

Efficacy of performing Septoplasty in allergic rhinitis

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Abstract

Introduction: Allergic rhinitis is an allergic reaction that happens when your immune system overreacts to substances that you inhale, such as pollen. The two types of allergic rhinitis are: Seasonal allergic rhinitis (hay fever) Perennial allergic rhinitis, which occurs year-round. Aims and Objectives: To study Efficacy of performing Septoplasty in Allergic Rhinitis. **Methodology :** This was cross sectional study carried out at tertiary health care centre in the patients attended the Otolaryngology Outpatient Department during January 2014 to January 2015, All the patients who were having the symptoms of Allergic Rhinitis like Itchy nose, mouth, eyes, throat, skin, or any area, Runny nose, Sneezing Dark circles under the eyes, Headache, Problems with smell, Stuffy nose (nasal congestion) were included into study while those who were having serious illness like malignancies, immunocopromised diseases and not given consent were exclude from the study. The Statistical analysis is done by Z-test (Difference between two proportions). **Result:** In our study we have Observed that Majority of the Patients were in the Age group of 10-20 i.e. 33.33% followed by 1-10 i.e. 26.66%; 40-50 i.e. 15.55%; 20-30 i.e. 13.33%; 30-40 i.e. 8.88%; and >50 i.e. 2.22%. Majority of the patients were Female 71.11% and 28.88% Males. Before the Operation 84.44% of the patients reported Problem of Itchy nose, mouth, eyes, throat, skin, or any area while only 26.66% patients reported this problem after Operation this observed difference was statistically significant ($Z=5.51$, $p<0.05$) similarly of Runny nose 71.11% and 20.00% ;Significant ($Z=4.8$, $p<0.05$), Sneezing 77.77% and 17.77% ;Significant ($Z=5.69$, $p<0.05$). Dark circles under the eyes in 51.11% and 31.11% this was not statistically significant ($Z=1.92$, $p>0.05$). Headache in 62.22% and 26.66%; significant ($Z=3.39$, $p<0.05$). Problems with smell 53.33% and 28.88%; Significant ($Z=2.35$, $p<0.05$). Stuffy nose (nasal congestion) 64.44% and 15.55%; Significant ($Z=4.49$, $p<0.05$). **Conclusion :** With the Septoplasty operation significantly there was reduction in frequency of the symptoms occurred in allergic rhinitis like Itchy nose, mouth, eyes, throat, skin, or any area, Runny nose, Sneezing, Headache, Problems with smell, Stuffy nose (nasal congestion) except, Dark circles under the eyes which was not significantly reduced.

Keywords: Allergic Rhinitis, Septoplasty, Itchy nose, mouth, eyes, throat, skin, Runny nose, Sneezing, Headache, Problems with smell, Dark circles under the eyes.

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INTRODUCTION

Allergic rhinitis is an allergic reaction that happens when your immune system overreacts to substances that you inhale, such as pollen. The two types of allergic rhinitis

are: Seasonal allergic rhinitis (hay fever) Perennial allergic rhinitis, which occurs year-round. Hay fever is caused by outdoor allergens. Perennial allergic rhinitis is caused by indoor allergens, such as dust mites, pet dander, and mold. Symptoms of allergic rhinitis are similar to cold symptoms. But they are not caused by a virus the way a cold is. When you breathe in an allergen, your immune system springs into action. It releases substances known as IgEs into your nasal passages, along with inflammatory chemicals, such as histamines. Your eyes may itch or your nose and sinuses may become itchy and congested. Scientists are not sure what causes your immune system to overreact to allergens. Allergic rhinitis is common, affecting about 1 in 5 Americans. Seasonal allergic rhinitis is more common in children and

adolescents. Most people with allergic rhinitis have symptoms before age 20. Symptoms stay constant through early adulthood, but begin to improve during middle age and beyond. Symptoms can be mild or severe. Many people who have allergic rhinitis also have asthma. Allergic rhinitis can cause many symptoms, including: Stuffy or runny nose, Sneezing, Post-nasal drip, Red, itchy, watery eyes, Swollen eyelids, Itchy mouth, throat, ears, and face, Sore throat, Dry cough, Headaches, Facial pain or pressure, Partial loss of hearing, smell, and taste, Fatigue, Dark circles under the eyes¹. Allergic rhinitis (AR) is a global health problem that has increased rapidly in prevalence over the past few decades². Rhinitis is broadly defined as inflammation of the nasal mucosa. It is a common disorder that affects up to 40% of the population³. Allergic rhinitis is the most common type of chronic rhinitis, affecting 10 to 20% of the population, and evidence suggests that the prevalence of the disorder is increasing. Severe allergic rhinitis has been associated with significant impairments in quality of life, sleep and work performance⁴. In the past, allergic rhinitis was considered to be a disorder localized to the nose and nasal passages, but current evidence indicates that it may represent a component of systemic airway disease involving the entire respiratory tract. There are a number of physiological, functional and immunological relationships between the upper (nose, nasal cavity, paranasal sinuses, pharynx and larynx) and lower (trachea, bronchial tubes, bronchioles and lungs) respiratory tracts. For example, both tracts contain a ciliated epithelium consisting of goblet cells that secrete mucous, which serves to filter the incoming air and protect structures within the airways. Furthermore, the submucosa of both the upper and lower airways includes a collection of blood vessels, mucous glands, supporting cells, nerves and inflammatory cells. Evidence has shown that allergen provocation of the upper airways not only leads to a local inflammatory response, but also to inflammatory processes in the lower airways, and this is supported by the fact that rhinitis and asthma frequently coexist. Therefore, allergic rhinitis and asthma appear to represent a combined airway inflammatory disease, and this needs to be considered to ensure the optimal assessment and management of patients with allergic rhinitis.^{3,5} Allergic rhinitis (AR) is an inflammatory nasal airway disease in which production of inflammatory mediators and inflammatory cell infiltration are prominent⁶. The clinical manifestations are sneezing, nasal congestion, nasal itching, and rhinorrhea. AR is considered as the commonest allergic disease afflicting more than 50% of atopies in India. It is a common

disorder that affects up to 40% of the population.⁷ The development and validation of the outcomes instrument, named the Nasal Obstruction Symptom Evaluation (NOSE) Scale, was conducted as part of a parallel prospective multicenter observational clinical study. This multicenter study was commissioned and funded by the American Academy of Otolaryngology– Head and Neck Surgery Foundation and coordinated under the auspices of its National Center for the Promotion of Research in Otolaryngology.⁸

MATERIAL AND METHODS

This was cross –sectional study carried out at tertiary health care centre in the patients attended the Otolaryngology Outpatient Department during January 2014 to January 2015, All the patients who were having the symptoms of Allergic Rhinitis like Itchy nose, mouth, eyes, throat, skin, or any area, Runny nose, Sneezing Dark circles under the eyes, Headache, Problems with smell, Stuffy nose (nasal congestion) were included into study while those who were having serious illness like malignancies, immunocopromised diseases and not given consent were exclude from the study. The Statistical analysis is done by Z-test (Difference between two proportions).

RESULT

Table 1: Age wise Distribution of the Patients with Tympanic Membrane Perforation

Age	No.	Percentage (%)
1-10	12	26.66%
10-20	15	33.33%
20-30	6	13.33%
30-40	4	8.88%
40-50	7	15.55%
>50	1	2.22%
Total	45	100%

Majority of the Patients were in the Age group of 10-20 i.e. 33.33% followed by 1-10 i.e. 26.66% ; 40-50 i.e. 15.55%;20-30 i.e. 13.33% ; 30-40 i.e. 8.88%; and >50 i.e. 2.22%.

Table 2: Gender wise Distribution of the Patients with Tympanic Membrane Perforation

Sex	No.	Percentage (%)
Male	13	28.88%
Female	32	71.11%
Total	45	100%

Majority of the patients were Female 71.11% and 28.88% Males.

Table 3: Distribution of the Patients as per the various symptoms before and after Septoplasty Operation reported by Patients

Symptoms Reported by Patients as a Problem of	Before		After		P-value
	(n=45)	(%)	(n=45)	(%)	
Itchy nose, mouth, eyes, throat, skin, or any area	38	84.44%	12	26.66%	Z=5.51, p<0.05. HS
Runny nose	32	71.11%	9	20.00%	Z=4.8, p<0.05. HS
Sneezing	35	77.77%	8	17.77%	Z=5.69, p<0.05. HS
Dark circles under the eyes	23	51.11%	14	31.11%	Z=1.92, p>0.05. NS
Headache	28	62.22%	12	26.66%	Z=3.39, p<0.05. HS
Problems with smell	24	53.33%	13	28.88%	Z=2.35, p<0.05. HS
Stuffy nose (nasal congestion)	29	64.44%	7	15.55%	Z=4.49, p<0.05. HS

HS-Highly Significant, NS-Not Significant.

Before the Operation 84.44% of the patients reported Problem of Itchy nose, mouth, eyes, throat, skin, or any area while only 26.66% patients reported this problem after Operation this observed difference was statistically significant ($Z=5.51$, $p<0.05$) similarly of Runny nose 71.11% and 20.00%; Significant ($Z=4.8$, $p<0.05$), Sneezing 77.77% and 17.77%; Significant ($Z=5.69$, $p<0.05$). Dark circles under the eyes in 51.11% and 31.11% this was not statistically significant ($Z=1.92$, $p>0.05$). Headache in 62.22% and 26.66%; significant ($Z=3.39$, $p<0.05$). Problems with smell 53.33% and 28.88%; Significant ($Z=2.35$, $p<0.05$). Stuffy nose (nasal congestion) 64.44% and 15.55%; Significant ($Z=4.49$, $p<0.05$).

DISCUSSION

When an allergen is inhaled by a person having a sensitized immune system, the allergen triggers the production of the antibody immunoglobulin E (IgE). Studies suggest that there is evidence that eosinophils are implicated in pathophysiology of allergic respiratory diseases. The direct and easy way for allergens and irritants to stimulate the airway is by inhaling it. Thus there is stimulation of mast cells to produce IgE and cytokines which serves as enhancing factors for eosinophilic infiltration in allergic disease¹⁰. Numerous inflammatory cells, including mast cells, CD4-positive T cells, B cells, macrophages, and eosinophils, infiltrate the nasal lining upon exposure to an inciting allergen (most commonly airborne dust, mite fecal particles, cockroach residues, animal dander, moulds, and pollens). The T cells infiltrating the nasal mucosa are predominantly T helper (Th)² in nature and release cytokines (e.g., interleukin [IL]-3, IL-4, IL-5, and IL-13) that promote IgE production by plasma cells. IgE production, in turn, triggers the release of mediators, such as histamine and leukotrienes, that are responsible for arteriolar dilatation, increased vascular permeability, itching, rhinorrhea (runny nose), mucous secretion, and smooth muscle contraction.^{1,2} The mediators and cytokines released during the early phase of an immune response to an inciting allergen trigger a further cellular inflammatory

response over the next 4 to 8 hours (late phase inflammatory response) which results in recurrent symptoms^{3,6}. The basic investigations required in the evaluation of a patient with suspected AR include complete blood picture with peripheral eosinophil percentage, absolute eosinophil count, total IgE levels, nasal smear examination for eosinophils. Eosinophils are a type of white blood cell. The exact role of eosinophils in human body is unclear, but eosinophils are usually associated with allergic diseases and certain infection. A normal eosinophil count is less than 350 cells per microliter of blood. An absolute eosinophil count is a blood test that measures the number of white blood cells called eosinophils. The association between eosinophil and allergic disease has been published in various studies. A correlation between the degree of AR and peripheral blood eosinophilia has been observed in subjects who exhibited a dual response following allergen challenge⁷. Airway inflammation is present in the upper airways, but with little collagen deposition and absence of myofibroblasts in the nasal mucosa⁸. There is evidence of remodeling in the nasal mucosa.⁸ The inflammation in the nasal mucosa is dominated by eosinophils which accumulate in the reticular basement membrane and there is epithelial shedding, though not to the same degree as in the bronchi of patients with allergic asthma.¹⁴ It has also been suggested that neural pathways may contribute to the pathophysiology of allergic rhinitis.¹⁵ Neurotrophins, and nerve-growthfactor (NGF) expressed in the eosinophils in the nasal mucosa has been suggested as candidates for the nasal hyper-responsiveness.¹² Nasal obstruction is mostly the result of dilatation of capillary vessels, whereas bronchial obstruction is mainly caused by smooth muscle contraction. Allergic rhinitis is the most frequent manifestation of allergic disease affecting the airways and its development depends on the interaction between genes, environment and immunological factors. The diagnosis of rhinitis is based on the report of subjective nasal complaints (nasal blockage, itching, sneezing and increased secretions), increased nasal responsiveness and increased nasal airway resistance. To date, the different tests for rhinitis

have low sensitivity and specificity and the diagnosis is therefore predominately made on the basis of clinical history.^{12,13} In our study we have Observed that Majority of the Patients were in the Age group of 10-20 i.e. 33.33% followed by 1-10 i.e. 26.66%; 40-50 i.e. 15.55%; 20-30 i.e. 13.33% ; 30-40 i.e. 8.88%; and >50 i.e. 2.22%. Majority of the patients were Female 71.11% and 28.88% Males. Before the Operation 84.44% of the patients reported Problem of Itchy nose, mouth, eyes, throat, skin, or any area while only 26.66% patients reported this problem after Operation this observed difference was statistically significant ($Z=5.51$, $p<0.05$) similarly of Runny nose 71.11% and 20.00% ;Significant ($Z=4.8$, $p<0.05$), Sneezing 77.77% and 17.77% ;Significant ($Z=5.69$, $p<0.05$). Dark circles under the eyes in 51.11% and 31.11% this was not statistically significant ($Z=1.92$, $p>0.05$). Headache in 62.22% and 26.66%; significant ($Z=3.39$, $p<0.05$). Problems with smell 53.33% and 28.88%; Significant ($Z=2.35$, $p<0.05$). Stuffy nose (nasal congestion) 64.44% and 15.55%; Significant ($Z=4.49$, $p<0.05$). These findings are in confirmation with Dr. Ashkarali T⁹ *et al.*

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