

Role of Concha Bullosa in Etiopathogenesis of Chronic Rhinosinusitis: A Clinical Study

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ABSTRACT

Introduction: Chronic rhinosinusitis is diagnosed by surgeons mainly based on clinical presentation. Pneumatization of the middle turbinate is a common anatomical variant, usually referred to as a concha bullosa. There are studies in the literature suggesting that concha bullosa may have a role in sinusitis etiology. Aim of our study was to find the association of concha bullosa and chronic rhinosinusitis.

Material and Methods: Our study included 50 patients who were diagnosed to have chronic rhinosinusitis clinically [>2 major symptoms or 1 major symptom with >1 minor symptoms] after detailed history taking. Non-contrast (coronal and axial) CT scans were obtained for all patients. Patients of study group who underwent functional endoscopic sinus surgery for correction of anatomical variants were followed up for a minimum of 1 month and their improvement was assessed.

Results: Our study showed higher incidence of concha bullosa in the age group 21 to 30 years of age. There is a predominance of concha bullosa in Chronic Rhinosinusitis patients. The "p" value of $<.05$ signifies that the relation between Concha Bullosa and Chronic Rhinosinusitis is significant. Our study showed a statistically significant association between presence of concha bullosa and maxillary sinusitis with a p value of 0.00002.

Conclusion: The relation between Concha Bullosa and Chronic Rhinosinusitis is significant. In our study 35 patients had concha bullosa out of 50 patients of chronic rhinosinusitis.

Keywords: Concha Bullosa, Chronic Rhinosinusitis, Maxillary Sinusitis

INTRODUCTION

Rhinosinusitis refers to a group of diseases, mainly inflammatory and infectious, which affect the mucosa of paranasal sinuses. Factors involved include host and environmental such as allergens, air pollutants, viruses. Host factors include congenital conditions, hyperactive airway disease, Anatomic abnormalities and Systemic diseases. Pneumatization of the middle turbinate is a common anatomical variant, usually referred to as a concha bullosa. These variants could shift and compress the osteomeatal complex, obstructing the paranasal sinuses drainage pathway and causing chronic rhinosinusitis. There are studies in the literature suggesting that concha bullosa may have a role in sinusitis etiology. Even a nondiseased concha bullosa may cause critical obstruction in the presence of otherwise normally sized anterior ethmoid. We carried out a prospective study at our Department to document the incidence of concha bullosa and its correlation with pathogenesis of paranasal sinus inflammatory disease. The concha bullosa is a classic example of the potential of an anatomical variation to predispose to sinus disease. A concha bullosa by itself does not represent a disease state per se, but it predisposes the patient to develop rhinosinusitis more readily and more frequently. A 14%-53.6% frequency of concha

bullosa was reported by various studies.¹ concha bullosa may block area of middle meatus by mucosal contact.² It is a possible factor in recurrent sinusitis due to negative influence on sinus ventilation.³ Aim of our study was to find the association of concha bullosa and chronic rhinosinusitis and to study relation of concha bullosa and maxillary, ethmoid, frontal sinusitis.

MATERIAL AND METHODS

This prospective study was conducted at the Department of Otorhinolaryngology, G.G.S. Medical college, Faridkot. Total 50 patients were enrolled presenting to our OPD with chronic rhinosinusitis from Dec 2013 to Dec 2016. Well informed written consent was sought. A thorough clinical examination was done, all patients were investigated for routine hematological and serum investigations.

Nasal endoscopy and CT Scan (after a course of antibiotics and decongestants) were performed in all cases. It is recommended that either a CT scan or endoscopic evaluation of nose provides majority of objective data used to diagnose chronic rhinosinusitis.⁴⁻⁸

The inclusion criteria

1. Patients of age more than 10 years,
2. 12 weeks or more of signs and symptoms of chronic rhinosinusitis with 2 major factors or 1 major and >1 minor factors

The exclusion criteria

1. Patients with acute sinusitis
2. Patients with complications of sinusitis

The 1997 Task Force on Rhinosinusitis of the American Academy of Otolaryngology-Head and Neck Surgery recommended diagnosing rhinosinusitis based on major and minor criteria.

Major factors

Headache
Nasal obstruction
Nasal discharge
Post nasal drip
Smell disturbances

Minor factors

Fever
Halitosis

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Fatigue
Dental pain
Cough

Our study included 50 patients who were diagnosed to have chronic rhinosinusitis clinically [>2 major symptoms or 1major symptom with >1 minor symptoms] after detailed history taking. Non contrast (coronal and axial) CT scans were obtained for all patients. Patients of study group who underwent functional endoscopic sinus surgery for correction of anatomical variants were followed up for a minimum of 1 month and their improvement was assessed.

STATISTICAL ANALYSIS

The collected data were evaluated, analysed and the statistical tests used were mean and chi-square test at a 5% level of significance. The “p” value was calculated which denotes the probability that the difference between two samples occurred by chance. The “p” value less than 0.05 is considered to be statistically significant. This indicate that the difference occurred by chance has a probability of 5% or in other words, the examiner can be 95% sure that the difference is not by chance.

RESULTS

Out of 50 patients 22 were male and out of 22 male patients of CRS 12 (54.6%) had concha bullosa. remaining 28 were female and 15 (53.5%) female patients with CRS had concha. There is a predominance of concha bullosa in Chronic Rhinosinusitis patients. The “p” value of $<.05$ signifies that the relation between Concha Bullosa and Chronic Rhinosinusitis is significant.

Significant association was present between maxillary sinusitis and Concha bullosa.

DISCUSSION

Chronic rhinosinusitis is diagnosed by surgeons mainly based on clinical presentation. CT scan is considered as the gold standard investigation for evaluation of these patients.

In our study the incidence of concha bullosa among female patients was higher. A similar pattern was reported in several other studies.^{3,4}

Our study showed higher incidence of concha bullosa in the age group 21 to 30 years of age (table-1). Total 14 (40%) of 35 cases were in this age (table-1). The mean age of patients with concha bullosa was 33 years. In a study done by Hatice Gul Hatipoglu, Mehmet Ali cetin Enis Yuksel⁹ the mean age of patients was 30 years.

There is a predominance of concha bullosa in Chronic Rhinosinusitis patients in our study.

Stammberger¹⁰ et al state that pneumatization process apparently begins in middle age in some patients when there may be a renewed spurt of growth activity.

Our study showed a statistically significant association between presence of concha bullosa and maxillary sinusitis with a p value of $<.05$ (table-2).

Maru¹¹ et al showed an association between sinusitis and concha bullosa in his studies especially with pneumatization involving anterior end of middle turbinate.

Mohammad-Reda et al¹² in his study showed inflammatory disease of the sinuses in 71.7% patients with concha bullosa

and 57.7% patients without concha bullosa.

H. Halis Unlu et al¹³ in his study found that 38.1% had mucosal changes in maxillary sinus.

No significant association was noted between frontal sinusitis and concha bullosa (table-3). Our study showed a statistically non significant association between presence of concha bullosa and ethmoid sinusitis (table-4).

CONCLUSION

Pneumatization of the middle turbinate is a common anatomical variant, usually referred to as a concha bullosa. We have made an attempt to study the relationship of concha bullosa with chronic rhinosinusitis. Our study showed a statistically significant association between presence of concha bullosa and chronic rhinosinusitis.

Our study showed a statistically significant association between presence of concha bullosa and maxillary sinusitis, statistically

Age group in years	Patients with CRS and Concha	Patients with CRS and Without Concha	Total
11-20	4	2	6
21-30	14	6	20
31-40	12	6	18
41-50	3	1	4
51-60	2	0	2
>60	0	0	0
Total	35	15	50

Table-1: Age Distribution of study population

	Maxillary sinusitis present	Maxillary sinusitis absent	Total
Concha Present	33	2	35
Concha Absent	6	9	15
Total	39	11	50

Chi-square = 18.032, p value: 0.00002, Significant

Table-2: Association between Concha bullosa and maxillary sinusitis (on the same side as concha) in the study group

	Frontal sinusitis present	Frontal sinusitis absent	Total
Concha Present	20	15	35
Concha Absent	8	7	15
Total	28	22	50

Chi-square = .06, p value: 0.8, nonsignificant

Table-3: Association between Concha bullosa and frontal sinusitis in the study population

	Ethmoid sinusitis present	Ethmoid sinusitis absent	Total
Concha Present	11	24	35
Concha Absent	7	8	12
Total	18	32	50

Chi-square = 1.05, p value: 0.303, non significant

Table-4: Association between Concha bullosa and ethmoid sinusitis.

non significant association between presence of concha bullosa and ethmoid sinusitis and no significant association was noted between presence of concha bullosa with frontal sinusitis.

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