CHARACTERISTICS OF CHRONIC RINOSINUSITIS PATIENTS AT OUTPATIENT CLINIC HASAN SADIKIN GENERAL HOSPITAL BANDUNG IN JANUARY 2019 – DECEMBER 2021

*Anis Nurul Farida, Arif Dermawan, Sinta Sari Ratunanda, Nur Akbar**

[1]Department of Otorhinolaryngology-Head and Neck Surgery Faculty of Medicine, Universitas Padjadjaran/Hasan Sadikin General Hospital, Indonesia

Abstract

Chronic rhinosinusitis (CRS) is an inflammation of the nasal mucosa and paranasal sinuses for more than 12 weeks. It is important to know the CRS phenotype for understanding the CRS endotype so the management of CRS patients can be better. This study aims to determine the characteristics of CRS outpatients in RSHS Bandung in January 2019-December 2021. This study is a retrospective descriptive research conducted at Hasan Sadikin General Hospital Bandung. The data obtained by total sampling of 252 patients from medical record patients in January 2019 - December 2021. The data is analyzed and presented in the form of tables by using Microsoft Excel 2019. Out of 252 patients, the largest age group was 20-29 (22.2%) and male (53.6%) is the most common gender. The most common major complaint was nasal congestion (53.6%). CRS without nasal polyps (58.3%) is the most common type. Nasal irrigation and corticosteroids is administered in all cases (100%) and amoxycilline clavulanate antibiotics in 62.7% cases. Visual Analogue Scale (VAS) on pre therapeutic is the most on all symptoms (nasal congestion, runny nose, facial pain and smell disorders). 100% of patients in this study had a total nasoendoscopy score of more than 1 which means the cases was a chronic rhinosinusitis. CRS is a chronic inflammation that can lead to socioeconomic disorders, quality of life, and high morbidity, so it is necessary to understand the characteristics of CRS patients for better management.

Keywords: *Chronic Rhinosinusitis, Phenotype, Visual Analogue Scale, Nasoendoscopy Score.*

Introduction

Chronic rhinosinusitis (CRS) is a persistent inflammatory condition affecting the nasal mucosa and paranasal sinuses for more than 12 weeks. It is characterized by symptoms like nasal congestion, runny nose, facial pain, and impaired sense of smell. Diagnosis involves nasoendoscopy, which can reveal nasal polyps, thick mucus discharge, and mucosal swelling. Tomographic imaging techniques like CT scans can further assess the condition of the nasal mucosa and sinuses, providing insights into the extent and nature of inflammation in CRS.[1]

Chronic rhinosinusitis (CRS) represents a significant global health issue characterized by a substantial impact on quality of life, socioeconomic factors, and a notable burden of illness resulting in escalated healthcare expenditures and reduced work productivity.[2] In 2014, the global prevalence of chronic rhinosinusitis (CRS) was documented at 15%. However, regional variations were observed, with the United States, Canada, and South Korea reporting prevalence rates of 15%, 9.1%, and 1.01% respectively in 2012. It is noteworthy that the incidence of CRS tends to rise with advancing age, reaching its highest point within the 50-59-year age group, and subsequently starts to decline in individuals aged 60 years and above.[3]

In 2004, the prevalence of chronic rhinosinusitis (CRS) in Indonesia was documented at 12.6%, indicating a considerable population of approximately 30 million individuals affected by this condition. Within the Rhinology-Allergy Division of the Ear, Nose, Throat, and Head and Neck Surgery department at Hasan Sadikin General Hospital, the prevalence of CRS was reported as 14% in 2015. Subsequently, in 2016, there was an observed increase in prevalence, reaching 16%. Similarly, in 2017, the prevalence of self-reported sinusitis (SSR) did not exhibit significant variation, remaining relatively stable at 16.2%.[4,5]

Chronic rhinosinusitis (CRS) is a multifaceted and diverse disease characterized by various phenotypes and endotypes. It is crucial to adopt a phenotypic approach for diagnosing CRS, as it allows for a more comprehensive understanding of the specific CRS endotype. This enhanced understanding is essential for improved management strategies. The progressive comprehension of the endotypic pathogenesis of CRS has led to significant advancements, including the introduction of efficacious biologic agents that have shown effectiveness in the management of CRS.[6]

In the traditional method, chronic rhinosinusitis (CRS) is often categorized into two distinct types: CRS accompanied by nasal polyps and CRS lacking nasal polyps. While this classification fails to capture the diverse array of underlying endotypes, it remains a straightforward and practical method that clinicians can readily recognize and utilize for diagnostic purposes..[6] Additionally, there exist more specific subtypes of chronic rhinosinusitis (CRS), such as cystic fibrosis, allergic fungal rhinosinusitis, and aspirin-exacerbated respiratory disease. However, these subtypes fall outside the purview of the present review. It is important to note that the clinical symptoms experienced by individual patients can differ greatly in terms of their nature, severity, and frequency.[7]

Y. A. Dewi et al. (eds.), *Proceedings of the 19th Otorhinolaryngology Head and Neck Surgery National Congress (PERHATIKL 2022)*,
Advances in Health Sciences Research 68,
https://doi.org/10.2991/978-94-6463-280-4_57

According to a study conducted by Cho et al.[8], chronic rhinosinusitis (CRS) is primarily a medical condition that necessitates a thorough assessment of the patient's medical history and physical examination to identify any comorbid conditions that may be linked to or increase the susceptibility to CRS. By identifying the specific phenotype of CRS, healthcare professionals can establish an accurate diagnosis and develop an appropriate treatment plan tailored to the individual's needs. Furthermore, the introduction of rhinolaryngoscopy, a novel diagnostic tool, has significantly enhanced the diagnostic capabilities for CRS. This tool allows doctors from various specialties to easily and effectively confirm the presence of CRS and initiate appropriate treatment measures. With rhinolaryngoscopy, medical professionals can visualize the nasal passages and larynx, enabling them to assess the extent of inflammation and identify any structural abnormalities that may contribute to the development or persistence of CRS. The incorporation of rhinolaryngoscopy into the diagnostic process offers several advantages. Firstly, it provides a non-invasive and relatively simple method of examination that can be performed in an outpatient setting. This means that any doctor, regardless of their specialty, can utilize this tool to diagnose and manage CRS, eliminating the need for patients to seek specialized care from an otolaryngologist in every instance. Additionally, rhinolaryngoscopy allows for real-time visualization of the nasal cavity and larynx, aiding in the accurate identification of CRS and its associated features, such as nasal polyps or mucosal inflammation. By expanding the accessibility of diagnostic tools like rhinolaryngoscopy, healthcare professionals can improve the efficiency and effectiveness of diagnosing CRS, leading to prompt and appropriate treatment interventions. This advancement in diagnostic capabilities ultimately benefits patients by enabling early identification and management of CRS, thus reducing the burden of symptoms and improving their overall quality of life.

Based on what has been mentioned above and considering the incidence of CRS almost always increases, hence, this study aims to determine the characteristics of CSR patients at the Outpatient Clinic Hasan Sadikin General Hospital Bandung in January 2019-July 2020.

Method

This study is a descriptive study with a retrospective method to see the characteristics of CRS patients at the outpatient clinic Hasan Sadikin General Hospital Bandung. The sampling technique used is total sampling from medical record data of patients with CRS for the period January 1, 2019 –December 31, 2021.

The inclusion criteria were in the form of medical record data of patients with CRS. Meanwhile, the exclusion criteria were incomplete or missing medical record data.

The data taken from the patient's medical record were age, gender, chief complaint, management, type of rhinosinusitis, disease severity (VAS) and nasoendoscopy score. Then, the data will be analyzed using descriptive statistics. The data will be processed using statistical software (Microsoft® Excel 2019 and IBM® SPSS® version 22) and displayed in the tables.

Results

The research subjects consisted of 259 medical record data, which included the inclusion criteria as many as 252 medical record data and exclusion data as many as 7 medical record data according to the criteria of the research subject.

General characteristics of research subjects can be seen in Table 1 with the characteristics recorded in this study including the age and gender

Table 1. Characteristis of Patients with chronic rhinosinusitis

	Characteristics	Total (n=252)	%
1.	Gender :		
	Male	135	53,6
	Female	117	46,4
2.	Age (years) :		
	<10	7	2,8
	10-19	34	13,5
	20-29	56	22,2
	30-39	44	17,5
	40-49	39	15,5
	50-59	42	16,7
	≥60	30	11,9

Table 1 shows in this study, it was found that there were more male patients (53.6%) than female patients (46.4%).

The average age of the patients was 37.51 ± 17.39 years with the largest age distribution being in the age group of 20-29 years as many as 56 (22.2%) people. Meanwhile, in the age group less than 10 years, the age group with the smallest distribution was 7 patients (2.8%). In the age group of 30-39 years as many as 44 (17.5%) cases, in the age group of 40-49 years as many as 39 (15.5%) cases and in the age group of 50-59 years as many as 42 (16.7%) cases. Meanwhile, in the age group above or equal to 60 years, it tends to decrease by 30 (11.9%) cases. This shows that the incidence of CRS is mostly experienced by patients of productive age.

Table 2. Chief Complaint and Management of CRS patients

	Characteristics	Total	%
1.	Chief complaints:		
	Nasal congestion	139	55,1

Rhinorrhea	65	25,8
Facial pain	38	15,1
Olfactory disturbance	2	0,8
Headache	1	0,4
Others	7	2,8
2. Management:		
a. Nasal irrigation		
Yes	252	100
No	0	0
b. Intranasal corticosteroid		
Yes	252	100
No	0	0
c. Amoxicillin clavulanic		
Yes	158	62,7
No	94	37,3

Table 2 shows The chief complaints in CRS patients include nasal congestion, rhinorrhea, facial pain, olfactory disturbances, facial pain and other complaints. The most common chief complaints were nasal congestion, 139 cases (55.1%), rhinorrhea in 65 cases (25.8%), facial pain in 38 cases (15.1%), olfactory disturbances in 2 cases (0 ,8%), Headache was 1 case (0.4%), and other complaints were 7 cases (2.8%).

The distribution of CRS patients based on management included nasal irrigation therapy, intranasal corticosteroids and amoxicillin clavulanate. In 252 cases (100%) treated with nasal irrigation and intranasal corticosteroids, while those receiving amoxicillin clavulanate therapy in this study were 158 (62.7%) cases of chronic rhinosinusitis patients.

Table 3. Types of Rhinosinusitis

Characteristics	Total	%
Types of Rhinosinusitis :		
CRS with nasal polyps	46	18,3
CRS without nasal polyps	147	58,3
Allergic rhinosinusitis	59	23,4

Table 3 shows the distribution of chronic rhinosinusitis patients by type of rhinosinusitis. The most chronic rhinosinusitis patients found were chronic rhinosinusitis without nasal polyps in 147 (58.3%) cases, chronic rhinosinusitis patients followed by allergic rhinosinusitis 59 (23.4%) cases and the least was chronic rhinosinusitis with nasal polyps, 46 (18.3%) cases.

Table 4 shows the results of the pre-therapy VAS score, the most were moderate degree of nasal congestion complaints of 150 people (59.5%), the most mild degree of rhinorrhea complaints of 178 people (70.6%), the most complaints of facial pain in the mild degree of 252 people (100%) and olfactory disturbances were mostly the same in mild degrees of 248 people (98.4%). After therapy, there was a decrease in the all VAS score symptoms, this situation was seen from the decrease in the VAS score of severe and moderate degrees in all complaints, the presentation decreased.

Table 4. VAS score on all research subjects (n=252)

Severity		Nasal congestion	Rhinonrrhea	Facial pain	Olfactory disturbance
Mild	Pre therapy(%)	93(36,9%)	178(70,6%)	252(100%)	248(98,4%)
	Post therapy (%)	170(67,2%)	197(78%)	0(0%)	252(100%)
Moderate	Pre therapy (%)	150(59,5%)	74(29,4%)	0(0%)	4(1,6%)
	Post therapy (%)	82(32,8%)	55(22,0%)	0(0%)	0(0%)
Severe	Pre therapy (%)	9(3,6%)	0(0%)	0(0%)	0(0%)
	Post therapy (%)	0(0%)	0(0%)	0(0%)	0(0%)

Table 5 shows the distribution of CRS patients based on their nasoendoscopy scores. In the assessment of the Mucosal Edema score, 132 (52.4%) cases of patients had mild edema, while 117 (46.4%) cases of patients had severe mucosal edema. Only about 3 (1.2%) cases did not have mucosal edema. In the assessment of the secretion score, there were 193 (76.6%) cases of patients with clear and watery secretions,

30 (11.9%) cases of patients with no secretions and 29 (11.5%) cases of purulent and thick secretions. From the total nasoendoscopy score, it was found that all 252 (100%) cases were cases of chronic rhinosinusitis with a total nasoendoscopy score of more than 1.

Table 5. Nasoendoscopy score of CRS patients

	Characteristics	Total	%
I.	**Mucosal Edema Score:**		
	1. No edema	3	1,2
	2. Mild edema	132	52,4
	3. Severe edema	117	46,4
II.	**Secretion score:**		
	1. No secretion	30	11,9
	2. Clear and watery secretions	193	76,6
	3. Purulent and thick secretions	29	11,5
III.	**Nasoendoscopy total score**		
	1. ≥1	252	100
	2. <1	0	0

Discussion

This study enrolled 252 patients diagnosed with chronic rhinosinusitis (CRS) meeting the specified inclusion and exclusion criteria. The majority of CRS cases were observed among individuals in the productive age group. The average age of the patients included in this study was 37.51 ± 17.39 years, with the highest number of individuals (56 or 22.2%) falling within the 20-29-year age bracket. These findings align with the European Position Paper on Rhinosinusitis and Nasal Polyps (EPOS) 2020, which indicates an increasing prevalence of CRS with age, specifically a rise of 2.7% in the 20-29-year age group and 6.6% in the 50-59-year age group. However, the prevalence of CRS decreases to 4.7% after the age of 60 years.[1]

CRS tends to be more prevalent among adults in their productive years due to their increased outdoor activity, which exposes them to allergens and pollutants. Additionally, changes in diet and lifestyle contribute to this occurrence. The findings of this study align with previous research conducted by Marlina et al., which also demonstrated an increasing incidence of CRS with advancing age, followed by a decline after the age of 60 years.

Among the study participants, there were 135 male patients (53.6%), which represented the highest proportion, while female patients numbered 117 (46.4%). These findings contrast with the information presented in EPOS 2020, which states that the prevalence of CRS is more commonly observed in women than men, with a ratio of 6:4.1. Similarly, data from the Rhinology-Allergy Division of ENT Head and Neck Surgery at Hasan Sadikin General Hospital recorded in 2014 consisted of 251 cases, with 115 males and 136 females. In 2015, out of 308 cases, women accounted for 52.3%. The prevalence of CRS increased by 16% in 2016, with a total of 322 cases, comprising 148 males and 174 females.[4,5] The higher prevalence of CRS in females may be attributed to their heightened concern for health, leading them to seek medical attention promptly. Furthermore, Fokkens et al. have proposed the hypothesis that hormonal factors, including estrogen, progesterone, and placental growth hormone, may exert an influence on the nasal mucosa and blood vessels. This hormonal influence has the potential to play a role in the pathogenesis and development of chronic rhinosinusitis (CRS). Estrogen, a hormone predominantly found in females but also present in males, has been associated with various physiological changes in the body, including vascular permeability and inflammation. It is believed that estrogen can modulate the nasal mucosa, leading to increased blood flow, vascular congestion, and nasal congestion, all of which are common symptoms of CRS. Progesterone, another hormone primarily found in females, has also been implicated in the regulation of the immune response and inflammatory processes. Studies have suggested that progesterone may contribute to the inflammation and swelling of the nasal mucosa in CRS.[1]

In a study conducted at H. Adam Malik Hospital in 2006, it was observed that CRS was more prevalent in males. The active role of tobacco smoke exposure in exacerbating CRS was identified, as it can induce mucosal changes and impair the function of cilia in the nasal passages and paranasal sinuses.[17] Nevertheless, the relatively small difference in patient numbers between genders in this study does not demonstrate a significant association between gender and the incidence of CRS.

Rhinosinusitis imposes a substantial burden on society in terms of healthcare utilization and decreased productivity.[1,3,4] Rhinosinusitis is a comorbidity frequently associated with allergic rhinitis, characterized by inflammation and blockage of the sinus ostium, which is mediated by IgE. The persistent inflammation can lead to obstruction of the sinus ostium, impairments in mucociliary clearance mechanisms, and accumulation of mucus. In addition to the aforementioned symptoms, nasal obstruction is another commonly experienced symptom in chronic rhinosinusitis (CRS). This obstruction occurs as a result of IgE-mediated degranulation of mast cells and basophils, triggering the release of inflammatory mediators. These mediators contribute to the inflammatory response within the nasal passages, leading to swelling and

blockage. Moreover, the pathophysiology of allergic chronic rhinosinusitis involves certain mediators that have been found to impact sleep patterns.[1]

Determining the CRS phenotype is an important step in determining the management of CRS patients either through medical therapy or surgical therapy for optimal results.[1]

CRS is a complex and diverse disease with various phenotypes and endotypes. Recent advancements in understanding the underlying pathogenesis of CRS have led to the development of effective biologic treatments for its management. One way to categorize CRS phenotypes is by dividing them into CRS with nasal polyps and CRS without nasal polyps. However, there are additional phenotypes of CRS that should be considered, such as fungal rhinosinusitis (including invasive and non-invasive subtypes), infectious rhinosinusitis, cystic fibrosis, CRS in children, and CRS associated with systemic diseases.

According to a study by Cho et al. in 2020, the current classification of CRS includes two main categories: CRS with nasal polyps and CRS without nasal polyps. Allergic fungal rhinosinusitis is considered a subtype of CRS with nasal polyps, characterized by the presence of nasal polyps and allergic reactions to fungi. Another subtype, known as eosinophilic mucin rhinosinusitis, is also categorized under CRS with nasal polyps. This phenotype is characterized by the presence of eosinophilic mucin in the nasal passages, without evidence of fungal hyphae. It is worth noting that eosinophilic mucin rhinosinusitis is more prevalent than allergic fungal rhinosinusitis. Additionally, there is a subset of CRS patients who have congenital immune defects, hypogammaglobulinemia, or cystic fibrosis, which overlaps between CRS with and without nasal polyps.

Identifying CRS phenotypes primarily relies on clinical evaluation. For instance, clinicians assess whether the patient has CRS with or without nasal polyps. If nasal polyps are present, they determine if the patient's respiratory symptoms worsen with nonsteroidal anti-inflammatory drugs. They also investigate if the CRS is infectious and if so, whether it is associated with an underlying medical condition or caused by fungal infection. Furthermore, some cases of CRS are linked to anatomical abnormalities or congenital diseases, such as immotile ciliary syndrome and cystic fibrosis.

Apart from phenotypic categorization, there is ongoing research exploring the concept of CRS endotypes, which are characterized by specific molecular or cellular markers. In the future, it may be possible to identify different CRS endotypes based on biomarkers, such as eosinophilic CRS versus non-eosinophilic CRS. This approach would provide a more precise and tailored understanding of the disease, facilitating targeted treatment strategies.[6,7]

Phenotypic differentiation CRS into CRS with and without nasal polyps is supported by the endotypic differentiation found in remodeling, including expression of TGF- protein and its receptor, expression of MMPs and TIMPs and finally collagen deposition. Whereas in CRS patients without polyps, TGF- protein and its receptor are overexpressed, resulting in upregulation of phosphor-Smad-positive cells and collagen deposition. However, the endotype associated with CRS without polyps appears to be expressed earlier in CRS patients with polyps.[11,12]

In this study nasal congestion is the most common chief complaint. This is similar to the results of a study conducted by Dewi PK et al where the highest chief complaints was nasal congestion (67.9%), Lubis et al in 2015 (74.2%) and Sitinjak case series study in 2016 (92.6%). [17]

In CRS, the predominant bacteria that can be found are S. aureus, coagulase negative staphylococci, anaerobic bacteria, and gram negative. In adult patients, the appearance of bacteria is generally polymicrobial, both gram-positive and gram-negative, aerobic, and anaerobic.[1,3]

Viral and bacterial infections cause an inflammatory response and produce inflammatory mediators, namely bradykinin, which play a role in the symptoms of infection, in addition, allergic reactions cause the release of histamine in the airway epithelium, resulting in inflammation. Bradykinin causes pain-related symptoms such as sore throat, and pain in the sinuses. Bradykinin can also irritate sensory nerve fibers, triggering sneezing, runny nose, and also acts as a vasodilator, causing nasal congestion. Histamine can cause nasal itching and irritate sensory nerve fibers resulting in sneezing, runny nose and can act as a vasodilator causing nasal congestion. The nasal veins are congested and decongested, which is influenced by the vasoconstrictor sympathetic nerves and causes an altered state of airflow (often called the nasal cycle).[4.15] In addition, the cause of nasal congestion can also be caused by deviated septum, nasal cavity polyps, turbinate hypertrophy, and the presence of tumors in the nose.[4.9]

The process in CRS is often associated with several conditions, especially with allergies that cause high levels of histamine which causes the process of chronicity. Histamine is not the main factor that causes nasal congestion, but is caused by other factors, namely cysleukotrienes (LTD4) and tomboxane A2 (TXA2). Research conducted by Marlina regarding pharmacotherapy in CRS patients, found a decrease in nasoendoscopy scores in all study subjects but there was no significant difference between the allergic and non-allergic groups.[3]

CRS without polyps is a variable persistent inflammatory disorder. The foremost remedy alternatives consist of intranasal corticosteroids and nasal irrigation, despite the fact that antibiotics can be utilized in treating acute exacerbations of CRS with out polyps. In addition, long-time period remedy of macrolides, that have antimicrobial in addition to anti inflammatory consequences are utilized by a few doctors. Oral corticosteroids are frequently now no longer endorsed for the remedy of CRS with out polyps until there may be a excessive suspicion that the disorder includes TH2-dominant inflammation. Patients who do now no longer reply to scientific remedy for CRS with out polyps frequently go through Endoscopic Sinus Surgery (ESS).[6]

CRS with nasal polyps is typically characterized as an eosinophilic-dominant TH2-associated disease. When it comes to managing CRS with polyps, there are several treatment options available that aim to alleviate symptoms and improve overall management. Intranasal corticosteroids play a crucial role in the management of CRS with polyps by reducing inflammation within the nasal passages. Commonly prescribed intranasal corticosteroids include mometasone, fluticasone, budesonide, and triamcinolone. These medications are typically administered as up to two sprays, twice daily, helping to control symptoms and improve nasal congestion.

Saline nasal irrigation is another beneficial treatment option for individuals dealing with CRS and nasal polyps. This technique involves rinsing the nasal passages with a saline solution, effectively reducing nasal congestion, clearing mucus, and promoting nasal hygiene. Saline irrigation can be performed using various devices, such as neti pots or nasal irrigators, and is often recommended as an adjunct therapy alongside other treatments.

In more severe cases where symptoms are unresponsive to other interventions, short-term oral corticosteroids may be prescribed. Oral corticosteroids possess potent anti-inflammatory properties and can provide rapid relief for individuals experiencing significant symptoms. However, due to their potential side effects, such as an increased risk of infections and metabolic changes, these medications are generally used for short durations under close medical supervision.

For individuals with CRS and nasal polyps who do not respond adequately to other treatment modalities, the utilization of

dupilumab, an anti-IL-4 receptor alpha monoclonal antibody, may be considered. Dupilumab has demonstrated promising results in reducing nasal polyps and addressing the underlying inflammation. It is typically reserved for severe cases and administered under the guidance of a healthcare professional[6]

In this study, all patients were treated with nasal irrigation and intranasal corticosteroids, while 158 (62.7%) cases were treated with amoxicillin and clavulanate.

Amoxicillin-clavulanate is one of the standard therapies which aims to minimize the risk of resistance and has the ability to eradicate bacteria by produce beta-lactamases. The bacteriolytic properties of amoxicillin clavulanate involve its ability to hinder the formation of bacterial cell walls. This interference specifically targets the cross-linking mechanism that normally occurs between the linear peptidoglycan polymer chains, which serve as the fundamental building blocks of bacterial cell walls. By inhibiting this cross-linking process, amoxicillin clavulanate disrupts the construction of intact bacterial cell walls.[3]

Several studies on antibiotics have found that amoxicillin-clavulanate acts on monocytes and nasal epithelial cells and can suppress bacterial LPS signals that cause osteitis. can ultimately inhibit AP-1. This indicates that amoxicillin clavulanate is effective in suppressing the production of IL-6 at the site of infection.

Marlina et al concluded that pharmacotherapy with nasal irrigation using 0.9% NaCl, intra-nasal corticosteroids and systemic antibiotic amoxicillin clavulanate for 14 days was proven to reduce the severity of CRS symptoms. In this study also found improvements in quality of life, and decreased levels of IL-6 in nasal secretions of patients with CRS.[3]

According to Lund, administration of the drug improved outcomes for CRS patients, with nasal irrigation with 0.9% NaCl, intranasal corticosteroids, and oral amoxicillin clavulanate leading to a reduction in the severity of symptoms in CRS patients, increasing productivity. and performance will improve..[15] Currently, there are still pros and cons to the use of antibiotics in CRS in several journals.[3,4]

One form of drug therapy is nasal irrigation. Physiological 0.9% NaCl was administered in this study. Nasal wash administration prevents and eliminates major pro-inflammatory mediators of CRS. Chronic inflammatory processes can be suppressed by administering intranasal corticosteroids. Inhibits the release of pro-inflammatory cytokines and chemokines such as IL-6. T cells are sensitive to corticosteroids and decline with corticosteroid dose and appropriate timing.[3,4]

Binding factors or high affinity for steroid receptors should be considered when using intranasal corticosteroids. Corticosteroids inhibit the release of vasoactive mediators, thereby reducing vasodilation, fluid extravasation, mediator deposition, and recruitment of inflammatory cells to fibroblast proliferation processes and extracellular protein matrix synthesis. enhances the inflammatory response by reducing 3 Polypoid and polypoid chronic sinusitis are chronic sinuses. Chronic sinusitis is a condition characterized by persistent inflammation of the nasal and sinus mucosa. When it comes to chronic sinusitis without polyps, there is a more prominent presence of Th1 cells, leading to higher levels of IFN-γ and concentrations of transforming growth factor B1 (TGF-β1). On the other hand, chronic sinusitis with polyps is primarily associated with Th2 cells, resulting in eosinophilic inflammation and elevated levels of IL-5 and IgE. It's worth noting that helper cells, known as CD4 cells, have the ability to produce different types of cytokines. Th1 cells produce cytokines such as IFN-γ and IL-2, while Th2 cells secrete cytokines like IL-3, IL-4, IL-5, IL-13, and GM-CSF.[1,3,12]

The most frequent cause of COM (chronic otitis media) obstruction is the most common cause, but there are various other factors that can contribute to its development. These include infections, allergic rhinitis, smoking, exposure to indoor or outdoor pollutants, as well as certain granulomatous diseases like sarcoidosis and Wegener's granulomatosis. Additionally, ciliary dyskinesia and cystic fibrosis are among the other potential mechanisms that can lead to COM obstruction. It's important to recognize that there are multiple pathways and conditions that can contribute to the occurrence of COM.[3] A study by Hulse et al. stated that low pH and exposure of Helicobacter his pylori in laryngopharyngeal reflux disease (LPR) to the sinus mucosa showed damaging effects on the mucosal layer. However, this is still debatable.[9]

Another defense against the inflammation that occurs in CRS is the use of various antibacterial products that help the host fight off pathogenic bacteria. is the presence of sinus mucosa, including; . If the mucociliary condition is poor, secretions accumulate in the sinonasal mucosal area, leading to excessive bacterial colonization and development of bacterial rhinosinusitis.[10]

Other factors associated with CRS include decreased ciliary function, allergies, asthma, aspirin sensitivity, immune system dysfunction, genetic factors, pregnancy and endocrine status, local host factors, biofilms, environmental factors, medical Includes protogenic factors, Helicobacter pylori and LPR, and osteitis. This condition promotes the accumulation of bacteria. Staphylococci were the most common type of bacteria found.[1,10,14] Staphylococci are bacteria that can produce biofilms and cause superantigen states.[10]

In addition, in CRS there is involvement of the sinus bones in the inflammatory process. There are two main phenotypes of osteitis, namely the allergic group with upper respiratory tract allergies and the CRS group without upper airway allergy.[14]

Assessment of symptom severity using a visual analogue scale (VAS) and nasal endoscopy score. The VAS generated from this study complained of varying degrees of four CRS symptoms: stuffy nose, rhinorrhea, facial pain and odor disturbance. The most frequent occurrence on her VAS overall was nasal congestion. Overall his VAS analysis in this study concluded that he had a significant difference in VAS scores between pretreatment and posttreatment conditions..

After therapy, there was a decrease in the score of all VAS symptoms. Study by Marlina L et al. showed that nasal congestion was the most common complaint and the highest score decreased in VAS and Nasoendoscopy scores.[3] Nasal obstruction decreases the diameter of the nasal cavity, increases airway resistance to airflow in the nose and causes nasal obstruction. Complaints of nasal congestion is often worse at night, and early morning.[3]

Evaluation of edema and nasal mucus secretion can serve as valuable tools in evaluating the efficacy of treatment. All study participants showed significant reductions in total nasoendoscopy scores and improved results. Analyzes showed that there was a significant difference in pre- and post-treatment status, and a decrease in nasal endoscopy scores was observed in all study participants. However, no significant difference was observed between allergic and non-allergic groups. In summary, the results of this study highlight the efficacy of treatment in reducing nasal endoscopy scores, although no significant differences were found between allergic and non-allergic subjects.[3]

In this study, most of mucosal Edema score assessment had mild edema. In the assessment of the secretion score, there were 193 (76.6%) cases with clear and watery secretions. All cases were CRS with a total nasoendoscopy score of more than equal to 1.

Mucosal edema and secretions in various conditions can be attributed to the presence of neurogenic inflammatory processes. Neurogenic processes arise as a result of neural reflexes triggered by inflammatory stimulation. It is important to note that reflexes related to inflammation may not always involve the central nervous system. Certain organs, including the skin, nasal mucosa,

and lower respiratory tract, exhibit neurogenic inflammation. The nasal mucosa contains C afferent nerve fibers (C-fibers) that have the ability to directly modulate the surrounding mucosal tissue without the need for central nervous system involvement or efferent autonomic nerves. Neuropeptides released from the terminal nerve endings play a role in vasodilation, edema formation, smooth muscle contraction and relaxation, and recruitment and activation of inflammatory cells. Symptoms associated with neurogenic inflammation include rhinorrhea, nasal congestion, and itching of the nose. It is worth noting that while vascular processes can contribute to a runny nose, they only account for approximately 10% of cases..[3,4,14]

In summary, chronic sinusitis (CRS) primarily affects people of working age, with incidence decreasing after age 60. Outpatients at Hasan Sadikin General Hospital in Bandung had the highest number of male patients. Nasal congestion was found to be the major chief complaint in patients with CRS. CRS without nasal polyps was found to be the most common subtype. All participants received nasal washes and intranasal corticosteroids, and antibiotic therapy was prescribed in 62.7% of cases. Before treatment, the severity of symptoms such as nasal congestion, rhinorrhea, facial pain, and olfactory disturbance were generally rated as mild based on Visual Analogue Scale (VAS) scores. In addition, all subjects had nasal endoscopy scores greater than 1, indicating a diagnosis of chronic rhinosinusitis.

Based on the results of this study, the use of pharmacotherapy, particularly nasal irrigation, intranasal corticosteroids and clavulanate amoxicillin, is recommended for the treatment of chronic sinusitis (CRS) without nasal polyps in routine clinical practice. recommended to promote. In addition, further studies are needed to explore the relationship between patient characteristics and CRS severity using visual analogue scales (VAS) and nasal endoscopy scores. Furthermore, future studies should focus on evaluating the impact of amoxicillin clavulanate antibiotic therapy on the efficacy of CRS treatment.

Conclusion

Chronic sinusitis primarily affects people of working age, with a higher prevalence observed in men. Nasal congestion was the main complaint reported by patients with chronic sinusitis in this study. The most frequently identified subtype in this study was chronic sinusitis without nasal polyps. All study participants received medical therapy consisting of nasal washes and intranasal corticosteroids, and 158 received antibiotic therapy. Initial assessment of symptom severity using the SAV score revealed mild symptoms in all subjects. In addition, all participants had nasal endoscopy scores greater than 1, confirming the diagnosis of chronic sinusitis.

References

1. Fokkens WJ. EPOS 2020: European Position Paper on Rhinosinusitis and Nasal Polyps 2020. Executive summary of EPOS 2020 including integrated care pathways. Rhinology. 2020. 58 (2): 82-111.
2. Ratunanda SS. Refluks Helicobacter pylori di mukosa hidung penderita rinosinusitis kronik disertai refluks laringofaring. ORLI. 2018; 48 (2): 148-58.
3. Marlina L. Impact of Pharmacotherapy to decrease Interleukin-6 in patients with chronic rhinosinusitis without nasal polyp. ORLI. 2020; 50 (1): 30-7.
4. Kusmardiani D. Effectiveness of Amoxycillin-Clavulanate Acid on the Symptomps of Chronic Rhinosinusitis without Nasal Polyp patients in Hasan Sadikin Hospital. Thesis. Bandung: Faculty of Medicine Padjadjaran University; 2018.1-3.
5. Lasminingrum L. Hubungan Pembentukan Biofilm Bakteri *Staphylococcus Aureus* dan *Pseudomonas Aeruginosa* Dengan Derajat Penyakit dan Kualitas Hidup Penderita Rhinosinusitis Kronik. JSK. 2019; 4 (3): 117-24.
6. Cho SH. Phenotypes of Chronic Rhinosinusitis. J Allergy Clin Immunol Pract. 2020; 8(5):1505-11.
7. Staudatcher AG. Use of endotypes, phenotypes and inflammatory markers to guide treatment decisions in chronic rhinosinusitis. Ann Allergy Asthma Immunol. 2020; 124: 318-25.
8. Cho SH. Chronic Rhinosinusitis Phenotypes: An Approach to Better Medical Care for Chronic Rhinosinusitis. 2016; J Allergy Clin Immunol Pract 4(4): 639-42.
9. Hulse KE. Immune Mechanisms of Chronic Rhinosinusitis. Current Allergy And Asthma Reports. 2016; 16(1):1-8.
10. Stevens WW, Lee RJ, Schleimer RP, Cohen NA. Chronic Rhinosinusitis Pathogenesis. J Allergy Clin Immunol. 2015; 136(6): 1442-53.
11. Akdis CA. Endotypes and Phenotypes of Chronic Rhinosinusitis: A PRACTALL document of the European Academy of Allergy and Clinical Immunology and the American Academy of Allergy, Asthma & Immunology. J Allergy Clin Immunol. 2013;131(6): 1479-1490.
12. Bachert C. Phenotypes and Emerging Endotypes of Chronic Rhinosinusitis. J Allergy Clin Immunol Pract. 2016; 4(4): 621-628.
13. Eiwegger T. Cytokine Profile in Chronic Rhinosinusitis. Dalam: Akdis CA HP, AgacheI,editor. Global Atlas of Allergic Rhinitis and Chronic Rhinosinusitis. Europe: European Academy of Allergy abd Clinical Immunology; 2015.300-1.
14. Lam K. The etiology and Phatogenesis of Chronic Rhinosinusitis: A Review of Current Hypothesis. Current Allergy and Asthma Reports. 2015; 15(7):1-10.
15. Lund VJ. Maximal Medical Therapy for Chronic Rhinosinusitis. Otolaryngologic Clinics of North America. 2005; 38 (6): 1301-10.
16. Munir D. The Clinical Features of Ostiomeatal Complex in Chronic Maxilarry Sinusitis by Nasoendoscopic Examination. Majalah Kedokteran Nusantara. 2016; 39:12-5.
17. Dewi PK. Karakteristik Penderita Rinosinusitis Kronis Yang Rawat Jalan di Poli THT-KL RSUP Sanglah Denpasar Tahun 2016. E-Jurnal Medika 2018; 7 (12):1-12.