Section: Miscellaneous

Original Research Article

THE ROLE OF TOPICAL STEROIDS IN NASAL POLYPOSIS AFTER SURGERY

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ABSTRACT

Background: Sinonasal polyposis is a chronic inflammatory condition with a high recurrence rate even after surgical management. Postoperative intranasal corticosteroids are commonly used to reduce inflammation and prevent recurrence; however, short-term outcomes with objective endoscopic assessment are limited. This study aimed to evaluate the effect of postoperative intranasal corticosteroid therapy on clinical symptoms, endoscopic findings, and early recurrence in patients with sinonasal polyposis. **Materials and Methods:** This prospective, single-arm, open-label study included 20 patients with sinonasal polyposis who underwent functional endoscopic sinus surgery. Postoperatively, all patients received intranasal fluticasone propionate along with standard care. Clinical symptoms and diagnostic nasal endoscopy findings were assessed before and after treatment over 3 months. Statistical analysis was performed using Fisher's exact test; $p<0.05$ was considered significant. **Results:** The majority of patients were aged 31–40 years (60%), with male predominance (65%). Allergy was the most common risk factor (55%). All patients presented with nasal obstruction, nasal discharge, and sneezing pre-treatment, which reduced to 10%, 10%, and 15%, respectively, post-treatment. Olfactory dysfunction improved from 25% to 10%, and headache decreased from 80% to 10%. Endoscopic evaluation showed improvement in mucosal status. Recurrence was observed in 1 patient (5%) at 3 months. **Conclusion:** Postoperative intranasal corticosteroid therapy was associated with short-term improvement in clinical and endoscopic outcomes. Larger controlled studies with longer follow-up are required to establish long-term effectiveness.

INTRODUCTION

Sinonasal polyposis affects approximately 1–4% of the population, occurs mainly in middle-aged adults, and shows male predominance.1 Polyps arise from the ethmoidal region, especially the middle meatus. They appear as pale, oedematous, polypoidal masses. Histology shows submucosal oedema with eosinophils, lymphocytes, and plasma cells, which indicates ongoing mucosal inflammation.[2] Chronic mucosal inflammation leads to vascular permeability, impaired mucociliary clearance, ostiomeatal complex obstruction, IgE-mediated immune response, mast cell degranulation are involved, but the mechanism of formation is not fully defined.[3,4] Fluid accumulation within the lamina propria results in mucosal oedema, which contributes to polyp formation.5 Obstruction at the ostiomeatal complex reduces sinus ventilation and drainage.[6] Secretions accumulate and perpetuate chronic mucosal inflammation. This maintains inflammation within the nasal cavity.[7] IgE-mediated reactions and mast cell activation occur in patients with allergy or asthma.[8]

Patients present with nasal obstruction, nasal discharge, and sneezing. These symptoms are present in most cases.[9] Loss of smell occurs when airflow to the olfactory area is reduced. Headache is seen in patients with sinus involvement. Nasal endoscopy shows smooth, pale masses that are insensitive to touch and do not bleed. Computed tomography of paranasal sinuses shows mucosal thickening and sinus opacification. It defines the extent of disease and involvement of the ethmoidal labyrinth.[10] Management includes medical and surgical treatment.[3] Functional endoscopic sinus surgery removes polyps and clears diseased ethmoidal cells.[4] It restores sinus ventilation and drainage through natural ostia. Surgery improves airway patency, but recurrence is common. Recurrent

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disease leads to persistent symptoms and repeat procedures.[7] Recurrence rates vary between patients and depend on inflammatory activity and associated allergy.[8]

Intranasal corticosteroids act on the nasal mucosa and reduce inflammatory cell infiltration.[4,9] Eosinophils and mast cells decrease after treatment. Mucosal oedema reduces and airflow improves. Fluticasone propionate reduces inflammatory mediator production through glucocorticoid receptor–mediated transcriptional regulation.[10] Postoperative use of intranasal steroids maintains mucosal stability after surgery. Regular use reduces residual inflammation in the ethmoidal region. This limits regrowth of polypoidal tissue. Clinical examination and diagnostic nasal endoscopy are used during follow-up to assess symptom relief and detect recurrence early.

Previous studies report use of intranasal steroids in nasal polyposis, but recurrence after surgery is not documented. Many studies rely on symptoms without objective assessment by diagnostic nasal endoscopy. Short-term follow-up within three months is not clearly reported. Local data from tertiary care centres with defined symptom scoring and recurrence assessment are limited. Therefore, this study aimed to evaluate the role of postoperative intranasal corticosteroid spray in improving clinical and endoscopic outcomes and assessing early recurrence in patients with sinonasal polyposis.

MATERIALS AND METHODS

This was a prospective, single-arm, open-label clinical study, conducted in the Department of Otorhinolaryngology at Vinayaka Missions Medical College and Hospital (VMMC&H), Karaikal, after obtaining approval from the Institutional Ethical Committee. Written informed consent was obtained from all participants prior to inclusion in the study.

Inclusion Criteria

Patients with sinonasal polyposis who underwent surgery and were aged above 18 years, both sexes who were willing to use intranasal steroid spray and provided informed written consent were included.

Exclusion Criteria

Patients with significant medical comorbidities such as tuberculosis, hypertension, or diabetes mellitus, presenting with epistaxis or fungal infections, not willing to provide consent, individuals < 18 years of age, and pregnant or lactating women were excluded.

Methods

The study population consisted of 20 patients attending the ENT outpatient department who were diagnosed with sinonasal polyposis and underwent surgical management at our institution. The majority of patients were from Karaikal and surrounding areas of Nagapattinam district. All patients underwent functional endoscopic sinus surgery followed by standard postoperative care, including antibiotics, decongestants, antihistamines, and a short course of systemic steroids. Intranasal corticosteroid spray (fluticasone propionate) was initiated after resolution of immediate postoperative complications. Patients were educated regarding proper spray technique and followed up for a period of three months to assess symptom improvement and recurrence. Recurrence was defined as endoscopic reappearance of polypoidal tissue.

Clinical symptoms such as nasal obstruction, nasal discharge, sneezing, olfactory disturbance, and headache were assessed before and after treatment. Endoscopic evaluation was performed during follow-up to assess mucosal status and detect recurrence of nasal polyps. Endoscopic findings were described descriptively without standardized scoring.

Statistical Analysis

Data were analysed using Fisher's exact test to compare pre- and post-treatment clinical symptoms. A p-value of <0.05 was considered statistically significant. Recurrence rate was reported descriptively as a proportion.

RESULTS

The majority were in the 31–40 years age group (60%), followed by 41–50 years and >50 years (15%), while 20–30 years accounted for 2 patients. Males were predominant (65%) compared to females (35%). Allergy was the most common risk factor (55%), and asthma was present in only 1 patient (5%).

Table 1: Demographic Profile & Risk Factors

Parameter	Category	No. of Patients (%)
Age (years)	20–30	2 (10%)
	31–40	12 (60%)
	41–50	3 (15%)
	>50	3 (15%)
Gender	Male	13 (65%)
	Female	7 (35%)
Past History	Allergy	11 (55%)
	Asthma	1 (5%)
	No history	8 (40%)

All patients (100%) presented with nasal obstruction, nasal discharge, and sneezing pre-treatment. Post-treatment, these symptoms reduced to (10%) for nasal obstruction, (10%) for nasal discharge, and (15%) for sneezing. The number of patients with altered smell decreased from 5 to 2, while headache decreased from (80%) to (10%).

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Table 2: Clinical Symptoms – Pre & Post Treatment

Symptoms	Pre Treatment (n=20)	Post Treatment (n=20)
Nasal obstruction	20 (100%)	2 (10%)
Nasal discharge	20 (100%)	2 (10%)
Sneezing	20 (100%)	3 (15%)
Altered smell	5 (25%)	2 (10%)
Headache	16 (80%)	2 (10%)

Pre-treatment endoscopic findings showed that 14 patients had polyps occupying the entire nasal cavity, 4 polyps involved the middle meatus and turbinat and turbinate, and 2 patients had only polypoidal changes. The third pass was not visualized.

Table 3: DNE Findings – Pre-Treatment

Pass	Findings	No. of Patients
First Pass	Polyp occupying entire nasal cavity	14
Second Pass	Polyp covering entire middle meatus and middle turbinate	4
	Only polypoidal changes seen	2
Third Pass	Not visualized	Not visualized

At 1-month, congested mucosa with discharge was observed in 18 patients, which decreased to 2 patients at 2 months and 4 patients at 3 months.

Table 4: DNE Findings – Post-Treatment Follow-Up

Pass	Findings	1st Month	2nd Month	3rd Month
First Pass	Congested mucosa with discharge present	18	4	Normal
	Discharge / Normal	2	No Discharge	Normal
Second Pass	Middle meatus, middle turbinate, uncinate process	Normal	Normal	Normal
Third Pass	No discharge	No discharge	No discharge	No discharge

Out of 20 patients, 1 patient (5%) showed recurrence, while 19 (95%) had no recurrence at 3 months follow-up. The result was significant with a Z-value of 2.4 and $P < 0.05$.

Table 5: Recurrence Rate After 3 Months

Parameter	Value
Total number of patients	20
Recurrence (No. of cases)	1 (5%)
Z-value	2.4
P-value	<0.05

DISCUSSION

Sinonasal polyposis is a chronic inflammatory condition with a high tendency for recurrence despite surgical management. Postoperative intranasal corticosteroids are commonly used to control inflammation, improve symptoms, and reduce recurrence following endoscopic sinus surgery. In the present study, clinical, endoscopic, and recurrence outcomes were evaluated in patients receiving postoperative intranasal steroid therapy. The study assessed demographic characteristics, associated risk factors, and symptom profiles before and after treatment. The findings provide insight into the effectiveness of intranasal corticosteroid therapy in improving postoperative outcomes and highlight factors affecting disease control.

Our study showed that sinonasal polyposis was more common in middle-aged males, with allergy as the predominant associated risk factor and asthma being less frequent. Patients presented with typical symptoms such as nasal obstruction, nasal discharge, sneezing, olfactory disturbance, and headache, all of which showed improvement following treatment. Similar to our findings Bouatay et al. showed a predominance of middle-aged patients (mean age 41.44 years) with male predominance (52.5%). Allergic rhinitis was a common associated factor (35.3%), and a higher prevalence of asthma (36.4%) was observed.[11] Mawkili et al., reported intranasal corticosteroids improved clinical outcomes, including reductions in symptoms like nasal congestion, discharge, and smell disturbance, which are common presentations in nasal polyposis.[12]

Staricha et al., reported consistent symptom improvements with topical steroids in pre- and post-surgical settings, including relief of nasal obstruction and discharge.[13] An alternative steroid delivery method such as high-dose nasal rinses and novel delivery devices show promise for enhancing symptom control and patient compliance. Sinonasal polyposis appears more prevalent in middle-aged males with allergy as a key risk factor, while intranasal corticosteroid therapy shows consistent symptom improvement, dependent on treatment adherence and methods of drug delivery.

In our study, pre-treatment endoscopy showed major extensive disease, from complete nasal cavity occupation to milder polypoidal changes. On follow-

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up, there was progressive resolution of mucosal congestion and discharge. Normal nasal structures were gradually restored over time. Similarly, the study by Udeesh et al. reported predominantly moderate to severe disease preoperatively (Grade II 45% and Grade III 35%) and postoperative endoscopic improvement with healthy mucosa in 70% and residual polypoidal changes in 11.7%.[14] Suligavi et al. reported significant postoperative endoscopic improvement, with Lund–Kennedy scores decreasing from 6.33 at 1 week to 2.36 in the saline group and from 5.5 to 1.18 in the steroid group at 12 weeks.[15] Thanneru et al. reported severe preoperative disease with a mean Lund–Kennedy score of 7.4, which significantly reduced to 2.2 following steroid therapy, along with symptomatic improvement by decrease in SNOT-22 score from 52.2 preoperatively to 15.8 postoperatively.[16] These findings are comparable to our study as both showed extensive preoperative disease and consistent postoperative endoscopic improvement following steroid therapy.

In our study, low recurrence rate was observed during follow-up, indicating a positive clinical outcome with postoperative intranasal steroid therapy. This is lower than reported by Udeesh et al., reported the recurrence rate of 18.3%, whose findings similarly support the role of intranasal corticosteroids in reducing postoperative recurrence.[14] Similar to these Ji et al., reported a recurrence rate of 6.5% at 6 months, indicating a low early postoperative recurrence with intranasal corticosteroid therapy. But their study showed a progressive increase in recurrence to 31.6% over longer follow-up periods.[17] Bouatay et al. reported a recurrence rate of 20.7%. The higher recurrence in their study may be due to longer follow-up duration and poor compliance with postoperative intranasal corticosteroid therapy, identified as a key contributing factor.[11] These findings indicate that postoperative intranasal corticosteroid therapy is associated with low recurrence rate observed. However, long-term disease control appears to depend on continued adherence and duration of follow-up, as recurrence may increase over time.

These findings demonstrate that postoperative intranasal corticosteroid therapy was associated with symptom improvement. Disease control appears more favourable in patients with good treatment adherence, while recurrence may increase with longer follow-up, highlighting the importance of sustained therapy and regular monitoring.

Limitations

This study has limitations, including a small sample size and short follow-up period, which may not reflect long-term recurrence. The open-label design without a control group may also introduce bias. Future studies with larger populations, longer follow-up, and better assessment of compliance and treatment methods are needed for more reliable outcomes.

CONCLUSION

Postoperative intranasal corticosteroid therapy was associated with significant clinical and endoscopic improvement in sinonasal polyposis. A low recurrence rate was observed at 3 months; however, definitive conclusions on recurrence prevention cannot be established due to study limitations. Further controlled studies are required.

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