Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/ynmn0876

HOSPITAL IN-PATIENT INCIDENCE OF CHRONIC RHINOSINUSITIS AND CLINICAL OUTCOME FOLLOWING FUNCTIONAL ENDOSCOPIC SINUS SURGERY

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Abstract
Chronic rhinosinusitis (CRS) is a prevalent inflammatory condition of the nose and paranasal sinuses persisting beyond 12 weeks. Functional Endoscopic Sinus Surgery (FESS), in conjunction with meticulous postoperative care, has emerged as a cornerstone of its management. This study evaluates the in-patient incidence of CRS and allergic fungal rhinosinusitis (AFRS) over a 5-year period and assesses clinical and functional outcomes following FESS. It also explores the role of disease-specific outcome measures in assessing response to treatment.

Introduction
Chronic Rhinosinusitis (CRS) is characterized by persistent inflammation of the nose and paranasal sinuses lasting more than 12 weeks. Two major subtypes exist: CRS with nasal polyps (CRSwNP) and CRS without nasal polyps (CRSsNP). A specific variant, Allergic Fungal Rhinosinusitis (AFRS), represents an immunological response to fungal antigens.
The cornerstone of CRS/AFRS management includes medical therapy and, when indicated, surgical intervention via Functional Endoscopic Sinus Surgery (FESS). This study quantifies subjective and objective improvement in CRS/AFRS patients undergoing FESS, with an emphasis on in-patient incidence, symptom progression, recurrence profiles, and functional outcomes.

Aims and Objectives
Primary Objectives
1. To determine the in-patient incidence of CRS and AFRS over a consecutive five-year period (Feb 2015 – July 2019).
2. To assess clinical outcomes of FESS through standardized follow-up.
3. To evaluate functional outcomes postoperatively in patients undergoing FESS.

Secondary Objective
- To identify and characterize the recurrence profile of CRS/AFRS following surgical and medical treatment.

Materials and Methods

Study Design
- **Mixed prospective and retrospective observational study**.
- Patients were evaluated from hospital records (retrospective arm) and newly recruited cases (prospective arm).
- Inclusion: Patients diagnosed with CRS or AFRS requiring FESS.
- Exclusion: Malignancy, systemic immunodeficiency, or incomplete data.

Parameters Studied
- Demographic profile
- Symptomatology
- Radiological (CT) findings
- Histopathology
- SNOT-22 (Sinonasal Outcome Test)
- Lund-Mackay CT score
- Philpott-Javer staging
- Serum total IgE levels
- Fungal cultures and isolates

Surgical Technique
- Standardized Functional Endoscopic Sinus Surgery under general anesthesia.
- Postoperative care included debridement, saline irrigation, topical and systemic corticosteroids, and antihistamines.

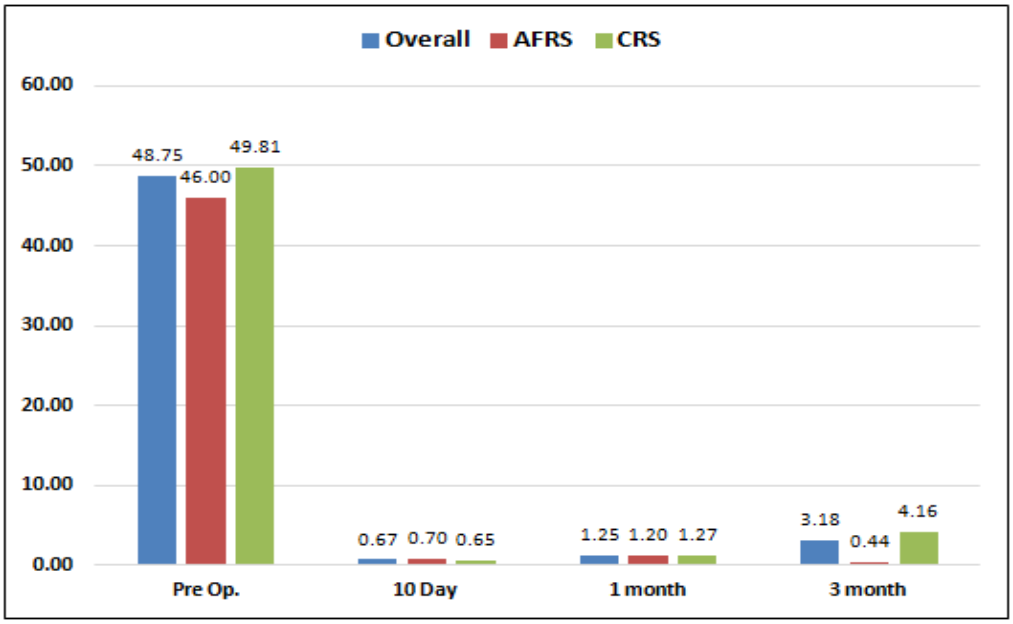
Observations & Results

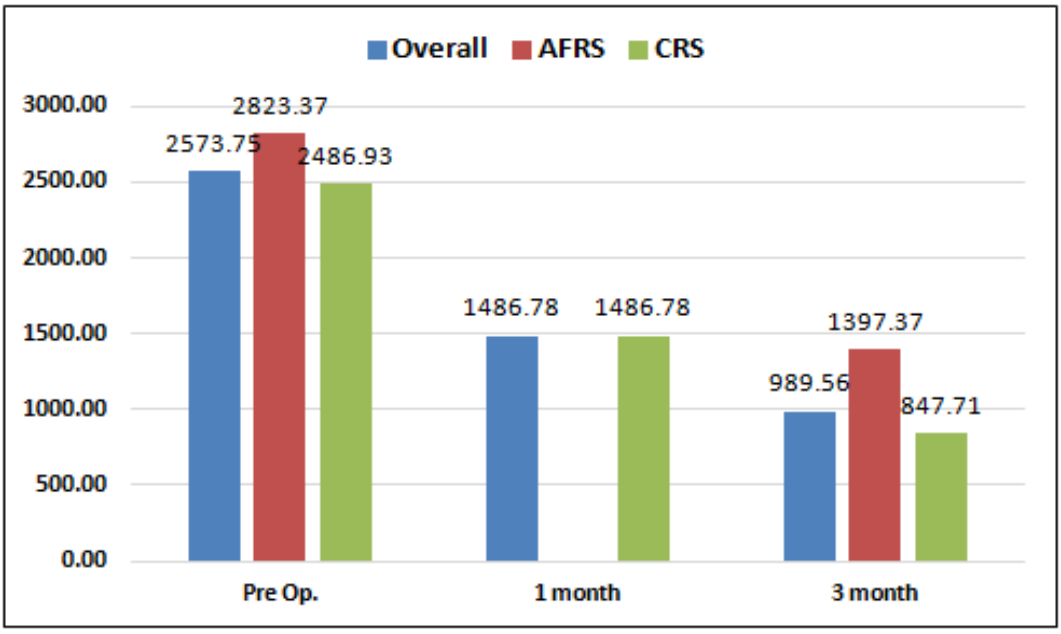
Incidence
- Significant in-patient incidence of both CRS and AFRS observed over five years, with variation based on seasonal and demographic factors.

Symptomatology
- **Top 5 most commonly reported symptoms:**

1. Nasal obstruction
2. Nasal discharge
3. Headache/facial pressure
4. Hyposmia/anosmia
5. Postnasal drip

Outcome Measures
- **SNOT-22 Score**: Demonstrated statistically significant improvement in symptom severity at follow-up intervals post-FESS.
- **Philpott-Javer Score**: Effective in tracking postoperative progress and disease recurrence.
- **Serum Total IgE**: Declined significantly in AFRS patients post-treatment, correlating with symptom relief.
- **Histopathology and Fungal Isolates**:
  - Common findings: Allergic mucin, eosinophilic infiltration.
  - Common isolates: *Aspergillusfumigatus*, *Alternaria*, and *Curvularia*.


Overall
AFRS
CRS
60.00
50.00
40.00
30.00
20.00
10.00
0.00
48.75
46.00
49.81
0.67
0.70
0.65
1.25
1.20
1.27
3.18
0.44
4.16
Pre Op.
10 Day
1 month
3 month


Overall
AFRS
CRS
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2500.00
2000.00
1500.00
1000.00
500.00
0.00
2573.75
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2486.93
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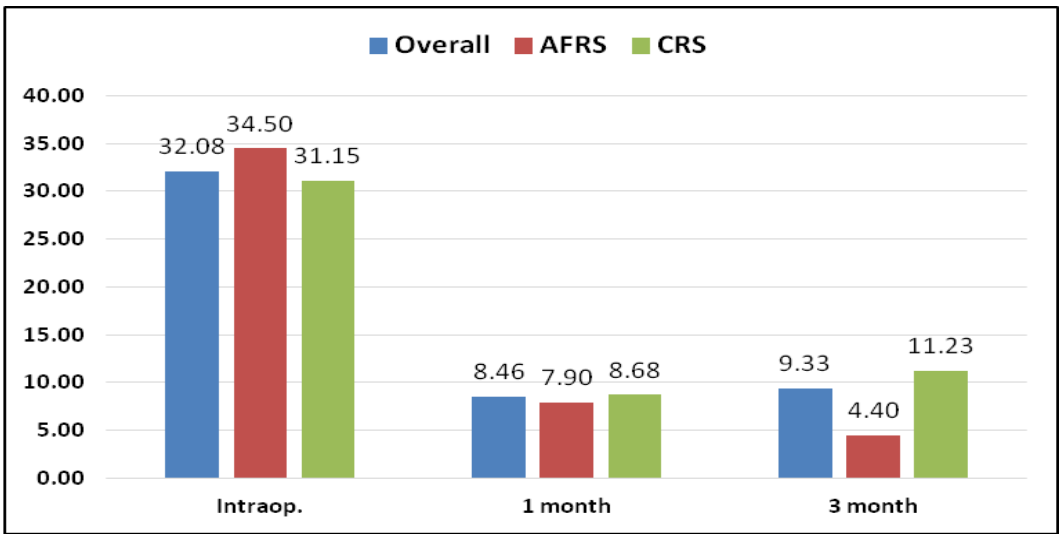
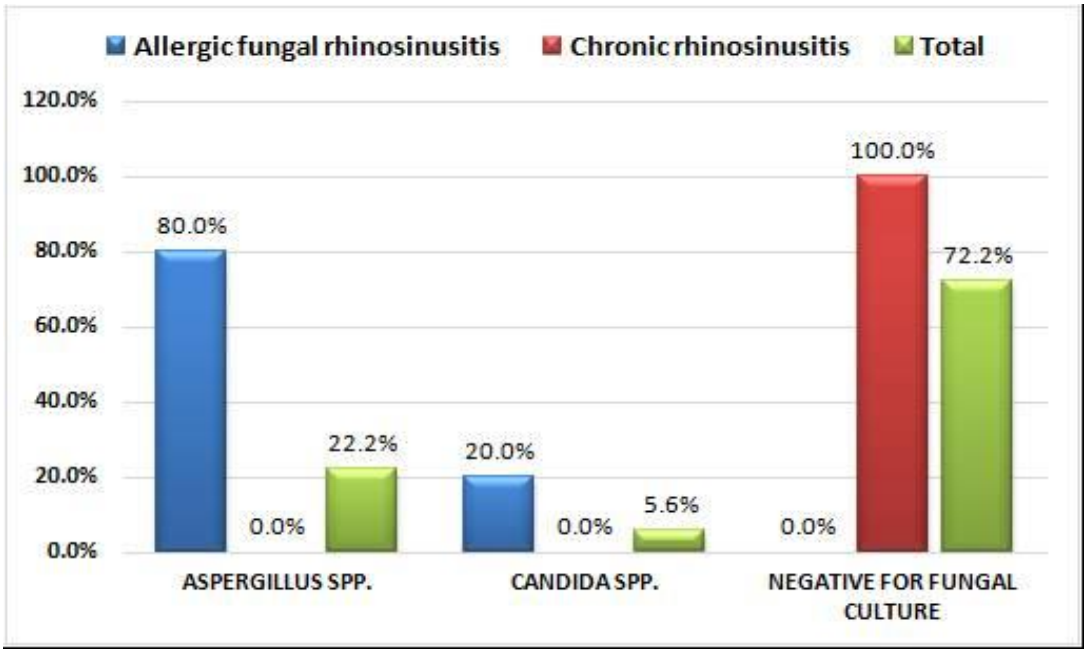
1486.78
989.56
1397.37
847.71
Pre Op.
1 month
3 month


Overall
AFRS
CRS
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
32.08
34.50
31.15
8.46
7.90
8.68
9.33
4.40
11.23
Intraop.
1 month
3 month



Comparative Findings

- **CRSwNP vs CRSsNP vs AFRS**:
  - AFRS exhibited higher preoperative SNOT and Philpott-Javer scores.
  - AFRS patients showed greater postoperative symptom resolution but were at higher risk for recurrence.

Discussion

This study reinforces FESS as a pivotal intervention in CRS/AFRS management. While CRS without nasal polyps responds well to medical management, surgical intervention provides enhanced symptom relief, especially in cases with polyposis or AFRS.

The SNOT-22 and Philpott-Javer staging system serve as reliable tools for assessing disease severity and treatment efficacy. Importantly, the Lund-Mackay CT score, while useful radiologically, complements but does not replace patient-reported outcomes.

Findings also suggest that surgical clearance improves the efficacy of topical therapies by restoring sinus aeration and drainage. This supports the notion of FESS as an enabler of effective postoperative medical management.

Incidence and Clinical Spectrum

Our study revealed a substantial in-patient incidence of CRS and AFRS over a 5-year period. This finding mirrors global trends, where CRS affects up to 12% of the adult population, with a subset presenting to tertiary care centers for surgical intervention. The presence of allergic fungal rhinosinusitis (AFRS) among these patients underscores the importance of considering fungal etiology in recalcitrant or unilateral disease, especially in young immunocompetent individuals from tropical regions like India.

The higher incidence of AFRS in younger age groups (20–40 years) with a male preponderance is in line with previous studies. AFRS, a non-invasive fungal hypersensitivity reaction, is uniquely characterized by eosinophilic mucin, nasal polyposis, and often unilateral sinus involvement on imaging. Radiological hallmarks such as heterogeneously hyperdenseopacification and expansion of sinus walls were prominent among AFRS patients in our cohort.

Diagnostic Challenges and Tools

Diagnosing CRS, and particularly AFRS, demands a multi-modal approach. While symptomatology remains the cornerstone of diagnosis, the addition of objective measures such as nasal endoscopy, CT imaging (Lund-Mackay scoring), and histopathology is critical.

In our study, the Lund-Mackay score provided valuable anatomical assessment but did not always correlate with symptom severity. This finding supports the growing consensus that radiological severity does not always reflect patient discomfort, reinforcing the need for subjective scoring systems like SNOT-22 and the Philpott-Javer (PJ) staging system.

- **SNOT-22**, a validated disease-specific Patient-Reported Outcome Measure (PROM), allowed quantifiable tracking of symptom burden before and after surgery. Significant reduction in scores across follow-ups confirmed substantial symptomatic relief post-FESS.
- **The PJ system**, initially designed to assess extent and distribution of polyps in AFRS, was found to be a sensitive and reproducible method for postoperative monitoring. Its inter-rater reliability has been validated in several international studies and proved useful in our setting for both clinical documentation and academic reporting.

Surgical Outcomes and Postoperative Care

The effectiveness of FESS in CRS and AFRS management is well documented, and our study reaffirms this with statistically significant improvements in SNOT-22 and PJ scores across follow-up intervals. Importantly, the surgical goal is not complete eradication of disease but restoration of normal sinus drainage and mucociliary function, thereby enhancing the efficacy of topical therapies. Several patients with minimal CT findings but severe symptoms experienced substantial relief post-FESS, reinforcing the notion that endoscopic intervention facilitates better topical drug delivery (e.g., steroid irrigations, saline douching), which plays a critical role in controlling mucosal inflammation postoperatively.

Additionally, our debridement protocol, involving regular suction clearance in the early postoperative period, helped minimize crust formation, synechiae, and early recurrences—key contributors to surgical failure.

Immunological and Mycological Insights

AFRS is typified by an elevated IgE response and Type I hypersensitivity to fungal antigens. Our study showed significant preoperative serum total IgE levels in AFRS patients, which declined post-treatment—an indirect marker of reduced antigenic stimulation and successful intervention.

The mycological profile revealed *Aspergillusfumigatus* as the predominant fungal isolate, consistent with other Indian and international studies. This highlights the importance of fungal culture in refractory or recurrent CRS cases. However, fungal culture positivity remains variable, necessitating adjunctive use of histopathology to identify allergic mucin and fungal hyphae.

Recurrence and Long-Term Follow-Up

Disease recurrence, especially in AFRS, remains a formidable challenge. Multiple factors—ongoing allergen exposure, incomplete removal of mucin, poor compliance to medical therapy, and anatomical predispositions—contribute to recurrence. In our cohort, a subset of AFRS patients showed recurrence despite surgery, necessitating revision procedures and intensified medical management.

Importantly, the need for long-term follow-up (≥1 year) cannot be overemphasized. This includes periodic endoscopic surveillance, IgE monitoring, and imaging in selected cases. Early identification of recurrence allows timely intervention, often avoiding the need for revision surgery.

Clinical Implications and Health Policy Considerations

From a clinical standpoint, the findings of our study emphasize:

- The utility of combined surgical and medical management in achieving long-term symptom control.
- The role of PROMs in routine practice to objectively assess treatment response.
- The significance of fungal etiology, particularly in the Indian subcontinent.

From a health system perspective, early surgical intervention, though initially cost-intensive, may be cost-effective over the long term by reducing the burden of repeated antibiotic use, hospitalizations, and productivity loss.

Further, ensuring equitable access to diagnostic tools like nasal endoscopy, imaging, and surgery, especially in rural and underprivileged settings, is vital. Education of primary care providers and ENT trainees regarding AFRS and its mimickers will enhance early recognition and referral.

Summary of Key Points

- CRS and AFRS are common but often underdiagnosed conditions.
- FESS is effective in relieving symptoms and enhancing topical therapy delivery.
- Objective scoring systems (SNOT-22, PJ Score) are critical in patient monitoring.
- AFRS has a higher recurrence risk and requires prolonged follow-up.
- Multidisciplinary and resource-sensitive approaches are key for sustainable outcomes.

Would you like this discussion integrated into a journal-format manuscript (Word/PDF), or do you want tables, graphs, or charts (e.g., SNOT-22 progression, IgE changes, fungal isolate distribution) to be added next?
I can prepare a full submission-ready draft if you specify the target journal or publication format.

Clinical Significance

- Patient Outcome: Access to timely and effective treatment reduces disease burden and enhances quality of life.
- Patient Safety: Minimizes the risk of missed sinonasal complications or occult malignancies.
- Health Economics: Though early surgery increases upfront costs, it potentially reduces long-term expenditure by limiting recurrence and complications.
- Equity of Access: Data supports advocating for resource allocation towards early diagnosis and management.

Conclusion

- CRS and AFRS are prevalent and often underdiagnosed causes of sinonasal morbidity.
- Functional endoscopic sinus surgery, in conjunction with targeted medical therapy, offers substantial and sustained symptom improvement.
- Objective metrics (CT scores, IgE levels) and subjective tools (SNOT-22, Philpott-Javer) should be integrated into routine assessment protocols.
- Recurrence remains a challenge, particularly in AFRS, necessitating long-term follow-up and patient education.

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