

# Section 4

## Otorhinolaryngology

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### PREVALENCE OF NASAL POLYPS IN CHRONIC RHINOSINUSITIS PATIENTS UNDERGOING FUNCTIONAL ENDOSCOPIC SINUS SURGERY

Chronic Rhinosinusitis (CRS) is a common disease that affects a large percentage of the population, Nasal obstruction, nasal discharge, headache and the decline in quality of life are all symptoms that have social and economic consequences. CRS with nasal polyps is a common problem, it is a subgroup of CRS in which polyps in the middle meatus can be seen. It has a high social impact because of its chronic disease burden. Due to a large number of people with medically refractory rhinosinusitis, it is now widely accepted to use functional endoscopic sinus surgery (FESS) and the number of FESS procedures that are performed has increased. The study aimed to assess nasal polyps in chronic rhinosinusitis patients who underwent FESS. A retrospective study was conducted among patients aged between 18 and 86 years. The clinical records of patients who underwent functional endoscopic sinus surgery over the two years (2019-2020) were carefully reviewed and pertinent information was extracted from the database. Overall, 1671 patients underwent FESS, 1197 of them were for CRS. We found 165 (13.78%) patients with nasal polyps and 1032 (86.21%) of them were without nasal polyps. The study group's mean age was  $38.87 \pm 14.74$  years. The mean age of patients for CRS with nasal polyps and without nasal polyps was  $50.53 \pm 16.13$  and  $37 \pm 13.61$  years respectively, which was statically significant ( $\chi^2 = 216.303$ ;  $p < 0.001$ ). Most of the patients with nasal polyps (43%) were aged between 41-60 years. In the subgroup of CRS with nasal polyp females and males were 79 (47.88%) and 86 (52.12%) respectively. In our study, both CRS with nasal polyps and without nasal polyps showed significant age differences. In CRS with nasal polyp, males were more affected than females. More research is needed to assess demographic variables and outcomes of nasal polyps after FESS.

**Key words:** Chronic rhinosinusitis, FESS, Nasal polyp.

#### Introduction

Chronic rhinosinusitis (CRS) is a common disease that affects approximately 7%-30% of the population [1]. Nasal blockage, rhinorrhea, facial pain, headache, hyposmia, and a decline in the patient's standard of life are all symptoms that have social and economic consequences [2]. The link between functional endoscopic sinus surgery (FESS), sinusitis-related symptoms, and overall quality of life is still being researched [3]. CRS is one of the most common medical conditions in the United States of America, affecting about 12% of adults each year. Overall healthcare expenses are high, ranging from \$6.9 billion to \$9.9 billion

per year in 2014. Between 2006 and 2010, acute rhinosinusitis (ARS) and CRS accounted for more primary care visits with antibiotic prescriptions than any other condition [4].

CRS with nasal polyps (CRSwNP) is a subgroup of CRS in which polyps in the middle meatus can be seen. The exact cause of nasal polyp is unknown but maybe multifactorial. Polyps are linked to respiratory illnesses such as asthma and cystic fibrosis, as well as primary ciliary dyskinesia and aspirin sensitivity [5]. The drainage facilitation and elimination of the tissue obstructing the osteo-metal complex is known as functional endoscopic sinus surgery, and it is done while preserving the usual non-obstructing anatomy and mucous membrane [6].

FESS is commonly conducted in the United States due to a significant number of individuals with medically refractory rhinosinusitis, more than 500,000 procedures performed each year [7]. It is now widely accepted to use FESS [8], and the number of FESS procedures that are carried out has increased [9]. One of the more common procedures for treating chronic sinus diseases is functional endoscopic sinus surgery [10]. When traditional treatments fail to alleviate symptoms, FESS can be used. For these patients, FESS is an effective treatment modality and has been reported to provide both immediate and long-term symptom reduction and improve the quality of life in 85% of patients [7,11]. It is unknown how common nasal polyps are in the general population of patients receiving FESS. Aim of the study: To assess the prevalence of nasal polyps in chronic rhinosinusitis patients who underwent functional endoscopic sinus surgery.

## Material and Methods

### Study design

This retrospective study was conducted among patients aged 18-86 years.

### Data source

The clinical records of patients who underwent functional endoscopic sinus surgery were closely checked, and relevant data were collected from the Almaty Otolaryngology hospital database (MedElement). Every step of the study regarding human subjects during the study period was carried out in compliance with the institutional study committee's ethical guidelines. Due to the type of the study, informed consent was not required.

### Patient selection

Patients who underwent FESS at Almaty # 5 hospital's adult department between January 1, 2019, and December 31, 2020, were identified. During these two years, 1197 CRS patients underwent sinus surgery. Patients who had chronic rhinosinusitis at the time of admission were included. Patients under the age of 18, mucoceles and cysts of the sinuses, as well as those who were candidates for FESS other than CRS (sinus tumors, choanal atresia), were excluded. Patients with chronic rhinosinusitis who underwent sinus surgery were divided into two groups based on their clinical manifestations [12].

1. Group 1: CRSNP; chronic rhinosinusitis without polyp

2. Group 2: CRSwNP; chronic rhinosinusitis with nasal polyp

### Clinical examination and investigations

A detailed history, complete clinical examination, and diagnostic endoscopy were done. After an appropriate course of medical treatment for persistent rhinosinusitis and nasal polyposis, surgery was performed. All patients selected for surgery underwent a diagnostic endoscopic examination in the outpatient department for the nose, nasopharynx, with and without nasal decongestant. A preoperative CT scan was asked in all cases to identify the skeletal anatomy and the extent of the disease. Before surgery, the anatomic structures are typically examined in the coronal, axial, and sagittal planes. FESS was conducted in all cases by a single surgeon and an assistant or assistants, effectively following Stammberger's (ant-post) method used; The procedure involved uncinectomy, middle meatal antrostomy, anterior ethmoidectomy, and perforation of the ground lamella of the middle turbinate, as well as posterior ethmoidectomy, sphenoidectomy, and clearance of the frontal recess, depending on the extent of the disease. All cases were placed under general anesthesia and had oral intubation.

### Statistical analysis

Study data were entered in a Microsoft Excel sheet. Data were analyzed using the statistical package for social sciences (SPSS) 24. Study data related to demographics, history, outcome, surgeon, type of surgeries for related problems were analyzed. After exclusion criteria, data were categorized into two groups for endoscopic sinus procedures. All of the qualitative data was summed up using numbers and percentages. The Pearson Chi-square test ( $\chi^2$ ) was used to analyze the variations in proportions. Significant was defined as a P-value less than 0.05, and Non-Significant was defined as a P-value greater than 0.05 (P-value > 0.05).

## Result

Overall, 1671 patients underwent FESS, 1197 of them were for CRS. In this study, FESS for treatment of CRS was divided into two groups; CRSsNP and CRSwNP. 1032 (86.21%) patients were with CRS without nasal polyp and 165 (13.78%) had Nasal polyp. The overall mean age was  $38.87 \pm 14.74$  years. The mean age of groups was  $37 \pm 13.61$  and  $50.53 \pm 16.13$  years, respectively, which was statically significant ( $\chi^2=216.303$ ;  $p<0.001$ ).

Female and male were 561 (46.86%) and 636 (53.13%), respectively (table 1), but this was not statistically significant (p-value =0.799;  $\chi^2=0.078$ ).

The average days of hospital stay in group1 were 5.82±1.88 and, for group 2, that was 5.14±1.86. Hospital stay days were statistically significant between the groups ( $\chi^2=43.9133$ ; p-value=0.002).

**Table 1** – Patients’ general characteristics according to the type of chronic rhinosinusitis

N=1197 Group1 (CRSsNP) N=1032(86.21%)	Groups		Total p-value	Test of differences	
	$\chi^2$				
	Group2 (CRSwNP) N=165(13.78%)				
Age (Mean±SD)	37±13.61	50.53±16.13		216.303	<0.001
Sex N, (%)	Female	482(40.26)	79(6.59)	561(46.86)	0.078
	Male	550(45.94)	86(7.18)		
Hospital stay days (mean±SD)	5.82±1.88	5.14±1.86		43.9133	0.002

In the chronic rhinosinusitis group without nasal polyps, the majority of patients (66.66%) were between the ages of 18 and 40 (table 2), but in the nasal polyps group, the majority of patients (43%) were between the ages of 41 and 60. Between the groups, age was statistically significant ( $\chi^2= 129.38$  p-value < 0.001).

**Table 2** – Age categories of CRS without Polyp and CRS with polyp

N=1197 18-40		Age categories in years			Test of differences	
		41-60	>60	$\chi^2$	p-value	
Groups	CRSsNP, n (%)	688(66.66%)	270(26.16%)	74(7.17%)	129.38	<0.001
	CRSwNP, n(%)	43(26%)	71(43%)	51(30.9%)		
Total (CRS)		731(61.1%)	341(28.48%)	125(10.44%)		

In the CRSsNP group, the most common surgery was maxillary antrostomy combined with ethmoidectomy (42.92%). In the CRSwNP group, the most common surgery was ethmoidectomy (73.73%). Among the groups according to the type of surgery (table 3), there was a highly significant association ( $\chi^2=828.43$ ; P < 0.001).

**Table 3** – Type of sinus surgeries underwent for chronic rhinosinusitis

N=1197 M		The type of sinus operation										Total	Test of differences
		E	F	S	ME	MF	MEF	MES	EFS	Whole sinuses			
Groups	CRS sNP, n (%)	280 (27.1)	8 (0.77)	11 (1)	10 (0.96)	443 (42.92)	6 (0.5)	24 (2.3)	79 (6.59)	2 (0.19)	169 (16.37)	1032 (100)	$\chi^2=828.43$ P<0.001
	CRS wNP, n (%)	0 (0)	121 (73.73)	0 (0)	0 (0)	13 (7.87)	6 (3.63)	4 (2.42)	5 (3)	4 (2.42)	12 (7.27)	165 (100)	
Total(CRS), n %		280 (23.3)	129 (10.7)	11 (0.91)	10 (0.83)	456 (38)	12 (1)	28 (2.33)	84 (7.01)	6 (0.5)	181 (15.12)	1197 (100)	

M=maxillary anrostomy; E= ethmoidectomy; F= frontal sinusotomy; S= sphenoidectomy; ME= middle anrostomy with ethmoidectomy; MF= middle anrostomy with frontal sinusotomy; MEF= middle anrostomy and ethmoidectomy with frontal sinusotomy; MES= middle anrostomy and ethmoidectomy with sphenoidectomy; EFS= ethmoidectomy and frontal sinusotomy with sphenoidectomy.

## Discussion

Patients were aged between 18 to 86 years. The overall study group age was  $38.87 \pm 14.74$  years. CRS without nasal polyp was 1032 (86.21%) patients with a mean age of  $37 \pm 13.61$  and 165 (13.78%) patients with nasal polyp with a mean age of  $50.53 \pm 16.13$  years. In a study by Nair et al., (n= 90) patients aged group 16–71 years, with a mean age of 34.8 years CRS without nasal polyp included 38 patients with an average age of 31.2 years and a 9:10 male-to-female ratio. In CRS with nasal polyps, 52 patients were included, with a mean age of 37.5 years and a male-to-female ratio of 9:17 has been reported [13].

Females and males were 56 (46.86%) and 636 (53.13%) respectively. According to our findings, 165 (13.78%) of all patients with CRS had nasal polyps (CRSwNP). Nasal polyps affect 4 percent of the population, 7–15 percent of asthmatics, and up to 36–60 percent of Samter's triad patients

[14]. Nasal polyps are typical presentations in CRS patients and are thought to be linked to more serious types of disease with poor post-treatment outcomes. In the EPOS (European Position Paper on Rhinosinusitis and Nasal Polyps), a nasal polyp is classified as a subgroup of CRS [15]. Stevens et al. observed that 25%–30% of patients with chronic rhinosinusitis had CRSwNP [16].

In patients with chronic rhinosinusitis with nasal polyp, females and males were 79 (47.88%) and 86 (52.12%), respectively. Stevens and colleagues discovered in 2015 that females with CRSwNP had more severe disease than males undergoing sinus surgery at a tertiary care center [17]. Males were more than females affected, but no known genetic or environmental factors have been identified as being strongly linked to the development of this condition. Males were found to be more likely than females to have CRSwNP, according to Fokkens et al. [17]. Stevens and colleagues discovered in 2015 that females with CRSwNP had more severe

disease than males undergoing sinus surgery at a tertiary care center [18].

The mean age for patients with CRwNP was  $50.53 \pm 16.13$  years. According to Fokkens et al., CRSwNP is a middle-aged problem, with an average age of diagnosis of 40–60 years [18]. Presumptive nasal polyps in patients younger than

20 or older than 80 years pose concerns about other medical conditions. [16]. According to Juan et al., finding; (n=288) patients with chronic rhinosinusitis, there were 177 men and 111 women among the participants, ages ranged from 22 to 83 years, with an average age of  $52 \pm 14$  years [19]. Polyps were found in the majority of patients aged 40–60 years old, with a very small number in children and a very small number in those over 80 years old, according to Larsen and Tos. Males were more likely than females to have polyps in the 20-year-old classes, with a mean male: female ratio of 2.23. In the 40–50-year age group, the male: female ratio peaked at 2.9, and in the 80–89-year age group, it peaked at 6.0 [20].

The retrospective nature of this study had limitations, such as unrecorded confounding factors such as major and minor factors of CRS, revision surgery, and individual anatomical variations. Further research is needed to better understand the functional endoscopic sinus surgery outcome in chronic rhinosinusitis.

## Conclusion

In our study, both groups showed a significant age difference between chronic rhinosinusitis without polyps and with nasal polyps. In chronic rhinosinusitis with nasal polyp, males were more affected than females. According to a study of the literature, there was a wide variety of demographic data. More research is needed to assess demographic variables and outcomes following functional endoscopic sinus surgery.

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