ORIGINAL ARTICLE

LEVOCETRIZINE AND DESLORATADINE: COMPARATIVE EFFICACY IN PATIENTS WITH ALLERGIC RHINITIS

Shimal Khan, Muhammad Ismail Khan, Asmatullah Khan, Amjad Abrar
Department of Pharmacology and ENT, Gomal Medical College, D.I.Khan, Pakistan

ABSTRACT

Background: Antihistamines are the most commonly prescribed class of medication for allergic rhinitis. The objective of this study was to compare efficacy of levocetrizine and desloratadine in once daily dosage in patients suffering from allergic rhinitis. **Methods:** This study was carried out from 1st January 2011 to 31st December 2011, in Department of ENT and Pharmacology, Gomal Medical College D.I.Khan. Patients of >12 years age with symptomatic allergic rhinitis attending ENT OPD were included. They were divided in two groups. Group A was given levocetrizine 5 mg once daily and Group B desloratadine 5 mg once daily. Data was collected at first visit prior to medication, second visit 2 weeks and third at 4 weeks. Total-4 nasal symptoms score (rhinorrhoea, sneezing, nasal itching, and nasal obstruction) were compared. **Results:** A Total 140 patients were included; 42 males and 28 females in group A while 52 males and 18 females in group B. Mean age in group A was 27.4±9.3 while in group B 27.5±8.9 years. Total-4 nasal symptoms score was 13-14 in 76% patients at visit 1 in levocetrizine group that improved to 6-7 in 25% and 4-5 in 70% patients at visit 2 and 3 respectively. Patients receiving desloratadine had 13-14 in 58% at visit 1 with an improvement to 4-5 in 21% and 65% at visits 2 and 3 respectively. **Conclusion:** There is no difference between levocetrizine and desloratadine in relieving individual symptom score in symptomatic allergic rhinitis.

KEY WORDS: Allergic rhinitis, Levocetrizine, Desloratadine.

INTRODUCTION

Allergic rhinitis (AR) is the most common allergic disease worldwide and affects about 18% to 40% of the general population. A large segment of our population particularly young adults are suffering from AR.[1] Despite the debilitating effects of AR, it remains a condition where patients do not seek appropriate treatment, are undertreated, or do not adhere to treatment; all of which lead to high social costs.[2] Antihistamines are the mainstay of treatment and are recommended for all types of intermittent and persistent allergic rhinitis.[3] Compared with older antihistamines, newer antihistamines (third generation) have rapid onset of action (minutes to hours), are easy to use, and are highly effective on symptoms such as rhinorrhoea, sneezing, and nasal pruritis. They are mostly free of anticholinergic adverse effects and relatively safe compared with first generation antihistamines, even in population groups such as the elderly.[4] Levocetrizine, a highly selective H1 antihistamine, which has additional benefits of nasal decongestion, improving nasal airflow and is cost effective.[5,6] Desloratadine is a potent, nonsedating antihistamine with anti-inflammatory properties.[7] Desloratadine has also been found to improve nasal airflow in patients with AR. The proven ability of desloratadine to prevent recruitment of cytokines, chemokines, and cellular adhesion molecules associated with late-phase response may contribute to the decongestant properties.[8]

Limited comparative studies are available on newer antihistamines at national level. The goal of present study was thus to compare the efficacy of a once daily dose of levocetrizine or desloratadine in patients with AR.

MATERIAL AND METHODS

This randomized, prospective study was conducted on 140 patients of both genders and age ≥ 12 years with a minimum 2 years history of allergic rhinitis presenting in the outdoor department of ENT Mufti Mehmood Memorial Teaching Hospital and Department of Pharmacology, Gomal Medical College Dera Ismail Khan from 1st January 2011 to 31st December 2011. Patients with history of urticaria, bronchial asthma that required medical therapy, nasal polyps, pregnancy and lactation, chronic diseases that could impact the study outcome (renal, hepatic or cardiac disease), patients who had received topical or systemic steroids

within the last four weeks and those who have had an upper respiratory tract or sinus infection within 14 days of commencement of the study were excluded from the study. Similarly patients who received antihistamines (desloratadine, loratadine, levocetrizine, cetrizine, fexofenadine) within last 10 days, ketotifen within 2 weeks and leukotriene antagonists within 3 days of commencement of study were excluded. Sedative / hypnotics and antiallergic treatment other than the study medication, were all prohibited during the study period. Informed consent was taken from all the patients.

Patients were divided into two groups by non-probability (convenience) sampling. Patients in group A were given levocetrizine 5mg once daily while patients in group B were given desloratadine 5mg once daily for a period of four weeks. Data was collected at first visit prior to medication use, on second visit two weeks after medication use and on third visit four weeks after medication use. At each visit patient medication history was reviewed, nasal symptoms assessment and anterior rhinoscopy was done. Patients were evaluated for nasal itching, rhinorrhoea and sneezing on a four-point scale as; 1=absent, 2=mild, 3=moderate, 4=severe, while two-point scale was used to assess nasal obstruction as; 1=absent and 2=present. Total four nasal symptoms score (TNSS) (rhinorrhoea, sneezing, nasal itching, and nasal obstruction) was calculated by adding scores of all three variables. Efficacy was determined not only on the basis of individual variable score but also on TNSS (sum of all four variables). Lower the score more effective will be the drug.

All data was analyzed using SPSS 15 for windows. Categorical variables were expressed as frequencies and percentages while continuous variables were expressed as mean ± SD. Comparative analysis between the two groups was done using chi-square ($\div^2$) test. P value of <0.05 was considered as significant.

RESULTS

A total of 140 patients were included in the study in which 94 (67.2%) were males and 46 (32.8%) females. There were 42(60%) males and 28(40%) females in group A while group B consisted of 52(74%) males and 18(26%) females. Mean age of the study population in group A was 27.4±9.3 years while the mean age of patients in group B was 27.5±8.9 years, Table 1. The symptoms of nasal obstruction were completely relieved in 64.3% in group A as compared to 42.85% patients in group B. Complete resolution of individual symptoms of rhinorrhoea, sneezing and nasal itching at visit 3 occurred in 65.7%, 62.85% and 34.3% patients respectively in group A receiving levocetrizine. While patients in group B receiving desloratadine 54.3%, 57.15% and 28.6% had complete resolution of symptoms of rhinorrhoea, sneezing and nasal itching. Overall cure rate was found to be low in both groups. Complete resolution of symptoms was achieved only in 10 (14.3%) patients in group A receiving levocetrizine and 8 (11.4%) patients in group B receiving desloratadine. Persistent rhinorrhoea, sneezing and nasal itching of mild severity was present in 46 (32.85%), 48 (34.3%), and 65 (46.4%) patients in total study population at visit 3 with statistically no significant difference between the two groups. Seven subjects in each treatment group reported adverse events. The most frequent treatment-re-

Table 1: Baseline characteristics of the study population.

	Group A n=70(%)	Group B n= 70(%)
Age mean (years)	27.4±9.3	27.5±8.9
Male	42(60%)	52(74%)
Female	28(40%)	18(25%)

Table 2: Symptoms of patient at first visit before medicine use.

Symptoms	Group A	Group B	P value
Rhinorrhoea			
No	7(5.0)	8(5.7)	
Mild	26(18.6)	15(10.7)	**0.234**
Moderate	23(16.4)	28(20.0)	
Severe	14(10.0)	19(13.6)	
Sneezing:			
No	2(1.4)	4(2.9)	
Mild	15(10.7)	8(5.7)	**0.285**
Moderate	30(21.4)	28(20.0)	
Severe	23(16.4)	30(21.4)	
Nasal itching			
No	5(3.6)	6(4.3)	
Mild	17(12.1)	10(7.1)	**0.519**
Moderate	19(13.6)	21(15.0)	
Severe	29(20.7)	33(23.6)	
Nasal obstruction			
Present (1)	28(20.0)	18(12.9)	**0.052**
Absent (0)	42(30.0)	52(37.1)	

The values in parentheses are the percentages

lated adverse events during levocetrizine group were dry mouth (n=3), headache (n=2), and somnolence (n=2). While in desloratadine group, the most frequent treatment-related adverse events were headache (n=2), dry mouth (n=2) and somnolence (n=3).

Patient receiving levocetrizine had better control of symptoms as compared to patients receiving desloratadine; however this difference was not statistically significant. (Table 2-4)

Table 3: Symptoms of patient at second visit 2 weeks after medicine use.

Symptoms	Group A	Group B	P value
Rhinorrhoea			
No	32(22.9)	27(19.3)	
Mild	19(13.6)	19(13.6)	**0.617**
Moderate	15(10.7)	16(11.4)	
Severe	4(2.9)	8(5.7)	
Sneezing:			
No	16(11.4)	14(10.0)	
Mild	34(24.3)	25(17.9	**0.224**
Moderate	16(11.4)	22(15.7)	
Severe	4(2.9)	9(6.4)	
Nasal itching			
No	27(19.3)	29(20.7)	
Mild	22(15.7)	15(10.7)	**0.253**
Moderate	15(10.7)	23(16.4)	
Severe	6(4.3)	3(2.1)	
Nasal obstruction			
Present (1)	45(32.1)	42(30.0)	**0.364**
Absent (0)	25(17.9)	28(20.0)	

The values in parentheses are the percentages

Table 4: Symptoms of patient at third visit 4 weeks after medicine use.

Symptoms	Group A	Group B	P value
Rhinorrhoea			
No	41(29.3)	39(27.9)	
Mild	23(16.4)	15(10.7)	**0.093**
Moderate	5(3.6)	12(8.6)	
Severe	1(0.7)	4(2.9)	
Sneezing:			
No	38(27.1)	27(19.3)	
Mild	24(17.1)	29(20.7)	**0.228**
Moderate	6(4.3)	12(8.6)	
Severe	2(1.4)	2(1.4)	
Nasal itching			
No	36(25.7)	39(27.9)	
Mild	25(17.9)	18(12.9)	**0.121**
Moderate	4(2.9)	11(7.9)	
Severe	5(3.6)	2(1.4)	
Nasal obstruction			
Present (1)	54(38.6)	57(40.7)	**0.339**
Absent (0)	16(11.4)	13(9.3)	

The values in parentheses are the percentages

DISCUSSION

Allergic rhinitis is a major health problem with high and ever-increasing prevalence. At least one in five adults in Western Europe are estimated to have AR, and its well-known nasal symptoms can be severe enough to have a substantial negative impact on daily activities and sleep, with resultant impairment of quality of life similar to that caused by asthma.[9] Published data on the prevalence of allergic diseases and their treatment with drugs is lacking in Pakistan.[10] Allergic rhinitis if left untreated, a chronic state of nasal inflammation accompanied by nasal obstruction can develop and lead to sinusitis, otitis media with effusion, nasal polyps, and asthma.[11] Antihistamines were introduced more than 50 years ago for the treatment of allergic rhinitis.[12] Compared with older antihistamines, newer anti-histamines have rapid onset of action, are easy to use, highly effective, and are mostly free of anticholinergic effects and relatively safe. Furthermore, the newer agents are comparatively nonsedating, thus providing further benefit over older antihistamines with sedatives properties that are no longer recommended in adults or children.[4]

The results of the present study showed that levocetrizine and desloratadine both were effective in relieving most of the symptoms of AR and there was no statistically significant difference between two groups. However levocetrizine showed an overall better response as compared to desloratadine after 4 weeks of therapy. Similar results were also reported in a study by Ciprandi et al,[5] which showed that levocetrizine produces better symptom relief and improves nasal airflow in patients with allergic rhinitis. In a study by de Blic et al[13] levocetrizine was superior to placebo in children with allergic rhinitis. Day et al[14] in a study

also reported that levocetrizine is better than desloratadine in symptoms control and in alleviating nasal obstruction. In a study by Deruaz et al[15] levocetrizine was better in controlling symptoms on nasal provocation testing with grass pollen.

In a 6 week comparative trial of levocetrizine 5mg or desloratadine mg alone or in combination with montalukast in patients with persistent allergic rhinitis by Ciebiada et al[16] there was found no statistically significant difference between the two drugs although levocetrizine was slightly more efficacious overall than desloratadine in controlling symptoms of allergic rhinitis.

Popoy et al[17] and Wilson et al[18] found levocetrizine an effective tool not only for immediate shot-term allergic manifestations but also for long-term symptomatic relief. This finding is in agreement with our findings where levocetrizine showed greater reduction in TNSS in significantly more patients than that shown by desloratadine at visit 3 (four weeks after therapy). In a study by Bousquet et al[19] desloratadine was found efficacious at day 1 and it continued throughout the study for 14 days. This is contrary to our observations.

In our study there was remarkably poor overall control rate in both groups. Complete resolution of symptoms was achieved only in 10 (14.3%) patients receiving levocetrizine and 8 (11.4%) patients taking desloratadine. Persistent mild rhinorrhoea and sneezing was reported in 46 (32.85%) and 48 (34.3%) patients respectively in total study population. These results are comparable with the results reported by Bashir et al, in which levocetrizine was compared with fexofenadine in allergic rhinitis.[20] This low cure rate was probably because of the use of monotherapy. Combination therapy with addition of local and/or systemic decongestants, local steroid, or a mast cell stabilizer is mere effective strategy than monotherapy in the treatment of allergic rhinitis in patients with moderate-to-severe symptoms.[21] We in our study not only assessed the beneficial antihistaminic effects of both the drugs but also the side effects of them as well. We found few side effects with both drugs although of less severity. A study conducted by Walker s et al in United Kingdom in teenagers found that symptomatic allergic rhinitis and antihistamines use are associated with significantly increased risk of unexpectedly dropping a grade in summer examinations.[22] This was attributed not only to disease impact on quality of life but also to sedative effects of antiallergic medicines.[11]

CONCLUSION

The study revealed statistically no significant difference between levocetrizine and desloratadine in relieving individual symptom score in symptomatic allergic rhinitis patients.

REFERENCES

1. Utah S, Niazi SA, Alditar MR. Allergins in allergic rhinitis. Pak Armed Forces Med J 2005; 55:126-8.
2. Schoenwetter WF, Dupclay L, Jr, Appajosyula S, Botteman MF, Pashos CL. Ecconomic impact and quality of life burden -of allergic rhinitis. Curr Med Res Opin. 2004; 20:305-17.
3. Simons FE. Advances in H1-Antihistamines. N Engl J Med. 2004; 351:2203-17.
4. Hansen J, Klimek L, Hormann K. Pharmacological management of allergic rhinitis in the elderly: safety issues with oral antihistamines. Drugs Aging. 2005; 22:289-96.
5. Ciprandi G, Cirillo I, Vizzaccaro A, Tosca MA. Levocetrizine improve nasal symptoms and airflow in patients with persistent allergic rhinitis; a pilot study. Allerg Immunol 2005; 37:25-9.
6. Bousquet J, Demarteau N, Mullol J, Van Daymme, VanGee, Bachert C. Costs associated with persistent allergic rhinitis are reduced by levocetrizine. Allergy 2005; 60:788-94.
7. Berger WE. The safety and efficacy of desloratadine for the management of allergic disease. Drug Saf 2005; 28:1101-8.
8. Scaddding GK. Desloratadine in the treatment of nasal congestion in seasonal allergic rhinitis: Preclinical and clinical evidence. Clin Drug Invest 2002; 22:21-32.
9. Bauchau V, Durham SR. Prevalence and rate of diagnosis of allergic rhinitis in Europe. Eur Respir J 2004; 24:758-64.
10. Pfaar O, Raap U, Holz M, Hormann K, Klimek. Pathophysiology of itching and sneezing in allergic rhinitis. Swiss Med Wkly 2009; 139: 35-40.
11. Dhanya NB, Thasleem Z, Rai R, Srinvas CR. Comparative efficacy of levocetrizine, desloratadine, and fexofenadine by histamine wheal suppression test. Indian J Dermatol Venereol Leprol 2008; 74:361-3.
12. Bender BG, Berning S, Dudden R, Milgram H, Tranz ZV. Sedation and performance impairment of diphenhydramine and second generation antihistamines: a meta-analysis. J Allergy Clin Immunol 2003; 111:770-68.
13. de Blic J, Wahn U, Billard E, Alt R, pujazon MC. Levocetrizine in children: evidenced efficacy and safety in a 6-week randomized seasonal allergic rhinitis trial. Pediatr Allergy Immunol 2005; 16:267-75.
14. Day JH, Briscoe MP, Rafeiro E, Ratz JD. Comparative clinical efficacy, onset and duration of

action of levocetrizine and desloratadine for symptoms of seasonal allergic rhinitis in subjects evaluated in the Environmental Exposure Unit (EEU). Int J Clin Pract 2004; 58:109-18.

15. Deruaz C, Leimgruber A, Berney M, Pradevand E, Spertini F. Levocetrizine better protects than desloratadine in a nasal provocation with allergin. J Allergy Clin Immunol 2004; 113:669-76.
16. Ciebiada M, Gorska-Ciebiada M, DuBuske LM, Gorski P. Montelukast with desloratadine or levocetrizine for the treatment of persistent allergic rhinitis. Ann Allergy Asthma Immunol 2006; 97:664-71.
17. Popoy TA, Dumitrascu D, Bachvarova A, Bocsan C, Dimitrov V, Church MK. A comparison of levocetrizine and desloratadine in the histamine-induced wheal and flare response in human skin in vitro. Inflamm Res. 2006; 55:241-44.
18. Wilson AM, O,Byrne PM, Parameswaran K. Leukotriene receptor antagonists for allergic rhinitis: a systematic review and meta-analysis. Am J Med 2004; 116: 338-44.
19. Bousquet J, Bachert C, Canonica GW, Mullol J, Van Cauwenberge P, Bindslev Jensen C. Efficacy of desloratadine in intermittent allergic rhinitis: a GA2LEN study. Allegy 2009; 64:1516-23.
20. Bashir H, Khawar A, Hussain A. Comparison of efficacy of levocetrizine and Fexofenadine in patients with symptomatic allergic rhinitis. Pak J of Otolaryngol 2011; 27:66-8.
21. Ciebiada M, Gorska-Ciebiada M, Kmiecik T, DuBuske LM, Gorski P. Quality of life in patients with persistent allergic rhinitis treated with montelukast alone or in combination with levocetrizine or desloratadine. J Investig Allergol Clin Immunol 2008; 18: 343-439.
22. Walker S, Khan-Wasti S, Fleteher M, Cullinan P, Harris J, Sheikh A. Seasonal allergic rhinitis is associated with a detrimental effect on examination performance in United Kingdom teenagers: case-control study. J Allergy Clin Immunol 2007; 12: 381-7.

Corresponding author:

Dr. Shimal Khan

Department of Pharmacology

Gomal Medical College

D.I.Khan, Pakistan

E-mail: drshimal@hotmail.com