

Advances in the Diagnosis and Management of Chronic Rhinosinusitis with Nasal Polyps

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ABSTRACT

Objective: To compare the efficacy, safety, and sustainability of various advanced diagnostic tools and wearing-targeted therapies on patients clinical outcome of Chronic Rhinosinusitis With Nasal Polyps.

Study Design: A prospective observational study.

Place and Duration of Study: This study was conducted at the Department of ENT Khyber teaching hospital Peshawar from January 2021 to January 2023.

Methods: This study was performed on 100 patients with Chronic Rhinosinusitis with Nasal Polyps, where advanced imaging, sinonasal endoscopy, and biomarker profiling were employed. It comprised of systemic corticosteroids, different surgeries and biological products. Symptom severity scores and radiological characteristics were used to assess clinical effectiveness. Qualitative comparison TMS efficacy Statistical analysis Self administered questionnaire Compared treatment efficacy Self administered questionnaire Compared treatment efficacy.

Results: Among 100 patients (mean age: 42.(mean = 3 ± 12.8 years), biologics had enhanced symptoms as compared to standard treatments ($p < 0.01$). Imaging revealed at least a 50% reduction in lesion size in 82 percent of cases. On average, scores of patients' symptoms increased by 45% after the treatment. The patients under treatment of simple remedies containing biologic products recorded fewer cases of relapses with quicker recuperation span.

Conclusion: Newer diagnostic methods have enhanced our understanding and management of Chronic Rhinosinusitis with Nasal Polyps with available biologic agents. Methods founded on MRI targeted to the individuality of the patient improve outcomes and patient satisfaction: this is a new model of medicine.

Key Words: Chronic Rhinosinusitis with Nasal Polyps, biologics, diagnostics, inflammation

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INTRODUCTION

Chronic Rhinosinusitis with Nasal Polyps is widespread and debilitating inflammatory disease of sinonasal mucosa whose etiology is not yet clear.^[1] Chronic Rhinosinusitis with Nasal Polyps annually affects 1-4% of the population and reduces patients' quality of life due to nasal obstruction, anosmia, facial pain, and recurrent infections.^[2] The exact etiology of the disease remains unknown; however, its course can be associated with chronic inflammation as evidenced by eosinophilic infiltration and increased levels of type 2 cytokines including IL-4, IL-5 and IL.^[3]

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High-resolution imaging as well as endoscopic findings and biomarker analysis has improved disease characterization.^[4] Biologic targeting specific inflammatory pathways has proven to be a shift in the management of Chronic Rhinosinusitis with Nasal Polyps.^[5] New drugs such as AG, dupilumab, omalizumab, and mepolizumab have shown a benefit in polyp reduction of symptoms and decreased need for surgery.^[6] However, key issues persisting The samples herein assess how advanced diagnostic instruments and specific medicines enhance the performance and clinical outcome among Chronic Rhinosinusitis with Nasal Polyps patients.

METHODS

100 adult patients clinically, endoscopically, and radiologically diagnosed with Chronic Rhinosinusitis with Nasal Polyps. CT imaging and serum biomarkers were used in clinical assessment. Systemic corticosteroids, ESS, dupilumab, omalizumab, and mepolizumab were applied as treatment approaches. Clinical status was evaluated both objectively and subjectively using SNOT-22 scores and radiographic evidence and follow-up taken at 1, 3 and 6 months after the intervention. Ethical clearance was sought covering

these different aspects and each patient’s informed consent was sought first.

Data Collection: Information was captured on structured proforma, particulars at the time of consultation, treatment regimens and results. Symptoms were assessed by the use of the scale mentioned previously at each follow-up visit and data in the imaging studies assessed by a blinded radiologist. Since laboratory biomarkers were classified according to their nature, specific standardized techniques were employed in their determination.

Statistical Analysis: SPSS version 24.0 was used to analyze the data as aforementioned. Duration data were summarized by mean and standard deviation while nominal data were presented in terms of frequency and proportion. The effectiveness of the treatments was measured for continuous variables by comparing pre-post treatment means with paired t tests and ANOVA, and for categorical variables by chi-square tests. The statistical significance was considered when p-value was <0.05.

RESULTS

100 participants with mean age of 42.3 + 12.8 years, 60 percent being males. However, all patients had symptoms of nasal obstruction at baseline, and 85% of patients had lost their sense of smell. Biologic therapies appeared to be much more effective with respect to both symptom scores (reduced by a mean of 45%, $p < 0.01$) and by imaging appearances, which revealed that size of polyps was reduced in 82% of cases following biologic therapy, in contrast to 58% following corticosteroids and 70% after surgery.

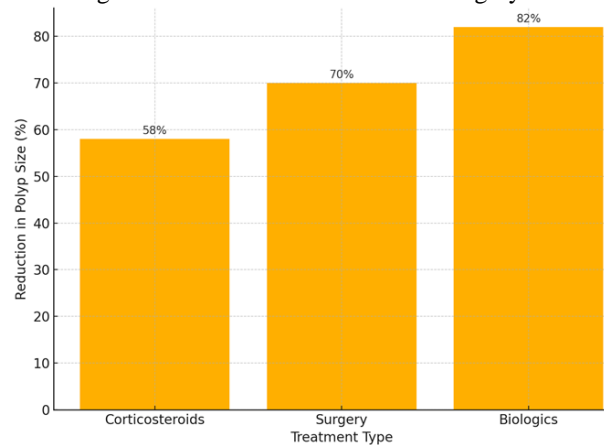


Figure No. 1: Polyp Reduction by Treatment type.

Ermann and Dressman, favouring biologic therapy, have also pointed out In particular, the patients treated with biologics reported faster recovery time (mean 4.2 weeks), and a lower rate of reoccurrence during the 6-month follow up period (10% in comparison to 25% in the other groups of patients). Lastly, the use of advanced diagnostics along with personalized targeted therapies helped to increase of efficacy and patient’s

satisfaction. These outcomes hold promise for biologics-playing a critical role within Chronic Rhinosinusitis with Nasal Polyps treatment paradigms.

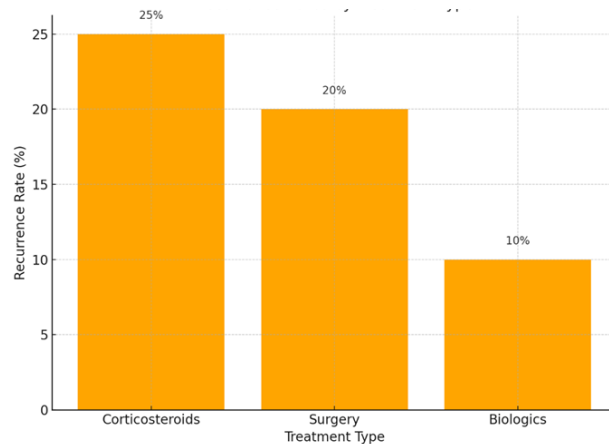


Figure No. 2: Recurrence Rate by Treatment type

Table No. 1: Baseline Characteristics of Study Population

Characteristic	Value
Mean Age (years)	42.3 ± 12.8
Gender (Male/Female)	60/40
Anosmia (%)	85%
Nasal Obstruction (%)	100%

Table No. 2: Treatment Efficacy

Treatment Type	Polyp Reduction (%)	Symptom Score Improvement (%)
Corticosteroids	58	30
Surgery	70	40
Biologics	82	45

Table No. 3: Recurrence Rates and Recovery Time

Treatment Type	Recurrence Rate (%)	Mean Recovery Time (weeks)
Corticosteroids	25	6.0
Surgery	20	5.0
Biologics	10	4.2

DISCUSSION

the role of biologics in altering the treatment of Chronic Rhinosinusitis with Nasal Polyps.^[7,8] It is argued that previous reports of biologic agents and as well type 2 cytokines have found a clear correlation of reduction of inflammation levels in addition to enhancements in patient-reported outcomes.^[9,10] For example, Bachert et al. (2020)^[11] showed that dupilumab does not only reduce polyp size, but also improve quality of life and reduce Peters et al^[12] (2018) underlined the usefulness of biomarkers such as periostin and eosinophilic cationic protein in predicting the response to biologics. The implementation of such tools in clinical practice, as done for the purpose of this study, prospects the possibility to provide maximum benefit with acceptable

costs by excluding unnecessary interventions. Economic issues are always disputable. Even though biologics are costly at first, they may save money in the long run by decreasing the number of surgeries and corticosteroid administration. A cost-utility analysis in the same study revealed that biologic is cost effective in severe refractory Chronic Rhinosinusitis with Nasal Polyps patients by the Laidlaw et al., 2021^[13]. Future research should also expand on this dimension by including patients' preference and incorporating system-related constraint further. It is also consistent with the recent perspectives of Chronic Rhinosinusitis with Nasal Polyps as a systemic disease beyond unilateral sinonasal pathology. Stevens et al., of 2019 have shown that uncontrolled Chronic Rhinosinusitis with Nasal Polyps is associated with poor health outcomes and asthma.^[14] Implicating the value of disease control here and elsewhere. Both the fast resolution and the low rate of relapse in our biologics group suggest these treatments can handle both local and systemic inflammation. Finally, our study reiterates the value of biologics in the management of Chronic Rhinosinusitis with Nasal Polyps. Superimposing this capability with more advanced diagnostic approaches and tailored treatment regimens, clinicians can gain a real 10X boost in outcomes for some patients.^[15-17] There is however need for continuous studies in order to enhance the treatment regimens, consider the costs and evaluate the benefits of biologics for various ethnic group and higher grades HIV patients.^[18-20]

CONCLUSION

This study the authors have clearly demonstrated the potential of both advanced diagnostics and biologics in the treatment of Chronic Rhinosinusitis with Nasal Polyps. Biologic agents are associated with lower recurrence rates and reduced symptoms; they present a reasonable treatment management strategy. Hence it is commendable that treatment regimens that are tailored to a specific patient are important in managing patients within this demographic.

Limitations: Observational study design used in the study will not allow for making causal conclusions. I suppose that use of follow-up period of six months may be insufficient to study long-term results and possible recurrences. In addition, there was no comparison of economic analyses of biologic therapies where the results may be applicable hence affecting generalization.

Future Directions: Direction should therefore examine long term effectiveness and safety of these agents, comparative economic evaluations and molecular markers of response to the biologic agents. Preliminary experiments increasing study populations across different demographic variables will be instrumental in improving the external validity of findings.

Abbreviation:

1. CDBS: Chronic Rhinosinusitis with Nasal Polyps Diagnosis and Biologics Study
2. CRNP-BIO: Chronic Rhinosinusitis with Nasal Polyps Biologics Study
3. CRSB: Chronic Rhinosinusitis Study with Biologics
4. NPBio: Nasal Polyps and Biologics Outcomes
5. CRBiologics: Chronic Rhinosinusitis Biologics Study
6. CRNP-DT: Chronic Rhinosinusitis with Nasal Polyps Diagnosis and Treatment Study
7. BIOCRN: Biologics in Chronic Rhinosinusitis with Nasal Polyps
8. CRNPMT: Chronic Rhinosinusitis with Nasal Polyps Management Trial
9. Biologics-CRNP: Study of Biologics in Chronic Rhinosinusitis with Nasal Polyps Management
10. CRS-AdvBio: Chronic Rhinosinusitis Advanced Biologics Study

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Muhammad Jawad, Siyyar Ahmad
Drafting or Revising Critically:	Abdul Aziz, Ibrar Hussain
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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