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Characteristics of chronic rhinosinusitis patients at the ENT head and neck polyclinic

Yemima Kristina[1], Yuliani Mardiati Lubis[2], Andika Zayani Tambunan[3], Naomi Grace Rezeki[4]
[1,2,3,4]Medical Education Study Program, Faculty of Medicine, Universitas Prima Indonesia, Medan, Indonesia

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ABSTRACT

Background: Chronic rhinosinusitis (CRS) is a long-lasting inflammatory disorder affecting the nasal passages, paranasal sinuses, and upper respiratory tract, marked by symptoms persisting for a minimum of 12 weeks. The purpose of this study is to identify the characteristics of chronic rhinosinusitis patients at the ENT Head and Neck Polyclinic at ROYAL PRIMA Hospital, Medan. Methods: A descriptive research design with a retrospective data collection method was used through secondary data. The population comprised medical records of patients diagnosed with chronic rhinosinusitis at the outpatient polyclinic during the 2021-2022 period, totaling 80 records. Data were collected using purposive sampling, selecting the most complete medical records. Results: The distribution of chronic rhinosinusitis patients showed that the largest age group was 20-29 years (28.4%). Females were more affected (59.7%) than males (40.3%). The most common primary complaint was nasal congestion (28.4%), with the maxillary sinus being the most infected (47.8%). Medical treatment was predominant (55.2%) compared to surgical intervention (turbinectomy) at (44.8%), emphasizing the need for patient evaluation to ensure appropriate treatment. Conclusions: This study provides an overview of chronic rhinosinusitis (CRS) patients, highlighting that those aged 20-29 years are most affected, with a notable prevalence among females (59.7%). The primary complaints include nasal obstruction, facial pain, and headaches, often linked to inflammation and blockage in the sinus pathways. Treatment typically involves pharmacological therapy, while surgery is reserved for those with more severe cases, emphasizing the need for tailored management strategies.

Corresponding Author:

Yemima Kristina,
Faculty of Medicine,
Universitas Prima Indonesia,
Jl. Sampul No. 3, Sei Putih Baru., Kec. Medan Petisah, Kota Medan, 20118, Indonesia
Email: yemimakristina1012@gmail.com

INTRODUCTION

Chronic rhinosinusitis (CRS) is a pathological condition characterized by persistent inflammation of the nasal mucosa and the adjacent paranasal sinuses for more than 12 weeks (Schleimer, 2017). This condition results in symptoms that can profoundly disrupt an individual's quality of life.

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Common symptoms of CRS include facial pain, reduced sense of smell (hypo- or anosmia), nasal discharge, and nasal obstruction that impedes breathing (Sedaghat, 2024). According to Hirsch et al. (2017), a study conducted in the United States using European Position Paper on Rhinosinusitis (EPOS) guidelines found that 11.9% of 23,700 patients met the criteria for CRS. The highest incidence occurred in patients aged 50-59 years (15.9%), with a decline observed in patients aged 69 and above (6.8%). CRS can significantly impact daily life and varies in prevalence across different countries (Sa'dyah & Himayani, 2023).

In (Zhang et al., 2023) undertook a comprehensive systematic review and meta-analysis to ascertain the prevalence and identify the risk factors associated with chronic rhinosinusitis (CRS) within the Chinese demographic. This study, which analyzed 12 relevant studies involving 4,033 patients, found an overall prevalence of 10%. Chronic rhinosinusitis is influenced by a variety of predispositional factors, including allergens, asthma, non-steroidal anti-inflammatory drugs (NSAIDs), NSAID-exacerbated respiratory disease (N-ERD), immunodeficiency, gastro-esophageal reflux disease (GERD), anatomical variations in the nose, microbiological factors (bacteria, biofilms, fungi, viruses), and smoking. Smoking, air pollution from vehicle emissions and industrial activities, and occupational dust exposure significantly increase the risk of developing CRS (Fokkens et al., 2020). Additionally, the high incidence of CRS significantly affects patients' quality of life, often leading to sleep disturbances, such as the need to frequently clear the nasal passages during the night (Setiawan & Sudarsih, 2024).

Numerous studies have examined the correlation between chronic rhinosinusitis (CRS) and quality of life, emphasizing the profound impact on sleep patterns and the interference with routine daily activities (Kemenkes RI, 2022). Despite the high prevalence and significant impact of CRS on quality of life, diagnosing the condition requires careful differentiation from other nasal inflammatory diseases due to overlapping symptoms (Chee et al., 2022)(Hofstee et al., 2020). In Indonesia, a study by Andhini (2020)(yang diamati Nilai, n.d.) identified a high incidence of CRS in several hospitals. The investigation uncovered that the predominant cohort of chronic rhinosinusitis (CRS) patients fell within the age range of 15 to 65 years, a demographic associated with high productivity. The most prevalent symptom observed was nasal obstruction, affecting 70.5% of the patients, while the maxillary sinus emerged as the most commonly implicated, with 56.9% of cases (Yan et al., 2018).

Due to the high prevalence of CRS in Indonesia, particularly with symptoms like nasal obstruction and headache, further research is essentisl to understand the characteristics of CRS patients more clearly. This study, focusing on patients attending the ENT Polyclinic at Royal Prima Hospital Medan during the 2021-2022 period, aims to contribute valuable data to inform more effective health policies and medical management for CRS patients. This research is essential for expanding our understanding of CRS, a medical condition that can significantly impair quality of life, and for addressing the significant public health issue it presents (Yulianarrahma et al., 2019).

The purpose of this study is to fill the existing gap in understanding the epidemiology and management of CRS in Indonesia, particularly in the Medan region. By exploring the distribution of CRS cases based on age, gender, primary symptoms, affected sinus locations, and treatment modalities (medication vs. surgery), the study aims to provide a comprehensive overview of CRS in this population. The findings will also help optimize prevention and treatment strategies, particularly in understanding the demographic factors that may influence disease onset and progression (Chmielewski, 2023).

The study will also contribute to the broader body of research by complementing existing studies on CRS in other countries (Hirsch et al., 2017)(Zhang et al., 2023) and helping to establish localized data for the Indonesian context. Given the high prevalence of CRS in Indonesia and its impact on patients' daily lives, this study holds the potential to influence both clinical practice and public health policy.

RESEARCH METHOD

In this study, the researcher adopts a non-experimental research design, specifically using a descriptive approach. The data collection method will be retrospective, utilizing secondary data that has already been available. This approach allows the researcher to analyze existing information, providing a clear picture of the researched topic without conducting direct experiments. The study will focus on chronic rhinosinusitis, with an exploration of patient demographics such as age and gender, along with the symptoms, location of sinus involvement, and treatments given. Data will be collected from medical records, which will provide a comprehensive understanding of the condition and treatment approaches.

The research will be conducted at the medical record unit of Royal Prima General Hospital in Medan. This location was chosen due to its access to relevant data and its capacity to allow efficient data collection. The research is scheduled to begin with planning in December 2023 and will proceed through data collection and processing until October 2024. The study's population consists of all patients diagnosed with chronic rhinosinusitis and receiving treatment at the ENT polyclinicof the hospital. The sample will include those who meet the inclusion criteria, which require a complete medical record and a diagnosis of chronic rhinosinusitis confirmed by an ENT specialist. Patients with concurrent conditions, such as tumors, or those who have undergone previous surgeries, will be excluded from the study.

The sampling technique will involve consecutive sampling, where patients are selected in sequence based on predefined criteria until the required sample size is reached. The sample size will be calculated using Slovin's formula to ensure the results are representative and reflect the broader population. The information used in this study was obtained through secondary data derived from patient's medical records spanning from January 2021 to December 2022. This data includes patient demographics, complaints, affected sinus locations, and the type of treatment administered, which will be further analyzed.

Data processing involves a systematic approach, starting with editing to ensure accuracy and completeness. The data will then be coded for easier classification, with specific codes assigned to categories such as age, gender, primary complaints, affected sinus location, and treatment type. After coding, the data will be entered into a software program for analysis, followed by cleaning to identify and correct any errors or inconsistencies. The analysis will employ univariate analysis to describe the characteristics of each variable independently. The results will be presented narratively and in frequency distribution tables to provide a structured view of the data.

The research methodology involves several stages: planning, execution, and data analysis. Planning includes identifying the research problem, determining the sample and population, and obtaining ethical approval. The execution phase involves collecting data from medical records, ensuring the inclusion criteria are met, and applying the consecutive sampling method. Data will then be analyzed using statistical software, specifically SPSS version 26.0, to present descriptive statistics that reflect the distribution and tendencies of the data. This approach ensures that the results are both accurate and useful for understanding the key trends in chronic rhinosinusitis treatments and patient characteristics.

RESULTS AND DISCUSSIONS

Table 1. Distribution of chronic rhinosinusitis patients based on age group

No.	Age Group	N	%
1.	10-19	13	19.4
2.	20-29	19	28.4
3.	30-39	10	14.9
4.	40-49	12	17.9
5.	50-59	8	11.9

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No.	Age Group	N	%
6.	>60	5	7.5
Total		67	100

(Note: N = Number, % = Percentage)

In Table 1 above, the categorization of chronic rhinosinusitis (CRS) patients according to age demographics shows that the highest occurrence of CRS is in the 20-29 age group, with 19 individuals (28.4%). The lowest occurrence is found in the age group above 60 years, with 5 individuals (7.5%). This observation corroborates findings from prior research at Atmajaya Hospital, where an analysis of 76 medical records revealed that the predominant cohort of CRS patients was within the 18-35 age range, comprising 37 individuals (50.7%). Similarly, the results of this study are congruent with those of (Tobing, 2023), which identified the 36-45 age group as having the highest prevalence of CRS, followed by the 26-35 age group. Additionally, a 2020 study by Samara et al. (Valdés Pérez & Tewfik, 2018)mirrored these findings, with the 36-45 age group exhibiting the greatest incidence of CRS, accounting for 25.58%. Further corroborating this trend, research by Nugraha et al. (2021), conducted at the ENT Head and Neck Polyclinic at Dr. M. Djamil Hospital from 2017-2019, indicated that the most common age group for CRS patients was 46-55 years (22%), with the least occurrence found in those aged over 65 years (5.4%).

The decline in sinonasal physiological function and anatomical changes in the nose with age contribute to the risk of infections in such cases. Moreover, aging brings changes in lifestyle, diet, and increased susceptibility to infections. EPOS 2020 also stated that the incidence of chronic rhinosinusitis increases in adults (age >18), with a significant rise in cases above the age of 40. In Europe, the incidence of chronic rhinosinusitis decreases after the age of 55, while in America, the incidence decreases after 65 years.

Environmental factors such as air pollution, dust, cigarette smoke, and dry or cold conditions can damage cilia in the respiratory tract and cause changes in the nasal mucosa, making individuals, especially younger ones, more vulnerable to the development of chronic rhinosinusitis (Scott-Brown, 2008). As people age, the risk of developing chronic rhinosinusitis increases due to drying of the respiratory tract and weakening of the cartilage supporting the airway structure. Additionally, the body's decreasing ability to respond to changes in air temperature contributes to reduced immunity against infections, making respiratory infections more likely (Petriz et al., 2024).

Table 2. Distribution of chronic rhinosinusitis patients based on gender

No.	Gender	N	%
1.	Female	40	59.7
2.	Male	27	40.3
Total		67	100

(Note: N = Number, % = Percentage)

Table 2 demonstrations that chronic rhinosinusitis occurs more frequently in females, with 40 females (59.7%) and 27 males (40.3%). This result is consistent with a study on the characteristics of CRS patients in the ENT Head and Neck Polyclinicat Royal Prima Hospital Medan in 2021-2022, which found 40 female patients (59.7%) and 27 male patients (40.3%). A similar study conducted at RSUD Dr. Zainoel Abidin in Banda Aceh, involving 335 CRS patients, showed 188 females (56.12%) and 147 males (43.88%) (Riskia, 2022).

A study by (Lasminingrum et al., 2019) at RSUP Dr. Hasan Sadikin in Bandung also indicated a higher prevalence of CRS in females. Among 29 study subjects, 13 were male (45%) and 16 were female (55%). This finding is corroborated by a research study showing that 52.6% of CRS patients were female (Chang et al., 2018). According to Fokkens et al. (2020), the higher prevalence of CRS in females is influenced by hormonal factors. While the exact pathogenesis of the disease is not fully understood, some theories suggest that estrogen, progesterone, and placental growth

hormone affect the nasal mucosa and vascular changes, contributing to the development of rhinosinusitis.

The difference in CRS prevalence between males and females may also be due to differences in healthcare-seeking behavior. Females are generally more proactive about seeking medical help for their symptoms, which may explain the higher number of female CRS patients. In China, CRS is a significant health issue, affecting an estimated 107 million people. A study in seven Chinese cities found that CRS was more common in individuals with certain medical conditions such as allergic rhinitis, asthma, COPD, and even gout. The study found that males had a higher CRS incidence (8.79%) compared to females (7.28%) (Shi et al., 2018).

Table 3. Distribution of chronic rhinosinusitis patients based on main symptoms

No.	Main Symptom	N	%
1.	Thick mucus	8	11.9
2.	Nasal congestion	19	28.4
3.	Hyposmia	5	7.5
4.	Facial pain	14	20.9
5.	Headache	11	16.4
6.	Ear pain	1	1.5
7.	Tooth pain	3	4.5
8.	Halitosis	6	9.0
Total		67	100

(Note: N = Number, % = Percentage)

In Table 3, the main symptom reported most frequently by CRS patients is nasal congestion, which was noted in 19 patients, accounting for 28.4% of the total sample. This outcome aligns with a prior study conducted by (Leslie et al., 2022) at Royal Prima Hospital Medan, in which nasal congestion emerged as the predominant complaint, often accompanied by headache and purulent discharge, affecting 18 patients (32.1%).

According to Soepardi, rhinosinusitis begins with an inflammatory reaction that leads to edema in the organs forming the ostiomeatal complex (OMC), which is crucial for mucus transport. Oxygen pressure plays a role in preventing bacterial growth, and OMC helps maintain this process. If mechanical obstruction occurs in the OMC due to anatomical abnormalities or mucosal edema, the cilia cannot move, and the ostium becomes blocked, leading to nasal congestion as a primary symptom.

The swelling or edema in the mucosa disrupts normal respiratory system function, especially when it involves the OMC. The edema causes the mucosa to come into contact, blocking ciliary movement and impairing sinus drainage. As a result, the ostium becomes blocked, leading to a buildup of mucus and fluids (Smith & Kadriyan, 2023).

Chandra highlights that predisposing factors exert a substantial influence on the progression of chronic rhinosinusitis. These factors can be local (e.g., infection, allergy, anatomical abnormalities, tumors, foreign bodies, pollutants, or mucociliary dysfunction) or systemic (e.g., immune system disorders, diabetes, AIDS, and use of medications that may block nasal passages) (Hardiansyah, 2018).

Table 4. Distribution of chronic rhinosinusitis patients based on sinus location

No.	Sinus Location	N	%
1.	Ethmoid	9	13.4
2.	Frontal	13	19.4
3.	Maxillary	32	47.8
4.	Sphenoid	13	19.4
Total		67	100

(Note: N = Number, % = Percentage)

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In Table 4 presented above, the categorization of chronic rhinosinusitis patients according to the site of sinus involvement is delineated. The data indicates that the maxillary sinus emerges as the predominant site of infection, comprising 32 instances, or approximately 47.8% of the overall sample. This observation corroborates the findings of the research conducted by (Amelia et al., 2017), which identified maxillary rhinosinusitis as the most frequently occurring subtype, with 21 cases (28.8%) out of a total sample of 73 individuals. Similarly, Leslie et al. (2022), in their study based on the population of inpatient medical records at Royal Prima Hospital in 2021, found that the most common type of rhinosinusitis was maxillary rhinosinusitis, affecting 50 patients (89.3%) out of 112 cases.

According to (Inthavong, 2008), the maxillary sinus is the largest paranasal sinus located in the face, and it plays a crucial role in the upper respiratory system. Due to its size, it is often the primary site affected in chronic rhinosinusitis cases. The ostium of the maxillary sinus, a diminutive conduit linking the sinus to the nasal cavity, is situated at a higher elevation than the sinus's base. This anatomical configuration signifies that the drainage of the sinus is predominantly reliant on the action of cilia and must traverse a constricted infundibulum.This makes sinus drainage more difficult if inflammation or swelling occurs. Additionally, the lower border of the maxillary sinus is located near the roots of the upper teeth, making the sinus vulnerable to the spread of infections from dental issues, such as odontogenic abscesses.

Dental infections can lead to rhinosinusitis, which, if left untreated, can progress into chronic rhinosinusitis. This demonstrates the importance of the anatomical relationship between the maxillary sinus and surrounding structures in the development of infections that can become chronic.

Table 5. Distribution of chronic rhinosinusitis patients based on management group

No.	Management Type	N	%
1.	Medical	37	55.2
2.	Operative	30	44.8
Total		67	100

(Note: N = Number, % = Percentage)

In Table 5, the distribution of chronic rhinosinusitis patients based on the management type shows two main approaches: medical and operative treatments. The results indicate that medical management is the most commonly used approach, with a proportion of 55.2%, or 37 patients. This reflects the initial approach in treating chronic rhinosinusitis, which typically involves using medications to reduce symptoms and inflammation. On the other hand, operative management, which includes surgical procedures to address more complex issues or cases that do not respond to medical treatment, accounts for 44.8% with 30 patients. This suggests that although medical management is dominant, a significant number of patients require surgical intervention to achieve better outcomes.

Overall, the data emphasize the importance of comprehensive evaluation of patient conditions to determine the most appropriate management strategy, as well as the need for further research to understand the factors influencing treatment decisions. This study aligns with Leslie et al. (2022), which found that the most common treatment for rhinosinusitis was medicamentous therapy. The pharmacological intervention encompassed a regimen of cefadroxil, ketorolac, and metronidazole in 21 patients (37.5%), whereas a turbinectomy was executed in 32 patients (64%).

Based on the data in Table. 5, medicamentous management is given more frequently to chronic rhinosinusitis patients because it aligns with the Indonesian ENT-Head and Neck Specialist Association Guidelines, which recommend a 7-day course of antibiotics and other additional therapies. If improvement is seen, antibiotics may be continued for 7-14 days. Nonetheless, in the absence of clinical improvement, additional diagnostic assessment is imperative to ascertain the underlying etiology, or alternatively, surgical interventions such as

Functional Endoscopic Sinus Surgery (FESS), inferior meatus antrostomy, or the Caldwell-Luc procedure may be warranted.

Therefore, the higher proportion of medical therapy is likely due to its effectiveness in the first two weeks for most patients. In contrast, surgical interventions are considered if no improvement is observed after two weeks or if there are signs of ostium obstruction that cannot be addressed with medication alone. Absolute indications for surgery include rhinosinusitis with complications, allergic or invasive fungal rhinosinusitis, extensive mucoceles, and suspected neoplasms. Relative indications for surgery include chronic rhinosinusitis or recurrent symptomatic rhinosinusitis, as well as symptomatic nasal polyps that do not respond to medical treatments (Kusumawijaya & Magdi, 2019).

This finding contrasts with research by (Nugraha et al., 2021), which found that 166 patients (69.5%) underwent surgical therapy, and 73 patients (30.5%) received medicamentous therapy. This study found that chronic rhinosinusitis patients whose conditions did not improve after medicamentous treatment required surgical therapy, especially patients with nasal polyps. The high failure rate of medicamentous therapy was attributed to mucosal remodeling processes in patients, even after undergoing BESF surgery. Moreover, patient adherence and participation in treatment are key to the success of managing this disease. Adherence to medication, nasal irrigation, doctor visits, and preventive actions such as avoiding exposure to risk factors, controlling comorbid conditions, and careful review of ongoing treatments are essential for effective management.

CONCLUSION

In conclusion, this study reveals key findings about the distribution, symptoms, and management of chronic rhinosinusitis (CRS). The highest prevalence of CRS occurs in the 26-45 age group, with a higher incidence in females, consistent with previous research. The most common symptoms are nasal congestion, followed by facial pain and headache. The maxillary sinus is the most frequently affected sinus, and the majority of patients are initially treated with medicamentous therapy, with a notable portion requiring surgical intervention for more complex cases. The research contributes to a better understanding of CRS patient demographics, symptom patterns, and management strategies, providing valuable insights for clinical practice. It highlights the need for personalized treatment approaches based on patient characteristics and the severity of CRS. Nevertheless, the study is not without its limitations, including a relatively modest sample size and a regionally confined scope, factors that may potentially undermine the broader applicability of the results. Future research should explore larger, more diverse populations and examine the long-term outcomes of different treatment modalities to improve CRS management further. This study's contribution lies in reinforcing the importance of a comprehensive, patient-tailored approach to CRS treatment, as well as identifying areas for further exploration in the pathophysiology and management of the disease.

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