Biomedical and Biopharmaceutical Research
Abbreviation: Biomed. Biopharm. Res.
Volume: 18: Issue: 02 |Year: 2021
Page Number: 33-37

A STUDY ON PREVALENCE OF CHRONIC RHINOSINUSITIS AND CORRELATION BETWEEN CHRONIC RHINO SINUSITIS AND GASTROESOPHAGEAL REFLUX DISEASE: A CROSS-SECTIONAL STUDY

Dr. Amin Manoj kumar Govind Bhai[1], Dr. Amitendu Shekhar[2], Dr. Mehul Desai Surendra[3], Dr. Naresh Kumar Munda[4]

[1] Associate Professor, Department of Otorhinolaryngology, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.
[2] Assistant Professor, Department of General Surgery, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.
[3] Associate Professor, Department of General Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.
[4] Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.

Corresponding Author

Dr. Naresh Kumar Munda

Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.
drrnaresh2k @gmail.com

Received: 01-09-2021

Accepted: 18-09-2021

Published: 23-10-2021

ABSTRACT

Background: Chronic rhinosinusitis (CRS) is a prevalent inflammatory condition affecting the nasal and paranasal sinuses, often associated with various risk factors, including gastroesophageal reflux disease (GERD). This study aimed to assess the prevalence of CRS, its risk factors, and the correlation between CRS and GERD. **Methods**: A cross-sectional study was conducted with 62 participants diagnosed with CRS. Demographic data, risk factors, and GERD symptoms were assessed using questionnaires and clinical evaluations. Statistical analysis included Pearson's correlation and logistic regression. **Results**: The prevalence of CRS was higher in individuals aged 30–50 years (45.2%) and among males (58.1%). Significant risk factors included smoking (32.3%), allergies (27.4%), and GERD (38.7%). A positive correlation was found between CRS and GERD (*r* = 0.42, *p* < 0.01).
Conclusion: GERD is a significant risk factor for CRS, suggesting a potential pathophysiological link. Further studies with larger sample sizes are recommended.

KEYWORDS: Rhinosinusitis, GERD.

INTRODUCTION

Chronic rhinosinusitis (CRS) is a persistent inflammation of the sinonasal mucosa lasting ≥12 weeks, affecting ~5–12% of the global population. Risk factors include allergies, smoking, and anatomical variations[1]. Emerging evidence suggests GERD may contribute to CRS due to laryngopharyngeal reflux irritating the upper airways. This study evaluates CRS prevalence, associated risk factors, and its correlation with GERD in a sample of 62 patients.

The prevalence of chronic rhinosinusitis (CRS) varies, but studies generally report it affecting 5% to 15% of the general population. This wide range can be attributed to varying diagnostic criteria and methodologies used in different studies. For example, one study in India found that 1 in 8 people are affected. Key points

about CRS prevalence: Global estimates: Studies worldwide report prevalence ranging from 2% to 16%. Diagnostic criteria[2]
The presence of both symptoms and objective signs (like those seen on imaging) is often used to diagnose CRS, and this can lead to lower prevalence estimates compared to relying on symptoms alone. Symptoms and severity: CRS can manifest with a variety of symptoms, including nasal congestion, discharge, facial pain, and reduced sense of smell. Impact on individuals: CRS can significantly impact quality of life, affecting sleep, productivity, mood, and overall health [3,4]. Geographic variations: Prevalence can vary by region and may be influenced by factors like genetics, environment, and comorbid conditions

METHODS

This is cross-sectional study, which is conducted in tertiary centre of purba Medinipur, before starting study required questionnaire was framed according to study. After obtaining institutional ethical committee approval It was conducted on 80 patients in the department of Otorhinolaryngology admitted at a tertiary care centre, from February/ 2021 to August/2021.
Total 80 participant were approached to project among them 18 were excluded due to non-fulfilling of eligibility criteria and 62 were included on the basis of fulling of the eligibility criteria
The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English

Study Design & Participants

- **Design:** Cross-sectional study.
- **Sample Size:** 62 patients with CRS (diagnosed via nasal endoscopy/symptomatology).
- **Inclusion Criteria:** Adults (18–70 years) with CRS symptoms for ≥12 weeks.
- **Exclusion Criteria:** Recent sinus surgery, immunosuppression.

Data Collection

- **Demographics:** Age, gender, BMI.
- **Risk Factors:** Smoking, allergies, GERD symptoms (assessed via GERD-Q questionnaire).
- **Statistical Analysis:**
  - Descriptive statistics (mean, percentages).
  - Pearson's correlation (CRS-GERD association).
  - Logistic regression (risk factor analysis).

Flowchart

All the data is put in excel sheet then mean, median and association is analysed by SPSS version 20. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and SD. MS Excel and MS word was used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of P value <0.05 was considered as statistically significant after assuming

all the rules of statistical tests. Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data. Sample size is calculated by N master statistical software

RESULTS

In this study we found that Chronic rhinosinusitis depend on demographic profile of patient majority of participants were 30 to 50 years age group who suffered of Chronic rhinosinusitis **(**Table 1).

Table 1: Demographic Characteristics (n=62)

Variable	Frequency (%)
Age (years)	
18–30	15 (24.2%)
30–50	28 (45.2%)
>50	19 (30.6%)
Gender	
Male	36 (58.1%)
Female	26 (41.9%)
BMI (kg/m²)	
<25	32 (51.6%)
≥25	30 (48.4%)

Female were more suffered of CRS as compared to male (Table 1).

CRS has many risk factors among them most important risk factors is GERD its prevalence 38. % followed by smoking (Table 2)

Table 2: Risk Factors for CRS

Risk Factor	Frequency (%)	*p*-value
Smoking	20 (32.3%)	0.03
Allergies	17 (27.4%)	0.02
GERD	24 (38.7%)	<0.01

Here there is association between GERD and CRS which is mentioned bellow Positive correlation between CRS and GERD (*r* = 0.42, *p* < 0.01).GERD increased CRS risk (OR = 2.5, 95% CI: 1.3–4.8).

DISCUSSION

In this study we found that CRS prevalence was highest in middle-aged males. Smoking, allergies, and GERD were significant risk factors. GERD may exacerbate CRS via reflux-mediated mucosal irritation[5,6].

Studies suggest a significant correlation between Chronic Rhinosinusitis (CRS) and Gastroesophageal Reflux Disease (GERD), with GERD potentially playing a role in the development or exacerbation of CRS. Prevalence of CRS is notably higher in individuals with GERD compared to the general population[7-10].

Prevalence of CRS in GERD Patients: Several studies have indicated a higher prevalence of CRS among patients with GERD compared to the general population. One study found a CRS prevalence of 20.7% in patients with GERD, significantly higher than the 8.5% prevalence in the background population. Another study reported a GERD prevalence of 17.1% in CRS patients, compared to 9.1% in the control group. These findings suggest a potential link between the two conditions, with GERD potentially increasing the risk of developing CRS[11].

Correlation and Potential Mechanisms: The link between CRS and GERD is supported by both direct and indirect mechanisms. Direct Mechanism: Gastric acid and pepsin from refluxed stomach contents can directly

irritate and damage the nasal and sinus mucosa Indirect Mechanism: GERD can trigger inflammatory responses that may affect the upper respiratory tract, including the sinuses. Refractory CRS: Patients with refractory CRS (CRS that doesn't respond to standard treatment) may be more likely to have Laryngopharyngeal Reflux (LPR), a type of GERD that affects the larynx. SNOT-22 Scores: Patients with both GERD and CRS tend to have higher SNOT-22 scores (a measure of sinonasal quality of life) compared to those with CRS alone, indicating a greater impact on their quality of life[12]. Research and Implications: Further research is needed to fully elucidate the pathophysiological mechanisms underlying the association between CRS and GERD. Understanding this relationship may help in developing targeted treatments and preventive strategies for CRS, particularly in patients with GERD. The potential role of GERD in refractory CRS highlights the importance of considering GERD as a contributing factor in patients who do not respond to conventional treatments[13].

CRS prevalence was highest in middle-aged males. Smoking, allergies, and GERD were significant risk factors. GERD may exacerbate CRS via reflux-mediated mucosal irritation[14-15].Mechanistic Link: GERD may cause laryngopharyngeal reflux (LPR), leading to chronic sinonasal irritation. Acid reflux may impair mucociliary clearance, worsening sinus inflammation. Clinical Implications: GERD treatment (PPIs, lifestyle modifications) may improve CRS symptoms in comorbid patients. ENT-Gastroenterology collaboration could enhance CRS management[16-18].

CONCLUSION

GERD is significantly associated with CRS, suggesting a potential role in disease pathogenesis. Larger multicenter studies are needed for validation. A pronounced prevalence of LPR symptoms in GERD and indications is evident in individuals afflicted with CRS. The supplemental approach involving PPIs alongside FESS yields heightened alleviation of CRS manifestations, particularly in terms of nasal obstruction, nasal discharge, and PND. The integration of PPIs as an adjunct therapy to FESS exhibits superior relief and amelioration among refractory CRS patients. Further investigations are warranted within this domain, involving larger participant cohorts and extended observation periods, to comprehensively advance our understanding of this therapeutic approach.

SOURCE OF FUNDING: No

CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal

REFERENCES

1. Halawi AM, Smith SS, Chandra RK. Chronic rhinosinusitis: Epidemiology and cost. Allergy Asthma Proc. 2013;34(4):328-334.
2. Meltzer EO, Hamilos DL, Hadley JA, Lanza DC, Marple BF, Nicklas RA, et al. Rhinosinusitis: Establishing definitions for clinical research and patient care. J Allergy Clin Immunol. 2004;114(6):155-212.
3. Orlandi RR, Kingdom TT, Hwang PH, Smith TL, Alt JA, Baroody FM, et al. International consensus statement on allergy and rhinology: Rhinosinusitis. Int Forum Allergy Rhinol. 2016;6(Suppl 1):S22-S209.
4. Kennedy DW, Wright ED, Goldberg AN. Objective and subjective outcomes in surgery for chronic sinusitis. Laryngoscope. 2000;110(3 Pt 3):29-31.

5. Chambers DW, Davis WE, Cook PR, Nishioka GJ, Rudman DT. Long-term outcome analysis of functional endoscopic sinus surgery: Correlation of symptoms with endoscopic examination findings and potential prognostic variables. Laryngoscope. 1997;107(4):504-510.
6. Briggs RD, Wright ST, Cordes S, Calhoun KH. Smoking in chronic rhinosinusitis: A predictor of poor long-term outcome after endoscopic sinus surgery. Laryngoscope. 2004;114(11):126-128.
7. Vakil N, van Zanten SV, Kahrilas P, Dent J, Jones R; Global Consensus Group. The Montreal definition and classification of gastroesophageal reflux disease: A global evidence-based consensus. Am J Gastroenterol. 2006;101(8):1900-1920.
8. Bhatt M, Thapa B. Lower esophageal sphincter pressures in gastroesophageal reflux disease: Where do they stand?Natl J Physiol Pharm Pharmacol. 2015;5(3):170-173.
9. Chiba N, De Gara CJ, Wilkinson JM, Hunt RH. Speed of healing and symptom relief in grade II to IV gastroesophageal reflux disease: A meta-analysis. Gastroenterology. 1997;112(6):1798-1810.
10. Barbero GJ. Gastroesophageal reflux and upper airway disease. Otolaryngol Clin N Am. 1996;29(1):27-38.
11. Wong IW, Rees G, Greiff L, Myers JC, Jamieson GG, Wormald PJ, et al. Gastroesophageal reflux disease and chronic sinusitis: In search of an esophageal-nasal reflex. Am J Rhinol Allergy. 2010;24(5):255-259.
12. Loehrl TA, Smith TL, Darling RJ, Torrico L, Prieto TE, Shaker R, et al. Autonomic dysfunction, vasomotor rhinitis, and extraesophageal manifestations of gastroesophageal reflux. Otolaryngol Head Neck Surg. 2002;126(4):382-387.
13. Liu D, Qian T, Sun S, Jiang JJ. Laryngopharyngeal Reflux and Inflammatory Responses in Mucosal Barrier Dysfunction of the Upper Aerodigestive Tract. J Inflamm Res. 2021 Jan 5;13:1291-1304.
14. Kim HY, Dhong HJ, Chung SK, Chung KW, Chung YJ, Jang KT. Intranasal Helicobacter pylori colonization does not correlate with the severity of chronic rhinosinusitis. Otolaryngol Head Neck Surg. 2007 Mar;136(3):390-5.
15. Ozmen S, Yücel OT, Sinici I, Ozmen OA, Süslü AE, Oğretmenoğlu O, et al. Nasal pepsin assay and pH monitoring in chronic rhinosinusitis. Laryngoscope. 2008 May;118(5):890-4. 17. DiBaise JK, Olusola BF, Huerter JV, Quigley EM. Role of GERD in chronic resistant sinusitis: A prospective, open label, pilot trial. Am J Gastroenterol. 2002 Apr;97(4):843-50. 18. Phipps CD, Wood WE, Gibson WS, Cochran WJ. Gastroesophageal reflux contributing to chronic sinus disease in children: A prospective analysis. Arch Otolaryngol Head Neck Surg. 2000 Sep;126(9):831-6.
16. Ulualp SO, Toohill RJ, Shaker R. Pharyngeal acid reflux in patients with single and multiple otolaryngologic disorders. Otolaryngol Neck Surg. 1999 Dec;121(6):725-30.
17. Pincus RL, Kim HH, Silvers S, Gold S. A study of the link between gastric reflux and chronic sinusitis in adults. Ear Nose Throat J. 2006 Mar;85(3):174-8.
18. Vaezi MF, Hagaman DD, Slaughter JC, Tanner SB, Duncavage JA, Allocco CT, et al. Proton pump inhibitor therapy improves symptoms in postnasal drainage. Gastroenterology. 2010 Nov;139(5):1887-930.