ORIGINAL ARTICLE

Efficacy of Bilateral Inferior Turbinoplasty in Non-Obstructive Allergic Rhinitis: A Quasi-Experimental Study at Tertiary Care Hospital, Kohat

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ABSTRACT

Objective: To compare the efficacy of surgical treatment, i.e., bilateral inferior turbinoplasty, versus medical treatment in cases of non-obstructive allergic rhinitis.

Study Design: Quasi-experimental study.

Place and Duration of Study: The study was conducted at the ENT Department, Combined Military Hospital (CMH), Kohat, Pakistan, from January 2022 to December 2022.

Methods: Ninety patients, either male or female, aged 16 to 60 years, diagnosed with non-obstructive allergic rhinitis, were divided into two equal groups. In Group M, patients received standard medical treatment, which included antihistamines and a corticosteroid nasal spray, whereas bilateral inferior turbinoplasty was performed under general anesthesia in Group S patients. A four-parameter symptom score card was devised to evaluate all patients before the commencement of treatment and 6 months after the treatment. These four symptoms included nasal itching, runny nose, sneezing, and loss of smell. Each symptom was measured with a four-point scale, i.e., 0 score for no symptoms, 1 score for mild symptoms, 2 score for moderate symptoms, and 3 score for severe symptoms.

Results: Both groups were comparable in demographic characteristics. In group M (medical treatment), the duration of symptoms was 4.15±1.93 years, whereas for group S (surgical treatment, it was 3.84+1.35 years. An insignificant difference was observed between the two groups with respect to duration of symptoms, with a *P*-value of 0.378. In terms of pre-treatment severity of symptoms, both groups had an insignificant difference (*P*-value of 0.15). Both groups showed comparable treatment efficacy (*P*-value of 0.123). In group M, the post-treatment score was reduced to 3.22±0.9, and for group S, it was 3.6±0.65.

Conclusion: It was demonstrated in our study that surgical treatment, i.e., bilateral inferior turbinoplasty, is as effective as medical treatment in cases of non-obstructive allergic rhinitis.

Keywords: *Allergic Rhinitis, Rhinorrhea, Sneezing.*

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Introduction

Allergic rhinitis is a very common condition with very high prevalence, reaching up to 25 to 40 percent all over the world.[1,2] Same prevalence is observed in the population of Pakistan.[3] This makes it a very big health challenge not only for developed countries but more for the underdeveloped countries like Pakistan, where the medical resources are scarce, and the poor population of the country does not have the resources to cope with any chronic illness. This necessitates a treatment plan for this condition that is more effective and reduces the total number of hospital visits and the cost of treatment.

Allergic rhinitis is characterized by rhinorrhea, sneezing, nasal blockage and itching, post-nasal drip, and inflammation of the nasal mucosa.[4] Severity of the symptoms varies widely and may lead to significantly reduced performance at school or

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workplace and reduced quality of life. The pathophysiology of the disease is partially understood and involves activation of IgE-mediated mast cells, basophils, eosinophils, and T cells, resulting in release of Th2 cytokines, interleukin-4, and interleukin-5.[1]

Allergic rhinitis can affect people of any age, but it usually begins in childhood or young adulthood. Its symptoms also seem to be more severe in these age groups.[5] Allergic rhinitis can be divided into two distinct types on the basis of persistence of symptoms, i.e., seasonal and perennial.[6] Seasonal rhinitis tends to aggravate at certain times of the year, usually triggered by pollen, mold, etc.; whereas the symptoms in perennial rhinitis seem to persist throughout the year with a waxing and waning pattern.

Treatment options usually depend on the patient's age, duration of symptoms, and their severity. Common treatment options include reducing exposure to allergens and triggers, oral antihistamines, decongestant nasal sprays, and corticosteroid nasal sprays.[7] Another treatment option for allergic rhinitis includes immunotherapy. This treatment option is usually reserved for patients with severe symptoms for whom conventional treatments fail.[8] Few researchers have also tried the surgical management option. Patients with severe obstructive symptoms have been treated with bilateral inferior turbinoplasty.[9]

Few researchers have tried surgical treatment options for non-obstructive allergic rhinitis with varying degrees of success.[10] This treatment option has not been widely explored, though, especially in Pakistan. If the results are promising, then this can serve as the foremost treatment option, as the medications used for this condition have quite a few adverse effects, and many patients quit the medication for this reason. This study was done to compare the efficacy of surgical versus medical treatment. The results of this study will help clinicians devise a more effective plan for this condition.

Methods

The study was conducted at the ENT Department, Combined Military Hospital (CMH), Kohat, Pakistan, from January 2022 to December 2022. Prior approval from the Ethical Review Board was taken, vide certificate no: E-2005/A/09, dated 13th February 2022. A total of 90 patients, either male or female, with ages ranging from 16 to 60 years, diagnosed with allergic rhinitis, were recruited for this study. Patients with a deviated nasal septum, hypertrophied inferior turbinate, and nasal polyposis were excluded from this study. Patients with an allergy or contraindication to any drug used in this study were also excluded from this study. Patients with any uncontrolled chronic illness were also excluded. Informed consent was taken from the patients or their parents for participation in the study. Calculation of sample size was accomplished with the confidence level of 95%, 5% of margin of error and 6.2% population proportion.[10-11]

A non-probability consecutive sampling technique was followed. Two groups were made, and patients were assigned randomly to one group, with each group having 45 patients. A four-parameter symptom score card was devised to evaluate all patients before the commencement of treatment and 6 months after the treatment. These four symptoms included nasal itching, runny nose, sneezing, and loss of smell. Each symptom was measured with a four-point scale, i.e., 0 score for no symptoms, 1 score for mild symptoms, 2 score for moderate symptoms, and 3 score for severe symptoms (Table 1).

Table 1: Score for measuring the severity of symptoms

Score	Severity	Description
0	No symptoms	No nasal itching, sneezing, runny nose, or loss of smell
1	Mild symptoms	Symptoms are present but easily tolerated and do not interfere with daily activities
2	Moderate symptoms	Symptoms are bothersome and occasionally interfere with daily activities
3	Severe symptoms	Severe Symptoms are very troublesome and significantly interfere with daily activities or sleep

Group M (Medicine) patients received standard medical treatment including antihistamines, decongestants, and corticosteroid nasal spray. These medications were given during the exacerbations of disease and were withheld once the patient became symptom-free. Group S patients (surgery) underwent bilateral inferior turbinoplasty under general anesthesia.

Demographic data of the patient, including age, gender, and duration of symptoms, was recorded on a proforma. Pre-treatment and post-treatment score was also noted down for both groups. Data was computed with the help of the Statistical Package for the Social Sciences version 24. Continuous variables, including duration of symptoms, age, pre-treatment, and post-treatment scores, are presented as mean and standard deviation, whereas qualitative variables, including gender, were given as frequency with percentage. Comparison of two groups was done with respect to continuous variables using an independent t-test; and for pre-treatment and post-treatment scores, the Mann-Whitney U test was applied. A *P*-value of 0.05 or less was considered statistically significant.

Results

Our primary outcome measure was post-treatment reduction of symptoms measured with the help of four parametric symptom score card. The age of the patients selected for this study ranged from 16 to 58 years, with a mean and standard deviation of 36.02±11.09 years. In group M, the mean age of the patients was 34.71±12.31, whereas it was 37.33±9.69 for group S. The difference between the two groups in terms of age was insignificant, with a *P*-value of 0.264 (Table 2).

Out of 90 patients, 62 (68.89%) were male and 28 (31.11%) were female with male to female ration of 2.21:1. In group M, 32 patients were male while 13 were female with male to female ratio of 2.46:1. In group S, 30 patients were male and 15 patients were female with male to female ratio of 2:1. There was in significant difference between groups in terms of gender with *P*-value of 0.649 (Table 2).

Table 2: Comparison of demographic data of two groups

	Group M	Group S
Age in Years (Mean+SD)	34.71±12.31	37.33±9.69
Gender (%)	62 (68.89%)	28 (31.11%)

Table 3: Comparison of duration of symptoms and treatment efficacy

	Group M	Group S	*Test* value	*P*-value
Duration of Symptoms (years)	4.25±1.93	3.84+1.35	0.887	0.378*
Pre-treatment symptom score	8.48±0.92	8.2±0.96	794.50	0.15†
Post-treatment symptoms score	3.22±0.9	3.6±0.65	1186.0	0.123†

** Independent t-test, † Mann Whitney U test*

In group M, the duration of symptoms was 4.15±1.93 years, whereas for group S it was 3.84±1.35 years. An insignificant difference was found between the two groups in terms of duration of symptoms, with a *P*-value of 0.378. In terms of pre-treatment severity of symptoms, both groups had an insignificant difference with a *P*-value of 0.15, as shown in Figure 1 below.

Both groups showed comparable treatment efficacy with a *P*-value of 0.123. In group M, the post-treatment score was 3.22±0.9, and in group S, it was 3.6±0.65. Detailed comparison is shown in Table 3.

Discussion

Allergic rhinitis poses a significant challenge to the healthcare system due to its high prevalence and presents an economic challenge as well. It has a substantial impact on an individual's quality of life and productivity.[12] If left untreated, it may lead to poor quality of life, increased morbidity, and can have a serious impact on the mental health of the individual as well.[13,14] This necessitates timely and efficacious treatment to avoid serious complications.[15]

In our study, we compared the efficacy of surgical treatment, i.e., bilateral inferior turbinoplasty, with standard medical treatment in cases of non-obstructive allergic rhinitis and found that both treatments were equally efficacious, with a *P*-value of 0.123. Hamerschmidt R et al. conducted a similar study in 2015 at the Universidade Federal do Paraná Institute in Brazil and found that inferior turbinoplasty is equally efficacious for both obstructive and non-obstructive allergic rhinitis.[10] Similar results were observed in a study carried out by Jee D et al.[16] In a study, Chhabra N et al. concluded that the inferior turbinate is the initial deposition point for allergen, due to which it undergoes dynamic changes. Hence surgery may alleviate the symptoms even in cases of non-obstructive allergic rhinitis.[17]

In a study conducted in India by Anjali PK et al., it was observed that there was a significant reduction in symptoms of allergic rhinitis, including nasal discharge and obstruction, watery and itchy eyes, sneezing, need to blow the nose, irritability, and lethargy with inferior turbinoplasty.[18]

In a systematic review conducted by Soumya S et al., despite many management options to alleviate symptoms of allergic rhinitis, the literature has yet to determine which treatment option best improves quality of life.[19]

Study conducted by Garcia JP et al. concluded contradictory results to our study. In their study they compared the results of rhinoplasty with and without inferior turbinate reduction in cases of non-obstructive allergic rhinitis. They concluded that inferior turbinate reduction did not result in any improvement in symptoms of non-obstructive allergic rhinitis.[20]

In this study, we could not record the episodes of exacerbation of allergic rhinitis in both groups, nor did we count the days the medication was required by the patients. All this data could help compare the total cost of treatment between the two groups. This could be a possible limitation of this study.

Conclusion

It was demonstrated in our study that surgical treatment, i.e., bilateral inferior turbinoplasty, is equally effective as the conventional non-surgical treatment with antihistamines, decongestants, and corticosteroids in cases of non-obstructive allergic rhinitis.

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Author Contributions

CMBA: Conception, design of the work, and approval for final submission
AH: Writing the original draft, proofreading, and approval for final submission
MW: Revising, editing, supervising for intellectual content, and approval for final submission
SU: Data acquisition, curation, statistical analysis, and approval for final submission
US: Validation of data, interpretation, write-up of results, and approval for final submission
MZK: Manuscript writing for methodology design and investigation, and approval for final submission
CMBA is the nominated guarantor and takes full responsibility for the overall content and integrity of the work