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Prevalence of Chronic Rhinosinusitis in ENT Departement RSUP Dr. Mohammad Hoesin Palembang

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Abstract

Introduction: Prevalence of Chronic Rhinosinusitis in ENT Department RSUP Dr. Mohammad Hoesin Palembang Period 2016-2018. Chronic rhinosinusitis (CRS) is an inflammation involving the nose and paranasal sinuses where the patient has two or more major symptoms or one major symptom with two minor symptoms for ≥12 weeks. The prevalence of CRS throughout the world population is around 10-12%. The prevalence of CRS in Indonesia is uncertain. A research has been conducted on the prevalence of CRS in RSUP Dr. Mohammad Hoesin Palembang in 2015, therefore this study aims to find out more about the prevalence of CRS in the ENT Department of Dr. Mohammad Hoesin Palembang General Hospital in the period 2016-2018 and its distribution based on age, sex, major symptoms, minor symptoms, and the number of sinuses involved.

Methods: This research was an observational descriptive survey with cross-sectional design. This study used medical records of CRS patients undergoing surgery in the Rhinology Division of the ENT Department RSUP Dr. Mohammad Hoesin Palembang period 2016-2018. Sampling was done by consecutive sampling method. The amount of samples in this research is 99 cases. The result of this research is presented in table and narration form. The prevalence of CRS was 33.55%. CRS is most commonly found by the age group 46-53 years (21.2%), male sex (65.7%) with a ratio between men and women 1.9: 1. The most common major symptom was nasal congestion (100%) and the most common minor symptom was headache (62.6%). The most number of sinuses involved based on the paranasal sinus CT scan results was multiple sinusitis (52.5%).

Keywords: Prevalence, Chronic Rhinosinusitis, CRS

Introduction

Rhinosinusitis is an inflammatory condition involving the nose and paranasal sinuses. Based on its duration, rhinosinusitis is divided into acute and chronic. Rhinosinusitis is called chronic if it occurs for 12 weeks or more[1]. Chronic rhinosinusitis (CRS) is a global health problem because it has a major effect on the sufferers' quality of life such as in work, education, and daily activities.

CRS can occur in men and women and at all ages. However, CRS is more common in men than women and more common in middle age (35-64 years). The mean age of patients diagnosed with CRS is 48.4 years[2]. The prevalence of chronic rhinosinusitis in the entire world population is around 10-12%, the majority of sufferers experience moderate to severe symptoms[3]. In the United States, 146 out of 1000 populations experience chronic rhinosinusitis[4]. In Europe, CRS prevalence reaches 11%. In Asian countries such as China and South Korea the prevalence of chronic rhinosinusitis is around 7-8%. It is not yet known why CRS incidence is increasing every year worldwide[5]. The prevalence of CRS in Indonesia is uncertain. According to Indonesia's Department of Health in 2003, CRS ranked 25th from 50 major diseases or approximately 102.817 patients admitted to the hospital[6]. According to Soetjipto in Multazar, from 435 patients in Rhinology Division ENT Department RSCM from the period January to August 69% (300 patients) were suffering from chronic rhinosinusitis[7].

Chronic rhinosinusitis is divided into CRS with nasal polyps and CRS without nasal polyps[1]. Nasal polyps are benign masses in the nasal mucosa, most commonly found in osteo-meatal complexes in the meatus media and ethmoid sinus[8]. Nasal polyps are soft in consistency and contain a lot of liquid, are round or oval in shape, and semi translucent or grayish white in color. In chronic rhinosinusitis nasal polyps are usually multiple and bilateral[9].

The etiopathogenesis of chronic rhinosinusitis is still uncertain and is suspected to be multifactorial. Fungal and bacterial infections are thought to be the most important factors in the chronic inflammatory process in the nasal mucosa. Other factors that are thought to cause CRS include genetic and anatomical disorders, mucocillary disorders, and conditions such as asthma and aspirin inntolerance[1]. These factors damage the nasal mucosal defense system that disrupts the clearance of allergens, microbes, mucus, or foreign particulates from the air entering the nose. The accumulation of immune cells including eosinophils, basophils, neutrophils, mast cells, T cells, and B cells triggers an inflammatory response that produces inflammatory mediators. These inflammatory mediators cause destruction of the respiratory

epithelium, disrupt the mucocillary system, and expand the area of infection. These processes trigger the clinical symptoms of CRS such as rhinorrhea, a sense of pressure on the face, and other symptoms. In some CRS cases chronic inflammatory processes can cause edema in the nasal mucosa to form polyps. According to the 1996 AAO-HNS Task Force, patients were diagnosed with CRS if they had two or more major symptoms or one major symptom with two minor symptoms for ≥12 weeks. Major clinical symptoms include pain or pressure on the face, nasal congestion, mucopurulent rhinorrhea either anteriorly, posteriorly, or both, and hyposmia/anosmia. Minor clinical symptoms include headache, fever, halitosis, pain in the dental area, cough, and pain or pressure on the ear. The diagnosis of CRS is made through history taking, physical examination and other supporting examinations[9]. When CRS patient is examined with anterior rhinoscopy there can be signs of inflammation such as hyperemic mucosa, swelling and mucopurulent secretions in the nasal cavity. If the CRS type is CRS with nasal polyps a pale mass that is easily moved on both sides of the nose (bilateral) can be found. In nasoendoscopy mucosal inflammation, concha hypertrophy, mucopurulent secretion, and other disorders such as polyps and septal deviation can be found. Other tests that can be performed for diagnosis are radiological examinations such as CT scans, laboratory examinations, and mucociliary function and respiratory function examination[1,9,10]. The prevalence of chronic rhinosinusitis in Indonesia is still uncertain and is expected to increase every year. Patients with chronic rhinosinusitis have differences in the frequency distribution of age, sex, major symptoms, minor symptoms, and the number of sinuses involved. A research has been conducted on the prevalence of CRS in RSUP Dr. Mohammad Hoesin Palembang in 2015[11], however there are no recent data regarding the prevalence of chronic rhinosinusitis in the ENT Department RSUP Dr. Mohammad Hoesin Palembang. Therefore further research was carried out on the prevalence of chronic rhinosinusitis in the ENT Department RSUP Dr. Mohammad Hoesin Palembang for the period of 2016-2018.

Methods

This research was a descriptive observational survey with cross sectional design. This research was conducted from July to December 2019 at the ENT Department of RSUP Dr. Mohammad Hoesin Palembang. This research used secondary data in the form of medical records of patients undergoing surgery in the Rhinology Division of ENT Department of RSUP Dr. Mohammad Hoesin Palembang in the period of 2016-2018 that met the inclusion criteria. Sampling was done by consecutive sampling method. Secondary data obtained in this study were collected and then processed and analyzed descriptively (univariate) using a computer

application program in accordance with the variables studied. The results of the study are presented in tabular form and explained in narrative form.

Results

From the medical record data, there were 295 patients undergoing surgery in the Rhinology Division of ENT RSUP Dr. Mohammad Hoesin Palembang in the period of 2016-2018. Of the 295 patients, 130 of them were diagnosed with chronic rhinosinusitis, but the data that met the inclusion criteria were 99 cases. Therefore, the prevalence of chronic rhinosinusitis in the ENT Department of RSUP Dr. Mohammad Hoesin Palembang for the period of 2016-2018 was 33.55%.

Table 1 shows the distribution of chronic rhinosinusitis patients by age. Eight age groups were determined using the Sturgess formula, namely 6-13, 14-21, 22-29, 30-37, 38-45, 46-53, 54-61, and 62-69 years. Of the 99 subjects studied, the average age of chronic rhinosinusitis patients in this study was 37.10 years. Chronic rhinosinusitis was most prevalent in the age group of 46-53 years which is 21 cases (21.2%), and least prevalent in the age group of 6-13 years which is only 2 cases or 2% of the total sample.

Table 1. Distribution of Chronic Rhinosinusitis Patients According to Age

Age (Years Old)	n	%
6-13	2	2.0
14-21	16	16.2
22-29	13	13.1
30-37	17	17.2
38-45	19	19.2
46-53	21	21.2
54-61	4	4.0
62-69	7	7.1
Total	**99**	**100**

Table 2 shows the distribution of chronic rhinosinusitis patients in RSUP Dr. Mohammad Hoesin Palembang according to gender. From 99 CRS patients, 65 of them were male (65.7%) and 34 patients were female (34.3%). The ratio between male and female patients in this study is 1.9:1.

Table 2. Distribution of Chronic Rhinosinusitis Patients According to Gender

Gender	N	%
Male	65	65.7
Female	34	34.3
Total	**99**	**100**

Table 3 shows the distribution of chronic rhinosinusitis patients in RSUP Dr. Mohammad Hoesin Palembang according to major symptoms. According to 1996 AAO-HNS Task Force, major symptoms of CRS include pain or pressure on the face, nasal congestion, mucopurulent rhinorrhea either anteriorly, posteriorly, or both, and hyposmia/anosmia. Of the 99 subjects studied, all of them suffer major clinical symptoms in the form of nasal congestion (100%). Mucopurulent rhinorrhea either anteriorly, posteriorly, or both, were found in 97 cases (98%), pain or a sense of pressure on the face were found in 58 cases (58.6%) and hyposmia/anosmia were found in 55 cases (55.6%).

Table 3. Distribution of Chronic Rhinosinusitis Patients According to Major Symptoms

Minor Symptoms	f	N	%
Pain or pressure on the face	58	99	58.6
Nasal congestion	99	99	100
Mucopurulent rhinorrhea	96	99	97
Gangguan penghidu	55	99	55.6

Table 4 shows the distribution of chronic rhinosinusitis patients in RSUP Dr. Mohammad Hoesin Palembang according to minor symptoms. According to 1996 AAO-HNS Task Force, minor symptoms of CRS include headache, fever, halitosis, pain in the dental area, cough, and pain or pressure on the ear. Of the 99 subjects studied, the most common minor symptom was headache. Headache was found in 62 cases (62.6%), minor symptoms in the form of cough were found in 5 cases (5.1%), dental pain were found in 3 cases (3%), pain or pressure in the ear area and halitosis were found in 1 case (1%) each, and there were no patients with minor symptoms of fever in this study.

Table 4. Distribution of Chronic Rhinosinusitis Patients According to Minor Symptoms

Minor Symptoms	f	N	%
Headache	62	99	62.6
Fever	0	99	0
Halitosis	1	99	1
Dental pain	3	99	3
Cough	5	99	5.1
Ear pressure/fullness	1	99	1

Table 5 shows the distribution of CRS patients based on the number of sinuses involved. The number of sinuses involved is determined based on the results of paranasal sinus CT scan. Of the 99 subjects studied, the most paranasal sinus CT scan results were multiple sinusitis in 52 cases (52.5%), single sinusitis was found in 27 cases (27.3%) and pansinusitis in 20 cases (20.2%).

Table 5. Distribution of CRS Patients Based on The Number of Sinuses Involved

Number of Sinuses Involved	N	%
Single sinusitis	27	27.3
Multiple sinusitis	52	52.5
Pansinusitis	20	20.2
Total	**99**	**100**

Discussion

In this research, the prevalence of chronic rhinosinusitis in the ENT Department RSUP Dr. Mohammad Hoesin Palembang for the period of 2016-2018 was 33.55%. This shows that the number of CRS patients that underwent surgery in the Rhinology Division of the ENT Department RSUP Dr. Mohammad Hoesin Palembang is quite a lot. The prevalence of chronic rhinosinusitis in the entire world population is around 10-12%[3]. According to a research from Soetjipto in Multazar, from 435 patients in Rhinology Division ENT Department RSCM from the period January to August 69% (300 patients) were suffering from chronic rhinosinusitis[7]. In the study conducted by Amelia[11], from the medical records of CRS patients treated in the ENT Department of RSUP Dr. Mohammad Hoesin Palembang for the period of January 1st

2015 to December 31th 2015, there were 140 cases of CRS patients, but there were 73 patients who met the inclusion criteria.

In this study, chronic rhinosinusitis was most commonly found in the age group of 46-53 years, which is 21 cases (21.2%), and the second was 38-45 years age group which is 19 cases (19.2%). The results of this study are in line with several studies such as those conducted by Dewi, Yama et al., Amelia, and research by Trihastuti H. and Budiman B.J. [6,11,12]. CRS prevalence increases with age, especially after the age of 40 years and decreases at age 60 years and above[1]. In the productive adult age group, the mucociliary clearance function and the protective function of the epithelium decreases, causing a decrease in moisture production and mucus secretion. Inflammatory mediators associated with activation of the immune system in acute and chronic inflammation such as IL-1b, IL-6, IL-8, and TNF-a are also more common than those at a younger age. In addition, patients in the productive age group work more or do more activities outside than at home so they are more often exposed to air pollution, dust, and cold and dry air. These factors play a role in the pathogenesis of chronic rhinosinusitis and increase the risk of developing chronic rhinosinusitis especially in middle age[13,14].

According to gender, in this study male CRS patients are more prevalent than female with the ratio between male and female patients is 1.9: 1. There were 65 male patients (65.7%), compared to 34 female patients (34.3%). The results of this study are in line with research conducted by Kurniasih, C., and Ratnawati, L.M., Nurmalasari and Nuryanti, and Dewi, E. et al. where males suffers from chronic rhinosinusitis more than females[15–17]. Men suffers CRS more than women possibly due to different activities between men and women, where men are more often outside the home and smoke more than women. Smoking and environmental factors such as pollution, dust, and cold and dry air can cause changes in the mucocilirary system thereby inducing physiological nasal responses such as increased airway resistance, nasal irritation, nasal congestion, and rhinorrhea. This increases the risk for someone, especially men, to experience inflammation and chronic upper respiratory diseases such as chronic rhinosinusitis.

A person can be diagnosed with CRS if they have two or more major symptoms or one major symptom with two minor symptoms for ≥12 weeks. Of 99 patients with chronic rhinosinusitis it was found that all had major clinical symptoms in the form of nasal congestion. The results of this study are in line with research by Kurniasih, C., and Ratnawati, L.M., Sitinjak, and Dewi, E. et al. which shows that in patients with chronic rhinosinusitis the most common symptom of CRS is nasal congestion[15,17,18]. Nasal congestion, which can be described

as reduced nasal air flow or fullness in the face, involves a number of underlying mechanisms including inflammation of the nasal mucosa and paranasal sinuses that are associated with increasing the release of inflammatory mediators that induce vasodilation, increasing blood flow and increasing permeability of blood vessels. The result is swollen nasal sinusoidal veins, swollen anterior and inferior turbinate, and obstruction of nasal air flow which ultimately contributes to nasal congestion[19].

In this study the most common minor clinical symptoms were headaches which is found in 62 cases (62.6%), and in this study no patients with fever were found. The results of this study are in line with the research conducted by Kurniasih, C., and Ratnawati, L.M., Dewi, Yama et al., And Amelia which showed that the most common minor symptoms were headaches[6,11,15]. Minor symptoms such as headaches, fever, halitosis, pain in the tooth area, coughing, and pain or pressure in the ear are not typical symptoms of chronic rhinosinusitis. Headaches in CRS sufferers worsen with the worsening of CRS and worsen when pressure is applied to paranasal sinuses. The mechanism of headaches in CRS is not yet known for sure, though it is thought that headaches occur due to mucosal inflammation, turbinate hypertrophy, mucopurulent secretion, and other disorders such as edema, polyps and septal deviation that cause nasal congestion that trigger headaches[20].

In this study, the distribution of the number of sinuses involved was determined based on the results of a paranasal sinus CT scan. Of the 99 subjects studied, the most sinus involvement was multiple sinusitis which is found in 52 cases (52.5%), single sinusitis was found in 27 cases (27.3%) and pansinusitis in 20 cases (20.2%). The results of this study are not much different from the research conducted by Bubun et al. which states that multisinusitis is most prevalent in CRS patients[21]. This research is different from research conducted by Dewi, Yama et al. and Candra which states that the largest proportion of the sinus involvement was single rinosinusitis[6,22]. The difference in the sinus location and number of sinuses involved in CRS is due to the different drainage for each sinus. If only one paranasal sinus is involved in inflammation in chronic rhinosinusitis, it is called single sinusitis, if there is more than one it is called multiple sinusitis or multisinusitis and if it involves the entire paranasal sinus it is called pansinusitis. It is suspected that the more sinuses involved, the clinical symptoms will worsen[23].

Conclusion

The conlusion of this research is that in the period 2016-2018 the prevalence of chronic rhinosinusitis is 33.55%. Chronic rhinosinusitis is most prevalent in the age group of 46-53 years (21.2%), chronic rhinosinusitis is most commonly found in male patients (65.7%) with a ratio between male and female at 1.9:1, the major symptom most experienced by CRS patients in this study is nasal congestion with a percentage of 100%., the most common minor symptoms of CRS patients in this study were headaches with a percentage of 62.6%, and the most number of sinuses involved based on the paranasal sinus CT scan results is multiple sinusitis (52.5%).

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