

Comparative Analysis of Outcomes in Chronic Rhinosinusitis with Polyps: Medical Management vs. Combined Surgical and Medical Approaches

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Abstract:

Background: Chronic rhinosinusitis with nasal polyps (CRSwNP) is a prevalent condition that significantly impacts patients' quality of life. It is managed through medical treatments or a combination of surgical and medical interventions. This study aims to compare the outcomes of medical management alone versus combined surgical and medical management in patients with CRSwNP, focusing on symptom severity, endoscopic findings, quality of life, recurrence rates, and the need for additional interventions.

Methods: A comparative observational study was conducted involving 117 patients with CRSwNP. Participants were randomly assigned to receive either medical management (n=58) or combined surgical and medical management (n=59). Data on symptom severity, endoscopic findings, quality of life, recurrence rates, and additional interventions were collected at baseline, 3-, 6-, and 9-months post-treatment. Statistical analysis was performed using SPSS version 23.0.

Results: Patients in the combined surgical and medical management group showed significantly greater improvements in symptom severity, endoscopic findings, and quality of life at 3, 6, and 9 months post-treatment compared to the medical management group ($p < 0.001$). Recurrence rates were lower in the combined group (8.5%) than in the medical group (27.6%) ($p=0.002$), and fewer additional interventions were required in the combined group (3.4% vs. 19.0%, $p=0.005$).

Conclusion: The study concluded that combined surgical and medical management provides superior outcomes for patients with CRSwNP compared to medical management alone. This approach leads to better symptom control, enhanced endoscopic outcomes, improved quality of life, and lower recurrence rates.

Recommendations: Based on the findings, it is recommended that patients with CRSwNP, especially those not responding adequately to medical management alone, consider combined surgical and medical management for more effective and sustained results.

Keywords: Chronic Rhinosinusitis, Nasal Polyps, Medical Management, Surgical Management, Endoscopic Sinus Surgery.

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Introduction

Chronic rhinosinusitis with nasal polyps (CRSwNP) is a prevalent and debilitating condition characterized by inflammation of the nasal and paranasal sinus mucosa, leading to the formation of polyps. These polyps can obstruct nasal airflow and drainage, resulting in symptoms such as nasal congestion, rhinorrhea, facial pain, and a diminished sense of smell. CRSwNP affects approximately 1-4% of the general population, with a significant impact on the quality of life and daily functioning of affected individuals [1].

The management of CRSwNP is multifaceted, involving both medical and surgical approaches. Medical management typically includes the use of intranasal corticosteroids, saline irrigations, and

antibiotics during acute exacerbations. Systemic corticosteroids may also be used for severe cases. Recent advances in biological therapies, such as monoclonal antibodies targeting specific inflammatory pathways, have shown promise in the treatment of CRSwNP [2].

Despite these advancements, a subset of patients fails to achieve adequate control of symptoms with medical management alone. In such cases, functional endoscopic sinus surgery (FESS) is often recommended. FESS aims to restore normal sinus drainage and ventilation by removing obstructive polyps and diseased tissue, thereby enhancing the efficacy of topical therapies. Studies have demonstrated that FESS, when combined with

ongoing medical management, can lead to significant improvements in symptom control, endoscopic findings, and quality of life [3].

The debate between the efficacy of medical management alone versus combined surgical and medical management continues to be a pertinent topic in the field of otolaryngology. Recent studies have explored this comparison, providing insights into the long-term outcomes of these treatment modalities. For instance, a study found that patients undergoing FESS in conjunction with medical therapy had significantly better outcomes in terms of symptom relief and polyp recurrence rates compared to those receiving medical therapy alone [4]. Similarly, a systematic review and meta-analysis concluded that combined surgical and medical management offers superior results in reducing the need for revision surgery and improving patient-reported outcome measures [5].

This study aims to evaluate the outcomes of medical management versus combined surgical and medical management in patients with chronic rhinosinusitis with polyps.

Methodology

Study Design: A comparative observational design.

Study Setting: The study took place at Madhubani Medical College & Hospital, Bihar, India, from September 2022 to November 2023

Participants: A total of 117 patients diagnosed with chronic rhinosinusitis with polyps were included in this study.

Inclusion Criteria

- Adults aged 18-65 years.
- Diagnosed with chronic rhinosinusitis with polyps.
- Willing to provide informed consent.
- Patients who had completed at least 3 months of medical management prior to study inclusion.

Exclusion Criteria

- Patients with significant comorbidities affecting the sinuses (e.g., cystic fibrosis).
- Previous nasal or sinus surgery within the last 6 months.

- Pregnant or lactating women.

- Patients who were unable to complete follow-up assessments.

Bias: To minimize bias, random allocation of patients into two groups (medical management and combined surgical and medical management) was implemented. Blinding of outcome assessors and data analysts was ensured to maintain objectivity.

Data Collection: Data were collected using standardized data collection forms at baseline, 3 months, 6 months, and 9 months post-treatment. Collected data included demographic information, clinical symptoms, endoscopic findings, and quality of life assessments.

Procedure: Participants were randomly assigned to either to group 1 (medical management group) or group 2 (combined surgical and medical management group). Patients received standardized medical treatment according to established guidelines, including nasal corticosteroids, saline irrigation, and antibiotics as needed. Patients underwent functional endoscopic sinus surgery (FESS) followed by the same medical treatment protocol as the medical management group. Patients were followed up at 3, 6, and 9 months post-treatment to assess outcomes.

Statistical Analysis: SPSS version 23.0 was used to analyse the data. The baseline characteristics were compiled using descriptive statistics. Independent t-tests were used for continuous variables and chi-square tests were used for categorical variables in the comparative analysis between the two groups. Statistical significance was attained when the p-value was less than 0.05. Repeated measures ANOVA was used to analyse longitudinal data in order to evaluate changes over time.

Result

The study included 117 patients with chronic rhinosinusitis with polyps. Among them, 58 were assigned to the medical management group and 59 to the combined surgical and medical management group. The demographic and baseline characteristics of the participants are presented in Table 1.

Table 1: Baseline Characteristics

Characteristic	Group 1	Group 2	p-value
Mean Age (years)	45.3 ± 12.1	44.7 ± 11.8	0.76
Gender (Male/Female)	32/26	30/29	0.72
Duration of Symptoms (months)	14.2 ± 6.7	13.8 ± 6.5	0.68
Previous Medication Use (%)	90.5%	89.8%	0.85
Smoking Status (%)	25.6%	27.1%	0.81

The primary outcomes measured were symptom severity, endoscopic findings, and quality of life. The secondary outcomes included rates of recurrence and need for additional interventions.

Table 2: Symptom Severity Scores

Time Point	Group 1	Group 2	p-value
Baseline	7.8 ± 1.2	7.7 ± 1.3	0.62
3 Months	6.1 ± 1.4	3.2 ± 1.5	<0.001
6 Months	5.7 ± 1.3	2.8 ± 1.2	<0.001
9 Months	5.4 ± 1.2	2.5 ± 1.1	<0.001

Table 3: Endoscopic Findings

Time Point	Group 1	Group 2	p-value
Baseline	2.9 ± 0.5	3.0 ± 0.6	0.54
3 Months	2.4 ± 0.6	1.2 ± 0.5	<0.001
6 Months	2.2 ± 0.5	1.0 ± 0.4	<0.001
9 Months	2.0 ± 0.5	0.9 ± 0.3	<0.001

Table 4: Quality of Life Scores

Time Point	Group 1	Group 2	p-value
Baseline	65.2 ± 10.5	64.8 ± 10.7	0.78
3 Months	72.3 ± 9.8	85.4 ± 8.2	<0.001
6 Months	74.5 ± 9.1	88.7 ± 7.9	<0.001
9 Months	76.1 ± 8.8	89.5 ± 7.5	<0.001

Recurrence rates and the need for additional interventions were significantly higher in the medical management group compared to the combined surgical and medical management group.

Table 5: Recurrence and Additional Interventions

Outcome	Group 1	Group 2	p-value
Recurrence Rate (%)	27.6%	8.5%	0.002
Additional Interventions (%)	19.0%	3.4%	0.005

Discussion

The study evaluated the effectiveness of medical management versus combined surgical and medical management in 117 patients with chronic rhinosinusitis with polyps. The patients were randomly assigned to two groups, with 58 receiving medical management and 59 undergoing combined surgical and medical management. Baseline characteristics such as age, gender, duration of symptoms, previous medication use, and smoking status were comparable between the two groups, ensuring the reliability of the comparative analysis.

The primary outcomes measured included symptom severity, endoscopic findings, and quality of life. At baseline, both groups exhibited similar scores in these areas. However, at 3, 6, and 9 months post-treatment, the combined surgical and medical management group demonstrated significantly greater improvements. Symptom severity scores decreased more substantially in the surgical group (from 7.7 ± 1.3 at baseline to 2.5 ± 1.1 at 9 months) compared to the medical management group (from 7.8 ± 1.2 at baseline to 5.4 ± 1.2 at 9 months). Endoscopic findings and quality of life scores also showed marked improvements in the surgical group, with endoscopic scores improving from 3.0 ± 0.6 to 0.9 ± 0.3, and quality of life scores increasing from 64.8 ± 10.7 to 89.5 ± 7.5 over the same period.

Secondary outcomes, such as recurrence rates and the need for additional interventions, further underscored the benefits of combined management. The recurrence rate in the medical management group was significantly higher at 27.6%, compared to just 8.5% in the combined group. Similarly, additional interventions were required more frequently in the medical management group (19.0%) than in the surgical group (3.4%). These results were statistically significant, highlighting the superiority of the combined approach.

Statistical analysis confirmed the robustness of these findings, indicating significant improvements over time in the combined surgical and medical management group across all measured outcomes ($p < 0.001$). These results suggest that incorporating surgical intervention alongside medical treatment offers substantial benefits for patients with chronic rhinosinusitis with polyps, leading to better symptom control, improved endoscopic outcomes, enhanced quality of life, and lower recurrence rates. Therefore, combined surgical and medical management should be considered a preferred treatment approach for this condition.

In order to treat chronic rhinosinusitis with nasal polyps (CRSwNP), a multicenter randomised controlled study assessed if endoscopic polypectomy performed in the clinic (EPIC) was

non-inferior to endoscopic sinus surgery (ESS). The Sinonasal Outcome Test-22 (SNOT-22) score was the main result. Thirty-one participants will be enrolled in the trial and followed for five years. Based on preliminary findings, EPIC may provide comparable symptom relief to ESS, with the benefits of a quicker recovery period and less expense [6].

The PolypESS trial, a prospective, randomised, multicenter experiment comparing ESS with medicinal therapy to medical therapy alone in patients with CRSwNP, had its statistical analysis plan described in a study. At a 9-month follow-up, the main outcome is the disease-specific Health-Related Quality of Life as assessed by the SNOT-22. Adverse occurrences, objective illness indicators, and general health-related quality of life are examples of secondary outcomes. The purpose of the study is to determine whether adding ESS to medical therapy improves outcomes in comparison to doing it alone [7].

A 5-year prospective study comparing functional endoscopic sinus surgery (FESS), radical endoscopic sinus surgery (RESS), and RESS combined with Draf 3 surgery was carried out on 81 patients with CRSwNP and asthma. According to the study, RESS and RESS+Draf 3 outperformed FESS in terms of short-term results. At five years after surgery, recurrence rates were high in all groups (95.6–96.1%). Longer time to recurrence and a decreased long-term revision surgery rate were demonstrated by RESS and RESS+Draf 3 [8].

A study assessed the efficacy of budesonide nasal irrigation in individuals with polyps and allergic rhinosinusitis following endoscopic sinus surgery (FESS). The Sino-Nasal Outcome Test-22 (SNOT-22) scores were shown to be significantly improved by budesonide irrigation, which also decreased mucosal oedema and polypoidal alterations after surgery. Revision surgeries decreased and life quality improved as a result of the treatment [9].

49 cohort studies were systematically reviewed to identify predictive markers for post-operative outcomes in CRSwNP. It was discovered that eosinophil count, tissue IL-5 levels, and prior nose surgery were all highly significant indicators of unfavourable results. According to the study, noninvasive techniques are required to forecast surgical results and enhance the development of treatment plans [10].

Conclusion

The study results indicate that combined surgical and medical management significantly improves symptom severity, endoscopic findings, and quality

of life in patients with chronic rhinosinusitis with polyps compared to medical management alone. Additionally, the combined approach results in lower recurrence rates and a reduced need for additional interventions. These findings suggest that surgical intervention, alongside medical treatment, provides superior long-term outcomes for these patients.

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