platelet-activating factor. Platelet-activating factor causes increase in vascular permeability and vasodilatation and these contribute to the appearance of rhinorrhea and nasal congestion.

Olopatidine hydrochloride is a selective H₁-receptor antagonist which also possesses inhibitory effects on platelet-activating factor.² Olopatidine hydrochloride is highly useful for the treatment of allergic rhinitis. Other conditions which are benefitted are chronic urticaria and conjunctivitis. Olopatidine hydrochloride nasal spray decreases nasal obstruction rapidly and effectively than other oral antihistaminics.³

So this study was conducted to compare the efficacy and tolerability of olopatidine hydrochloride nasal spray as an add on therapy in patients suffering from mild to moderate allergic rhinitis by measuring serum IgE level, total and differential count of leucocytes, absolute eosinophil count and nasal smear count.⁴

METHODS

It was a prospective, randomized, single blinded, comparative study conducted at Government Stanley Medical College and Hospital, Chennai, Tamil Nadu.

Study period

This study was carried out for a period of five months from December 2015 to May 2016.

Inclusion criteria

(1) Patients between 20 to 40 years of age of both sex. (2) Patients who had symptoms of nasal discharge for at least 6 months. (3) Patients who had persistent sneezing 5 in early morning for 6 months. (4) Patients who had

eosinophilia in their blood and nasal cytology >1+, with absolute eosinophil count > 350 cells/ μ l.

Exclusion criteria

Patients below 20 years and above 40 years of age and who had any other systemic infections, nasal septum perforation, nasal polyp, nasal or paranasal infections within 2 weeks, nasal trauma and nasal surgery, vasomotor rhinitis, atrophic rhinitis and drug induced rhinitis, hypersensitivity to olopatidine hydrochloride, pregnant and lactating women, those who operate heavy machinery, driving motor vehicles, patients who were on CNS depressants, sedatives and hypnotics, patients who were antihistamines other than levocetirizine and patients not willing to give written informed consent.

Informed consent was obtained from all the patients. The screening procedure consisted of a detailed complete haemogram, absolute eosinophil count and x-ray paranasal sinuses.⁷ Eligible patients were between 20 to 40 years of age and their primary diagnosis was allergic rhinitis, both clinically and by elevated absolute eosinophil count and eosinophilia in blood and nasal smear examination. A total of 150 patients were screened, 120 patients whose reports showed raised absolute eosinophil count and eosinophilia were included in the study. 30 patients were excluded. The 120 patients were randomized into 2 groups. 60 patients were allotted in each group using a 1:1 ratio randomization. Informed consent was obtained from all the patients.

Ethical approval

This study was approved by the Institutional Ethics Committee of Government Stanley Medical College, Chennai, India.

Group A received olopatidine nasal spray 100 μ g/day, once daily in each nostril for 4 weeks + existing standard treatment, T. levocetirizine 5 mg HS (Hospital supply) for 14 days and T. vitamin C 500 mg OD for 14 days.

Group B received normal saline nasal spray 1 puff twice daily in each nostril for 4 weeks + existing standard treatment, T. levocetirizine 5 mg HS (Hospital supply) for 14 days and T. vitamin C 500 mg OD for 14 days.

Assessment of patients in the study included history, clinical examination, complete haemogram, absolute eosinophil count and x ray paranasal sinuses and a parental questionnaire. Patient history included age, gender, history of allergy or atopy in family and drug allergies, if any, in the past. Improvement of symptom such as nasal obstruction, nasal discharge, sneezing, nasal itching, itching of eyes, watering of eyes will be evaluated at each visit at the baseline, 2 weeks, 4 weeks, 6 weeks and 8 weeks after treatment by using a clinical scoring system ranging from 0 to 3 (0-absent; 1-occasional; 2-frequent; 3-daytime and night time symptoms). An overall total

symptom score was obtained for each patient. At the baseline and at the end of 8 weeks, the finding was estimated by absolute eosinophil count and nasal smear eosinophil count.⁸ Adverse effects like nasal bleeding and burning sensation in the nose was recorded at each visit. The outcomes that were measured in the study were the patient compliance i.e. severity of symptom relief by scoring, reduction of eosinophil count in blood and nasal smear examination and less adverse effects.⁹

Statistical analysis

The statistical analysis was performed using SPSS10 (Statistical Package for Social Sciences) for Windows version 17. Data were expressed as mean and standard deviation. Student independent ‘t’ test was used to compare quantitative data between two groups. Pearson’s chi square test is used for gender difference.

RESULTS

Trial population

Sixty patients in each group were enrolled and assigned randomly to receive olopatidine nasal spray and saline nasal spray. Mean age distribution was 30.43 for group A and 29.18 for group B, done using student independent ‘t’ test showing p=0.7417. Sex distribution using Chi square test showed p value of 1.037. All patients completed the study and there was no dropouts and all patients were followed for 8 weeks after treatment. No patients had history of cigarette smoking. Nasal smear examination was tolerated well by all the patients. There was no complications during nasal smear examination before and after treatment.

Table 1: Mean scoring of olopatidine and saline nasal spray.¹¹

Symptoms	Group A		Group B	
	Before olopatidine	After olopatidine	Before saline spray	After saline spray
Nasal obstruction	2.90	0.20	2.80	1.79
Rhinorrhoea	2.90	0.28	2.80	1.78
Nasal itching	2.60	0.37	2.90	1.70
Sneezing	2.81	0.29	2.80	1.74
Itching in eyes	2.61	0.14	2.86	1.60
Watering in eyes	2.61	0.34	2.81	1.74

At the start of the study, there was no difference between the mean of the sinonasal symptoms (nasal obstruction, nasal discharge, sneezing, nasal itching, itching of eyes, watering of eyes) between the two treatment groups. The mean value of nasal obstruction scoring in group A was 2.9 and in group B was 2.8 in the baseline (p value=0.366; not significant). At the end of 8th week, mean value of nasal obstruction scoring in group A was 0.20 and in group B was 1.79 (p value=0.0000, is significant). The mean value of rhinorrhoea scoring in group A was 2.9 and in group B was 2.8 in the baseline (p value=0.267; not significant). At the end of 8th week, mean value of rhinorrhoea scoring in group A was 0.28 and in group B was 1.78 (p value =0.0000, was significant). The mean value of nasal itching scoring in group A was 2.60 and in group B was 2.90 in the baseline (p value=0.0171 was significant). At the end of 8th week, mean value of nasal itching scoring in group A was 0.37 and in group B was 1.71 (p value=0.0000, was significant). The mean value of sneezing scoring in group A was 2.81 and in group B was 2.80 in the baseline (p value =0.742; not significant). At the end of 8th week, mean value of sneezing scoring in group A was 0.29 and in group B was 1.74 (p value=0.0000, was significant). The mean value of itching in eyes scoring in group A was 2.61 and in group B was 2.86 in the baseline (p value =0.143; not significant). At the end of 8th week, mean value of itching in eyes scoring in group A was 0.14 and in group B was

1.60 (p value=0.0000, was significant). The mean value of watering in eyes scoring in group A was 2.61 and in group B was 2.81 in the baseline (p value =0.0168 iwas significant). At the end of 8th week, mean value of watering in eyes scoring in group A was 0.34 and in group B was 1.74 (p value=0.0000, was significant).

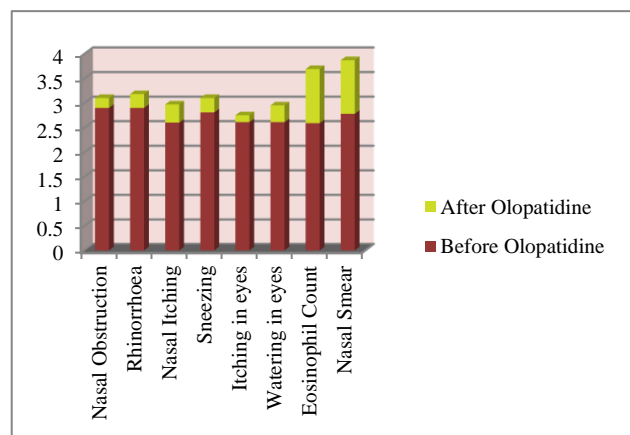


Figure 1: Group A- olopatidine results.

Table 1 summarizes the comparison of means of symptom scoring of patients of two groups. There was significant improvement in symptom scoring from 2 weeks and upto

8 weeks. Analysis of symptoms revealed all symptoms improved significantly with the use of olopatidine compared to saline nasal spray. The mean value of absolute eosinophil count scoring in group A was 2.59 and in group B was 2.67 in the baseline (p value=0.587; not significant).

At the end of 8th week, mean value of absolute eosinophil count scoring was 1.10 in group A and group B was 2.35 (p value=0.0000; significant).¹² The percentage reduction from the absolute eosinophil count scoring at the end of 8th week was 57.5% in group A and 11.9% in group B.

Table 2: Eosinophil count scoring.

Criteria	Group A		Group B	
	Before olopatidine	After olopatidine	Before saline spray	After saline spray
Absolute eosinophil count	2.59	1.10	2.61	2.30

Table 3: Nasal smear count scoring.

Criteria	Group A		Group B	
	Before olopatidine	After olopatidine	Before saline spray	After saline spray
Nasal smear count	2.59	1.10	2.61	2.30

The mean value of nasal smear examination scoring in group A was 2.78 and in group B was 2.80 in the baseline (p value =0.476; not significant).¹³ At the end of 8th week, mean value of nasal smear examination scoring was 1.09 in group A and group B was 2.29 (p value=0.0000; significant). The percentage reduction from the nasal smear examination scoring at the end of 8th week was 60.7% in group A and 18.2% in group B.

Adverse events

In group A, one patient had disturbances of taste and one patient had nausea. In group B, four patients had disturbances of taste, two patients had nasal discharge, three patients had nausea, two patients had headache.

DISCUSSION

Treating the symptoms of allergic rhinitis and ensuring an improvement in quality of life to the patients is challenging to the doctors as most of the oral antihistaminics produce drowsiness and sedation that will limit the day to day activities. After the introduction of topical antihistamines, the adverse effects of oral antihistaminics are well reduced. Olopatadine have already known to be effective in allergic rhinitis but this study was conducted in a tertiary hospital on a population which was most exposed to air pollution like industrial allergens and automobile smoke.

Compared to many other previous studies done in olopatidine nasal spray, which used another drug like mometasone, a nasal topical steroid in the comparator arm or used rupatidine a second generation anti histamine in the comparator arm.^{14,15} This study was exclusively done with olopatidine in the test group and conventional treatment used for allergic rhinitis in the control group. So no placebos were used. Saline spray was given in the study along with conventional antihistaminics. So the problem of treatment denial was overcome in the control group.

Allergic conditions usually affect the eosinophil count. Increases in eosinophil count both differential count and absolute eosinophil count, which is present in allergic rhinitis, is reduced significantly.¹⁶ Treatment with olopatadine hydrochloride nasal spray has proved to reduce IgE levels significantly. In this study the reduction in mean value was 1.1 in olopatidine group compared to 2.30 in Saline group. The percentage reduction in the absolute eosinophil count scoring at the end of 8th week was 57.5% in olopatidine group and 11.9% in saline group which was significant.

Similarly the mean value of nasal smear examination scoring in olopatidine group was 2.78 and in saline group was 2.80 in the baseline.¹⁷ At the end of 8th week, mean value of nasal smear examination scoring was 1.09 in olopatidine group and saline group was 2.29 (p value =0.0000; significant). The percentage reduction in the nasal smear examination scoring at the end of 8th week was 60.7% in olopatidine group and 18.2% in saline group.

As allergic rhinitis affects quality of life, it is important to ensure a decent quality of life and reduction in symptoms and consequently misuse of antibiotics is prevented.

This study has some limitations. First, this study was conducted in patients in the adult age group. Adolescents, paediatric and elderly age group was excluded from the study. Second, patients with seasonal allergic rhinitis showed a good response, whereas perennial allergic rhinitis patients showed less compliance. Third, patients with mild to moderate symptoms only were included, more studies are required to see the response in severe allergic rhinitis.

CONCLUSION

From this study, it is concluded that intranasal olopatidine hydrochloride is an effective alternative to oral

antihistaminics in the management of mild to moderate allergic rhinitis.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Government Stanley Medical College, Chennai, India

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