

EFFECTIVENESS OF MEDICAL THERAPY ON NASAL POLYPOSIS: A COMPARATIVE STUDY

Chandni P Engoor¹, Rajasekar M. K²

^{1,2}Department of Otorhinolaryngology, SreeBalaji Medical College & Hospital, Chromepet, Chennai
* rajasekar.k@bharathuniv.ac.in

ABSTRACT

Nasal polyposis seems to be a trivial disease due to easy diagnosis but patient will experience nasal polyposis to be an unpleasant disease, which severely interferes with the quality of life. Nasal polyposis is the most incapacitating illness of the nasal cavity and paranasal sinuses. Various severe symptoms like airway blockage, loss of the senses of smell and taste, anterior and posterior rhinorrhea, sneezing episodes, stuffiness and facial pain associated with this condition testify the serious alteration of the sino-nasal function. The discomfort is often such that daily activities become hampered, forcing the subjects to go on sick leave and to endure a precarious nasal condition. Nasal polyposis occurs as a result of a multifocal edematous degeneration, which originates from an inflammatory mucosal reaction of the paranasal sinuses

Keywords:Nasal polyposis, Diagnostic nasal endoscopy, CTparanasal sinus, Steroid therapy.

Introduction

Nasal polyps (NP) are one of the most common inflammatory mass lesions of the nose, affecting up to 4% of the population. They present with nasal obstruction, nasal discharge, hyposmia, post nasal drip and occasionally facial pain along with headache. Nasal polyposis seems to be a trivial disease due to easy diagnosis by endoscopy and treatment with corticosteroids and surgery in refractory cases. But patient will experience nasal polyposis to be an unpleasant disease, which severely interferes with the quality of life. The scientist will find nasal polyposis to be a challenge because the aetiology, in the large majority of cases, is unknown and because the pathogenesis of polyp formation is poorly understood. While a careful clinical history remains the cornerstone of diagnosis and all patients will undergo a general otorhinolaryngological examination, the emphasis has moved towards diagnostic nasal endoscopy supported by appropriate imaging to confirm the diagnosis, define the extend of pathology and demonstrate relevant anatomy.

Anterior rhinoscopy reveals little information with regard to middle meatal cleft. Those cases in which no gross polyp in nasal cavity create special diagnostic demands on the endoscopist. The small polyp that protrudes between uncinat process and attachment of middle turbinate could not be seen either with naked eye or with microscope and can be detected only when endoscope is introduced as far possible toward the entrance to middle meatus. Nasal endoscopy is inexpensive, easily incorporated into the routine examination and easily repeated for special examinations and monitoring the progress of disease. The plain sinus radiographs may show even a "normal" maxillary, frontal and ethmoid sinus inspite of positive endoscopic findings. Computer assisted tomography helps to delineate the extent of the disease mainly. The objectives of the medical management of nasal polyposis are to eliminate or reduce the volume of polyps, re-establish nasal breathing, diminish symptoms of rhinitis,

reinstate the sense of smell and prevent the recurrence of nasal polyps. The advent of topically administered corticosteroids has improved the treatment of upper (NP and rhinitis) and lower (asthma, chronic obstructive airway disease) airway disease. Corticosteroids form the mainstay of conservative therapy in NP as a primary treatment and to prevent recurrence. In the absence of other warning signs such as pain, bleeding, or unilateral polyps, treatment can be largely conducted in the primary care setting. Corticosteroids have a proven therapeutic effect on the symptoms of nasal polyposis and reduce one of the underlying causes of polyps - inflammation. The efficacy of topical corticosteroids in reducing polyp size and rhinitis symptoms has been demonstrated in several randomized, placebo-controlled trials. They have also been shown to delay the recurrence of polyps after surgery.

MATERIALS AND METHODS

STUDY DESIGN:

This was a prospective randomised controlled study.

STUDY AREA AND STUDY PERIOD:

The present prospective study to compare the effectiveness of medical therapy on the radiographic and endoscopic changes of nasal polyposis was conducted in the department of Otorhinolaryngology of SreeBalaji Medical College and Hospital, Chennai. The study period was from February 2017 to September 2018.

The study population was the patients who presented to outpatient room of department of otorhinolaryngology with complaints of nasal obstruction, nasal discharge, headache, anosmia, allergic symptoms.

METHODOLOGY

A total of 50 patients who had clinical features suggestive of nasal polyposis were selected as study population and were evaluated using a standard proforma

and routine investigative procedures were done for all patients. All patients were treated medically with steroids, leukotriene antagonist, and antihistamines for period of 8 weeks.

Sample Size: 50

Sampling: Simple Random Sampling

Study: Prospective Study

Inclusion criteria:

- Bilateral ethmoidal polyposis(grade1 and 2)
- Nasal polyposis patients aged between 18 yrs – 60 yrs

- Willingness to take oral steroids , topical steroids
- Willingness to give informed written consent

Exclusion criteria :

- Antrochoanal polyposis
- Fungal sinusitis
- Previous nasal polypectomy
- Rhinosporidiosis
- Chronic diseases like diabetes mellitus, systemic hypertension , tuberculosis, Anemia
- Patients on long term steroids for other disorders
- Pregnant / lactating women
- Malignancy
- Cystic fibrosis, Aspirin intolerance, Hurler's disease

Methods of Collection of Data:

1. The cases selected for the study were subjected to detailed history taking and were documented with visual analogue scale.
2. Local examination was done by anterior and posterior rhinoscopy.
3. A routine haemogram (HB,TC, DC) and urine examination (albumin, sugar, microscopy), Absolute Eosinophilic Count(AEC), Random Blood sugar (RBS) were done for the patients.
4. Each patient underwent a systematic diagnostic nasal endoscopy (DNE) and computed tomography of nose

and para nasal sinuses. CT scan was taken within two days of performing diagnostic nasal endoscopy. Thus diagnosis was confirmed.

5. Medical therapy was given for 8 weeks

Protocol for medical management:

All patients under study group will be treated medically with the following:

- Initial phase of 3 weeks
 1. Oral corticosteroid - Deflacortisone – 18 mg/day for 3 weeks

2. Topical corticosteroid - Fluticasone propionate aqueous nasal spray -40mcg -2 puff bd for 3 weeks
 3. Antihistamines - Levocetirizine - 5mg/day for 3 weeks
- Continuation phase of 5 weeks:
 1. Fluticasone propionate aqueous nasal spray -40mcg - 2 puff bd for 5 weeks
 2. Leukotriene antagonists - Montelukast - 10mg /day for 5 weeks
 3. Diagnostic nasal endoscopy and computed tomography was repeated after 8 weeks of medical therapy within 5 days of finishing treatment.
 4. Follow up: All patients were followed up for a period of 6 months

Equipments used:

Nasal endoscope: Karl Storz Hopkins rod optical with cold light source and fibre optic light delivery system. Endoscopes used were with 0 degree, 30 degree angles of view of 4mm diameters along with Karl StorzEndovisionTelecam deluxe camera system with monitor.



Figure 16:Light source and monitor

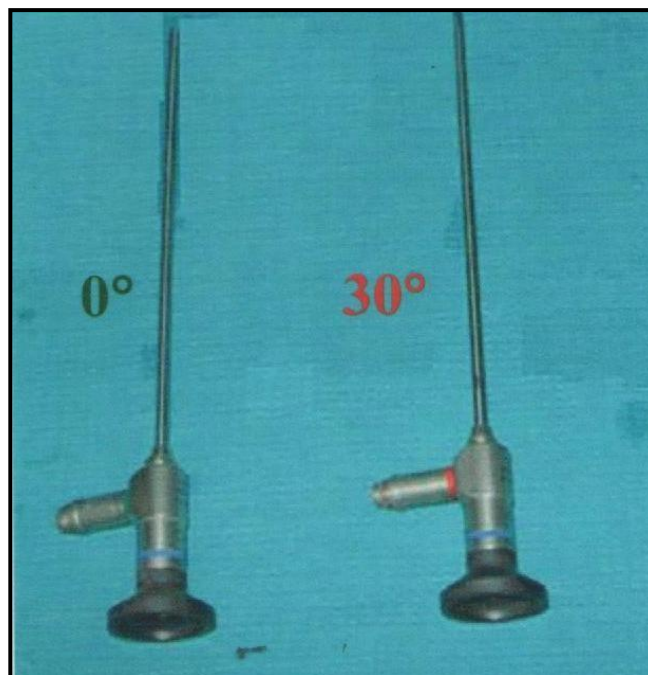


Figure 17: Hopkins Endoscope

Parametres used to assess nasal polyposis: Scoring system to assess symptomatology:

1. The Visual Analogue Scale



	No Problem (Feeling Well)	Severe Problem
NasalObstruction	<input type="range"/>	
Facialpain/pressure	<input type="range"/>	
Sneezing	<input type="range"/>	
Lack of smell		
Anterior/posterior nasal drip	<input type="range"/>	
How do you appreciate your overall health status?	<input type="range"/>	

Figure 18: Visual Analogue scale

In this questionnaire, patients should point on a 10 cm line the degree of health burden condition that is affecting him. The range per question was 0 to 10 points and 0 to 60 points overall.

2. Staging system to assess size of nasal polyposis

Endoscopic grading of nasal polyposis

Nasal endoscopy will be done for all patient included in study group with 0⁰and 30⁰Hopkin's rod endoscope on outpatient basis before and after medical management.

Lund-Kennedy Staging³²

In this endoscopic evaluation, polyps are classified as: 0 - No polyps

- 1 - Polyps in the middle meatus only
- 2 - Polyps expand beyond the middle meatus
- 3 - Polyps reaching lower border of inferior turbinate









Coronal view		Score		
Right Nasal Cavity	Left Nasal Cavity	Right	Left	
		0	0	No polyps
		≤1	≤1	Polyps in the middle meatus, not reaching below the inferior border of the middle turbinate
		≤2	≤2	Polyps reaching below the inferior border of the middle turbinate but not the inferior border of the inferior turbinate
		≤3	≤3	Large polyps reaching to or below the lower border of the inferior turbinate or polyps medial to the middle turbinate
		Sum of scores from both cavities		

Table 1:Lund and Kennedy endoscopic grading of nasal polyp

3. RESULTS

The study was conducted in the department of Otorhinolaryngology of SreeBalaji Medical College and Hospital , Chennai. A total of 50 patients who had clinical features of nasal polyposis were evaluated using a standard proforma and underwent the investigative procedures systematically. Medical therapy was given for 8 weeks. Each patient underwent a systematic diagnostic nasal endoscopy (DNE) and computed tomography (CT) of nose and para nasal sinuses before and after treatment.

Statistical Methods:

Post treatment was considered as primary outcome variable. Pre treatment was considered as primary explanatory variable.

All Quantitative variables were checked for normal distribution within each category of explanatory variable by using visual inspection of histograms and normality Q-Q plots. Shapiro-wilk test was also conducted to assess normal distribution. Shapiro-wilk test p value of > 0.05 was considered as normal distribution. Descriptive analysis: Descriptive analysis was carried out by mean and standard deviation for quantitative variables, frequency and proportion for categorical variables. Data was also represented using appropriate diagrams like bar diagram, pie diagram and box plots. P value < 0.05 was considered statistically significant. IBM SPSS version 22 was used for statistical analysis. (i)Machines IB. IBM SPSS Statistics for Windows, Version 22.0.IBM Corp Armonk, NY; 2013.)

RESULT

A total 50 people were included in the analysis.

Table 3: Descriptive analysis of age group in the study population (N=50)

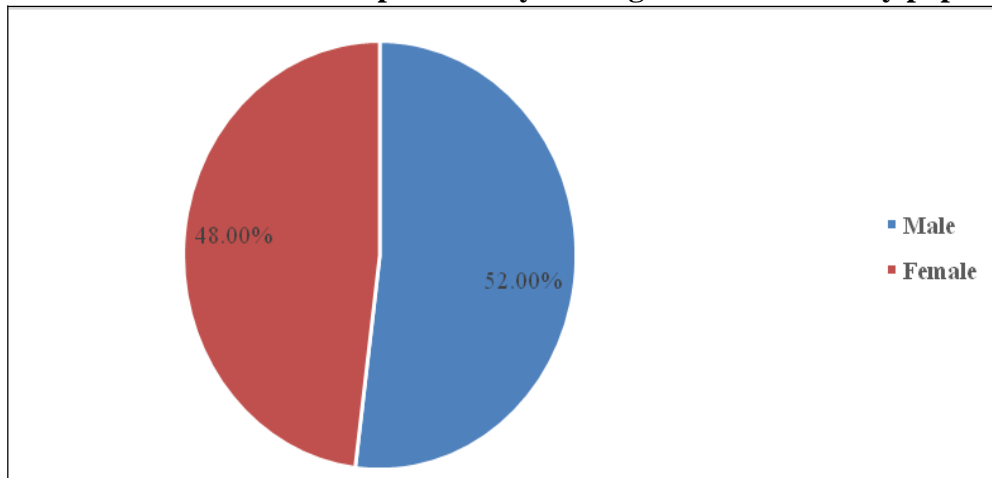
Age group	Frequency	Percentages
13-20	2	4.00%
21-30	10	20.00%
31-40	12	24.00%
41-50	15	30.00%
51-60	11	22.00%

Chart 1: Bar chart of descriptive analysis of age group in the study population (N=50)

Table 4: Descriptive analysis of gender in the study population (N=50)

Gender	Frequency	Percentage
Male	26	52.00%
Female	24	48.00%

Chart 2: Pie chart of descriptive analysis of gender in the study population (N=50)



PRE-TREATMENT OBSERVATIONS

Table 5: Descriptive analysis of pre-treatment symptoms in study population (N=50)

Parameter	Mean \pm SD	Median	Min	Max	95% C.I	
					Lower	Upper
Nasal obstruction	6.72 \pm 0.83	7.00	5.00	8.00	6.48	6.96
Hyposmia	5.86 \pm 0.99	5.50	5.00	8.00	5.58	6.14
Nasal discharge	6.22 \pm 0.86	6.00	5.00	8.00	5.97	6.47
Sneezing	6.06 \pm 0.84	6.00	5.00	8.00	5.82	6.30
Facial pain or headache	5.54 \pm 0.81	5.00	5.00	8.00	5.31	5.77
Total VAS	30.4 \pm 2.84	30.50	25.00	39.00	29.59	31.21

Chart 3: Bar chart of descriptive analysis of pre-treatment symptoms in study population (N=50)

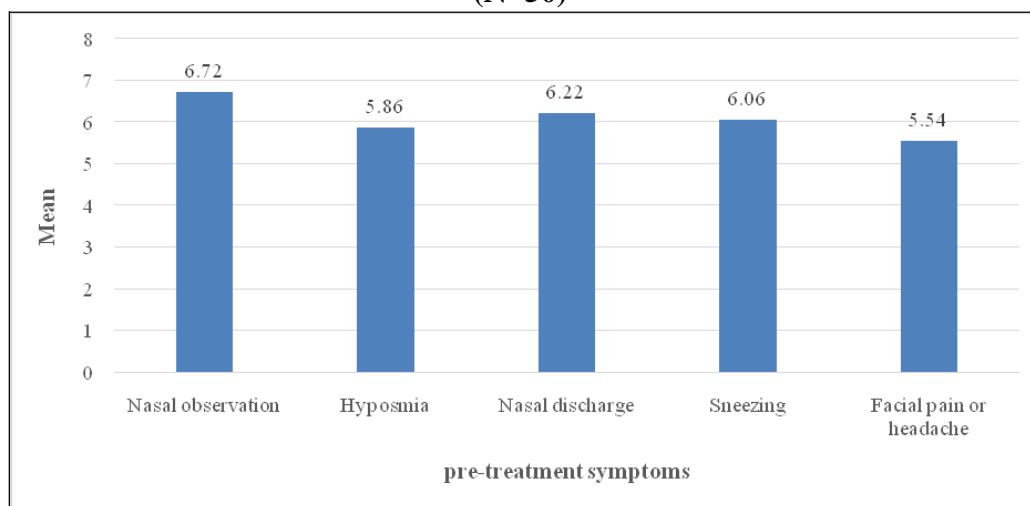


Table 6: Pre-treatment Status of nasal polyposis endoscopic examination (N=50)

Pre-treatment DNE polyp size	Frequency	Percentages
Right		
No polyp	0	0%
Mild polyposis	27	54.00%
Moderate polyposis	23	46.00%
Left		
No polyp	1	2.00%
Mild polyposis	30	60.00%
Moderate polyposis	19	38.00%

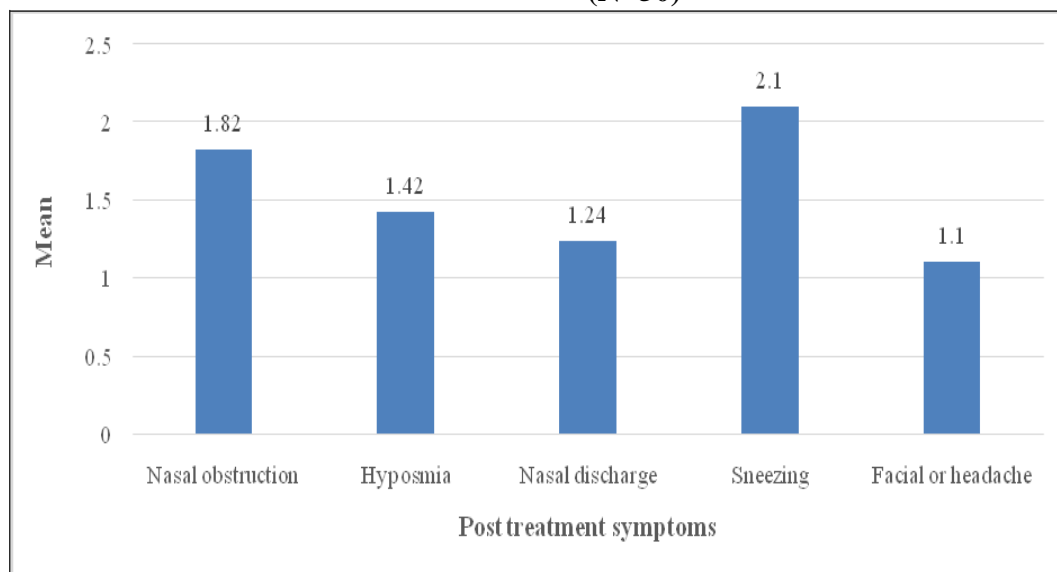
Among the people with polyp on right side, 27 (54%) participants had mild polyposis and 23 (46%) participants had moderate polyposis. Among the people with polyp on left side, 1 (2%) participant had no polyp, 30 (60%) participants had mild polyposis and 19 (38%) participants had moderate polyposis. (Table 6)

POST – TREATMENT OBERVATIONS

Table 11: Descriptive analysis of post treatment symptoms in study population (N=50)

Post treatment symptoms	Mean \pm SD	Median	Min	Max	95% C.I	
					Lower	Upper
Nasal obstruction	1.82 \pm 1.17	2.00	0.00	4.00	1.49	2.15
Hyposmia	1.42 \pm 0.73	1.00	0.00	3.00	1.21	1.63
Nasal discharge	1.24 \pm 0.63	1.00	0.00	3.00	1.06	1.42
Sneezing	2.1 \pm 0.54	2.00	1.00	3.00	1.95	2.25
Facial or headache	1.1 \pm 0.3	1.00	1.00	2.00	1.01	1.19
Total VAS	7.68 \pm 2.62	7.50	2.00	14.00	6.93	8.43

Chart 9: Bar chart of descriptive analysis of post treatment symptoms in study population (N=50)



COMPARISON OF RESULTS

Table 17: Comparison of pre and post treatment symptoms (N=50)

Symptoms	Pre treatment	Post treatment	Wilcoxon signed test P value
Nasal obstruction (Median (IQR))	7(6 to 7)	2 (1 to 3)	<0.001
Hyposmia (Median (IQR))	5 (5.50 to 7)	1 (1 to 2)	<0.001
Nasal discharge(Median (IQR))	6 (6 to 7)	1 (1 to 2)	<0.001
Sneezing (Median (IQR))	6 (5to 7)	2 (2 to 2)	<0.001
Facial pain (Median (IQR))	5 (5to 6)	1 (1 to 1)	<0.001
Total score VAS (Median (IQR))	30.50(28 to 32)	7.50 (6 to 10)	<0.001

Chart 15: Bar chart of comparison of pre and post treatment symptoms (N=50)

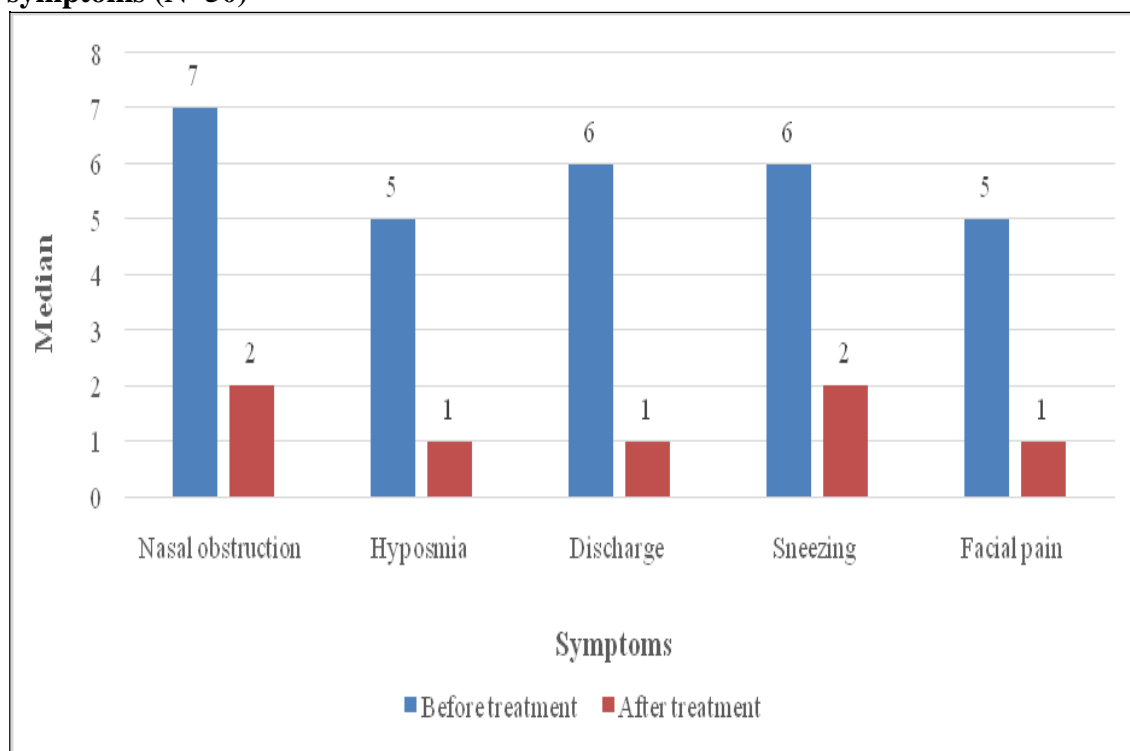


Table 18: Comparison of endoscopic grade of polyp before and after treatment (N=50)

Pre-treatment grade of polyp	Post treatment grade of polyp		
	Grade 0 (No polyp)	Grade 1 (Mild polyposis)	Grade 2 (Moderate polyposis)
Grade 1 (Mild polyposis) (N=26)	25 (96.2%)	1 (3.8%)	0 (0%)
Grade 2 (Moderate polyposis) (N=24)	0 (0%)	6 (25%)	18 (75%)

**No statistical test was applied- due to 0 subjects in the cells.*

Out of 26 patients with grade 1 (mild polyposis) before treatment, 25 (96.2%) patients improved to grade 0 (no polyp) and only 1 (3.8%) patient remained as grade 1 (mild polyposis).

Out of 24 people with grade 2 (moderate polyposis) pre-treatment , 6 (25%) patients improved to grade 1 (mild polyposis) post treatment and another 18 (75%) patients remained as grade 2 (moderate polyposis).

Out of 50 patients, 52% were of grade I nasal polyp and 48% grade II nasal polyp. Grade I polyp showed an improvement of 96.2% in endoscopic findings and 75% in radiological findings. While grade II polyps showed an improvement of 25% in endoscopic findings and 48 % in radiological findings.

DISCUSSION

Medical management using topical and systemic steroids helps to resolve sinonasal polyposis and it also helps to prevent recurrence . So medical management can be used as the treatment of choice for grade 1 nasal polyp and grade 2 polyps to an extent.16 weeks in 298 subjects with moderate NP. They found a significant decrease in nasal congestion, polyp size, and improved quality of life.

ESSENCE OF THE PRESENT STUDY

Our study includes 50 consecutive subjects. From baseline to an end point, they were all examined and followed up by the same otolaryngologist. The characteristics of this study population was close to those usually found in the literature³² in reference to age (median = 42.5 years), sex ratio (1.04)

In the present study results were based on visual analogue scale and three symptoms of nasal polyposis towered above all the others; the nasal obstruction, nasal

discharge, sneezing indices were respectively recorded as 7.00 , 6.00 , 6.00 respectively.The results were similar to the study conducted by Radenne et al⁶⁹. The other clinical disorders (*i.e.*, anterior and posterior rhinorrhea and facial pain) were much less frequent and/or less discomforting.

The various endoscopic and radiological grading systems helps in quantification of nasal polyposis as well as to assess the extent of disease. According to our study, nasal polyposis were quantified based on Lund and Kennedy endoscopic grading and Lund and Mackay CT scan grading into grade 0 (no polyposis), grade 1 (mild polyposis) , grade 2(moderate polyposis), grade 3 (severe polyposis).

In our study a combined treatment consisting of systemic and topical steroid therapy was used. In initial phase of 3 weeks, intranasal steroid spray (fluticasone propionate) was started at a daily dosage of 160 mcg(80 mcg bd) in each nasal cavity in combination with oral corticosteroid (deflacortisone) at a daily dosage of 18mg (6 mg tds) with antihistamine (5mg/day). In continuation phase of 5 weeks intranasal steroid spray was continued at the same dosage along with leukotriene antagonist (10mg/day). The protocol we followed was similar to that done by Nores JM et al⁶.Compliance to prescription was strictly observed. In our study, the severity mean of each symptom was reduced: nasal obstruction (7 to 2), nasal discharge (6 to 1),

sneezing (6 to 2), hyposmia (5 to 1), facial pain (5 to 1) and total VAS (30.5 to 7.5). Similar reduction in polyp size was also observed with endoscopic and radiological findings. According to endoscopic evaluation among the 26 patients with grade 1 polyp, size reduced to grade 0 in 25(96.2%) patients and 1(3.8) patient remained in grade 1. Out of 24 patients with grade 2 polyp, size reduced to grade 1 in 6 (25%) patients.

From this we can conclude that grade 1 nasal polyposis almost resolves with medical management and definitely it would not progress to higher grade. While grade 2 nasal polyp patients can be divided into steroid responders (25%) and steroid non responders (75%).

CONCLUSION

In our study, patients with grade I and grade II nasal polyposis were included and underwent medical treatment for 8 weeks. Endoscopic and Computed tomography findings were compared for each patient before and after treatment. In our study, a high association is found between both the modalities of investigation i.e. CT scan and Diagnostic nasal endoscopy. And it can be used as a method for quantification of nasal polyposis. Based on observations from our study, it can be concluded that medical therapy can be considered as the treatment of choice for grade I nasal polyposis. While grade II nasal polyposis can be divided into steroid responders and steroid non responders. In the overall assessment, following conclusions can be drawn: Majority of patients were in the fourth decade (30%) with male predominance. (52%) The commonest symptoms were nasal obstruction(6.7) and nasal discharge(6.2) along with sneezing(6.0). Most of the patients presented with grade I nasal polyposis (52%) according to endoscopic grading. Anterior ethmoidal sinus was the most frequently diseased sinus in our study followed by posterior ethmoid sinus. According to our observations based on Lund and Kennedy endoscopic grading and Lund and Mackay computed tomography grading, the findings were complementary to each other. According to our observations, Grade 1 and Grade 2 nasal polyps not only reduce in size, none of the Grade 1, 2 nasal polyposis deteriorated to higher grades. From our study, we conclude medical management of mild nasal polyposis can be considered as treatment of choice per se "medical polypectomy,"

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Ethical approval: The study was approved by the Institutional Ethics Committee

CONFLICT OF INTEREST

The authors declare no conflict of interest

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