Prevalence of chronic rhinosinusitis at Muhimbili National Hospital, Dar es Salaam

Zephania Saitabau Abraham[a], Rafael Gabriel[b], Aveline Aloyce Kahinga[c], Daudi Ntunaguzi[c], Kassim Babu Mapondella[c] and Enica Richard Massawe[c]

a Department of Surgery, University of Dodoma-College of Health and Allied Sciences, Dodoma-Tanzania
b Department of Otorhinolaryngology-Mbeya Zonal Referral Hospital, Mbeya Tanzania
c Department of Otorhinolaryngology-Muhimbili University of Health and Allied Sciences, Dar es Salaam-Tanzania.

Correspondence:
Zephania Saitabau
zsaitabau@yahoo.com

Submitted: January 2019
Accepted: April 2019
Published: August 2019

Introduction: Chronic rhinosinusitis (CRS) affects people of all ages worldwide and has significant socio-economic impact. Data on chronic rhinosinusitis are scarce.

Objective: To determine the prevalence of CRS among patients attending the Otorhinolaryngology Department at Muhimbili National Hospital (MNH).

Method: This was a hospital based descriptive cross-sectional study where 56 patients with CRS were recruited from July to December 2015 after meeting the criteria set by American Academy of Otorhinolaryngology Head and Neck Surgery (AAO-HNS). Data were analysed using SPSS program version 21.

Results: The prevalence of CRS among 5321 patients was 1.07%; 51.8% were female and the highest proportion was aged 11-20 years. Bilaterality of disease was found in 62%. The maxillary sinus (83.9%) was the most affected sinus whilst the sphenoid sinus was least affected. There was good correlation between computerized tomography (CT) and intraoperative findings, anatomical variations and pathological features.

Conclusion: CRS appears to be less prevalent at MNH than elsewhere with a tendency to bilaterality and maxillary sinus predominance similar to other studies.

Keywords: Prevalence, chronic rhinosinusitis, Muhimbili Hospital, Tanzania

INTRODUCTION

Chronic rhinosinusitis (CRS) has a significant impact on the quality of life. The recurrent nature of the problem presents a clinical and economic challenge in developing countries.

A number of studies have been carried out to assess the prevalence of CRS. A survey in USA estimated that about 16% of the population was affected by CRS.[1] In a Sao Paulo (Brazil) study, CRS was found in 5.51%.[2,3] A Nigerian study found a prevalence of CRS of 7.3%.[4] In North-central Nigeria, a higher prevalence was reported at 24.7% similar to reports from Canada and USA[5-8] The maxillary sinuses have been reported in most studies as the sites predominantly affected by CRS.[8]

Data on this condition in sub-Saharan Africa are scarce and no study has been done in Tanzania.

METHOD

A hospital based descriptive cross sectional study, with the approval of the Research and Publication Committee of the Muhimbili University of Health and Allied Sciences, was conducted between July and December 2015. Participants were recruited on the basis of those who were found at the hospital. Those with CRS and underlying neoplasms were excluded to create comparability with other studies. Computerized tomography (CT) scan was obtained and the clinical diagnosis of CRS was made based on the presence of at least two major symptoms for at least twelve weeks consecutively as per the Task Force of American Academy of Otorhinolaryngology, Head and Neck Surgery (AAO-HNS).

Citation:
Abraham et al. Prevalence of chronic rhinosinusitis at Muhimbili National Hospital, Dar es Salaam. South Sudan Medical Journal 2019; 12(3):97-100

Table 1. Age and sex distribution of participants

Age group (years)	Sex		Total n(%)
	Males n (%)	Female n(%)	
≤10	937 (51.9)	870 (48.1)	1807 (34.0)
11-20	279 (48.7)	293 (51.3)	573 (10.8)
21-30	318 (40.1)	475 (59.9)	793 (14.9)
31-40	274 (42.2)	375 (57.8)	649 (12.2)
41-50	290 (46.5)	334 (53.5)	624 (11.7)
51-60	229 (43.1)	303 (56.9)	532 (10.0)
>60	170 (49.4)	174 (50.6)	344 (6.5)
Total	2497 (46.9)	2824 (53.1)	5321 (100)

Table 2. Proportion of patients with chronic rhinosinusitis by age

Age group (years)	Chronic rhinosinusitis		Total n(%)
	Yes n (%)	No n(%)	
≤10	1 (0.1)	1806 (99.9)	1807(34.0)
11-20	17 (3.0)	555 (97.0)	572 (10.7)
21-30	4 (0.5)	789 (99.5)	793(14.9)
31-40	10 (1.5)	639 (98.5)	649(12.2)
41-50	11 (1.8)	613 (98.2)	624(11.7)
51-60	7 (1.3)	525 (98.7)	532 (10.0)
>60	6 (1.7)	338 (98.2)	344 (6.5)
Total	56 (1.1)	5265(98.9)	5321 (100)

Table 3. Distribution of clinical features of chronic rhinosinusitis by sex

Clinical Presentation	Sex		Total
	Male	Female	
	n (%)	n (%)	n (%)
Nasal obstruction	27 (48.2%)	28 (50.9%)	55 (98.2%)
Nasal discharge	27 (48.2%)	27 (48.2%)	54 (96.4%)
Post nasal discharge	23 (41.1%)	28 (50.0%)	51 (92.1%)
Reduced smell sensation	24 (42.9%)	25 (44.6%)	49 (87.5%)
Facial pain	17 (30.4%)	22 (39.3%)	39 (69.6%)
Fatigue	15 (26.8%)	15 (26.8%)	30 (53.4%)
Halitosis	9 (16.1%)	9 (16.1%)	18 (32.2%)
Headache	9 (16.1%)	8 (14.3%)	17 (30.4%)
Dental pain	4 (7.1%)	5 (8.9%)	9 (16.1%)
Ear pain	2 (3.6%)	5 (8.9%)	7 (12.5%)

Nasal endoscopy was done on all 5321 patients and 56 had CRS. Pre-operative findings were compared with intra-operative findings during endoscopic or open surgery. Data were analyzed using SPSS version 21. The relationship between variables was established using Chi-square test and logistic linear regression. The level of agreement between scanning CT scanning and intra-operative findings was determined by calculating kappa statistics, sensitivity and specificity.

RESULTS

Demographic characteristics of study participants

This study involved 5321 patients: 2824 (53.1%) were females. The largest (34.0%) age group was ≤10 years while the smallest (6.5%) group was >60 years. The mean age was 25.5 years (Table 1).

The highest proportion (3.0%) of CRS was found in age group 11-20 years whilst the group ≤10 years had the lowest prevalence (0.06%) ($p < 0.0001$) (Table 2).

Proportions of chronic rhinosinusitis by sex ($p = 0.603$): Of the 56 patients with CRS 29 (51.8%) were female and 27 (48.2%) were male.

Clinical features of chronic rhinosinusitis by sex

The most common presenting symptom was nasal obstruction 55 (98.2%) whilst the least common was ear pain 7(12.5%) ($p< 0.05$) (Table 3).

Almost two-thirds of patients had bilaterality (62.5%). The right side was affected more often than the left (Table 4). There was almost an equal sex distribution of the side involved.

The maxillary sinus was the most commonly affected sinus group (83.9%) while the sphenoid sinus was the least involved group (30.4%) (Figure 1).

CT scan was very sensitive and specific in picking up concha bullosa, followed by septal deviation, and hypertrophied inferior turbinate with sensitivity 83.3% and 95.6 % respectively. Correlation Coefficient r= 0.95, t-test for significance coefficient is 8.390. (R2 =90.5%) (Table 5).

Among 32 patients with homogenous opacification, 16 had pus or mucus intraoperatively and 14 had polyposis.

DISCUSSION

CRS is a significant health problem with a rising prevalence worldwide (2-15%). Data for Tanzania are unknown. This study revealed the prevalence in patients attending our department to be 1.07 % similar to the study from Korea (1.1%) 10 although dissimilar to other community based studies with higher prevalences.[4,11,12]

Variability in age distribution of CRS was found similar to other studies.[6] Findings from this study demonstrated

Table 5. The comparison between pre-operative CT scan and intra-operative findings

Finding	FESS Positive			FESS Negative						
	CT + ve	CT – ve	n	CT + ve	CT - ve	n	Se	Sp	NPV	PPV
Mucosal thickening	8	10	18	4	22	26	44.4	84.6	68.7	66.6
Fungal balls	14	2	16	1	27	28	87.5	96.4	93.1	93.3
Septal Deviation	5	1	06	2	36	38	83.3	94.7	97.3	71.4
Hypertrophied Inferior Concha	22	1	23	1	20	21	95.6	95.2	95.2	95.7
Concha Bullosa	12	0	12	0	32	32	100	100	100	100
Blocked Osteomeatal complex	14	12	26	3	15	18	53.8	83.3	82.3	55.6

(Abbreviations for this table: Se: Sensitivity, Sp: Specificity, NPV: Negative predictive value, PPV: Positive predictive value, CT: Computerized tomography, FESS: Functional Endoscopic Sinus Surgery)

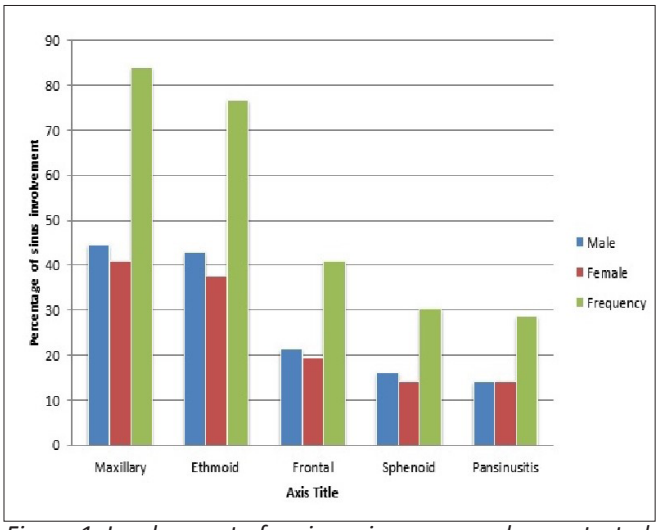

Figure 1. Involvement of various sinus groups demonstrated by CT scan by sex

the prevalence of CRS to be similar to other community based studies[13,14] though dissimilar to findings from western countries which were also community based .[1,5,6,15] The controversy may be due to differences in the perception of CRS-related symptoms and lifestyles in different settings.

The most common features were nasal obstruction in 55(98.2%), nasal discharge in 54(96.4%), post nasal discharge in 51(92.1%), reduced smell sensation 48(85.7%) similar to other studies [5,8,11,12]. Most patients had bilateral disease with the right side being more affected in unilateral disease. The maxillary sinus was most affected and the sphenoid sinus the least. Similar findings were reported in other studies.[4,5,8,11,12]

Perhaps an expected finding was that CT scans were sensitive in demonstrating the paranasal sinus pathologies with significant sensitivity and specificity similar to other studies.[8]

CONCLUSION

CRS has an overall prevalence of 1.1% in our setting being less than found elsewhere. The disease has a male preponderance and CT scanning has shown usefulness but added little to endoscopic evaluation. Thus the study has unveiled useful information on CRS in Tanzania.

Acknowledgements: We thank members of staff from our Department for their valuable inputs.

Competing interests: We declare we have no competing interests.

References

1. Pleis JR, Ward BW, Lucas JW. Summary health statistics for US adults: National Health Interview Survey, 2009. Vital and health statistics. Series 10, Data from the National Health Survey. 2010 Dec(249):1-207.
2. Pilan RR, Pinna FD, Bezerra TF, Mori RL, Padua FG, Bento RF, Perez-Novo C, Bachert C, Voegels RL. Prevalence of chronic rhinosinusitis in Sao Paulo. Rhinology. 2012 Jun;50(2):129-38.
3. Slavin RG, Spector SL, Bernstein IL, Kaliner MA, Kennedy DW et al; American Academy of Allergy, Asthma and Immunology; American College of Allergy, Asthma and Immunology; Joint Council of Allergy, Asthma and Immunology: The diagnosis and management of sinusitis: a practice parameter update. J Allergy ClinImmunol 2005, 116(6 Suppl):S13-S47.
4. Iseh KR, Makusidi M. Rhinosinusitis: a retrospective analysis of clinical pattern and outcome in north western Nigeria. Annals of African medicine. 2010;9(1).
5. Adoga AA, Ma'an ND. The Epidemiology and Economic Impact of Rhinosinusitis in Jos, North Central Nigeria.

6. Chen Y, Dales R, Lin M. The epidemiology of chronic rhinosinusitis in Canadians. The Laryngoscope. 2003 Jul;113(7):1199-205.

7. Jarvis D, Newson R, Lotyall D, Hastan D et al; Asthma in adults and its association with CRS: the GA2LEN survey in Europe. Allergy 2012, 67(1):91-98

8. Amodu EJ, Fasunla AJ, Akano AO, Olusesi AD. Chronic rhinosinusitis: correlation of symptoms with computed tomography scan findings. Pan African Medical Journal. 2014;18(1).

9. Li C, Musich PR, Ha T, Ferguson DA, Patel NR, Chi DS, Thomas E. High prevalence of Helicobacter pylori in saliva demonstrated by a novel PCR assay. Journal of clinical pathology. 1995 Jul 1;48(7):662-6.

10. Fokkens W, Lund V, Mullol J. European position paper on rhinosinusitis and nasal polyps 2007. Rhinology. Supplement. 2007;20:1-36.

11. Pilan RR, Pinna FR, Bezerra TF, Mori RL, Padua FG, Bento RF, Perez-Novo C, Bachert C, Voegels RL; Prevalence of chronic rhinosinusitis in Sao Paulo. Rhinology 2012,50(2):129-138

12. Shi JB, Fu QL, Zhang H, Cheng L, Wang YJ, Zhu DD, Lv W, Liu SX, Li PZ, Ou CQ, Xu G. Epidemiology of chronic rhinosinusitis: results from a cross-sectional survey in seven C hinese cities. Allergy. 2015 May;70(5):533-9.

13. Fokkens W, Lund V, Mullol J; European position paper on rhinosinusitis and nasal polyps 2007. Rhinology2007, 20:1-136

14. Kim YS, Kim NH, Seong SY, Kim KR, Lee GB, Kim KS. Prevalence and risk factors of chronic rhinosinusitis in Korea. American journal of Rhinology & Allergy. 2011 May; 25(3):e117-21.

15. Hastan DF, Fokkens WJ, Bachert C, Newson RB, Bislimovska J, Bockelbrink A, Bousquet PJ, Brozek G, Bruno A, Dahlén SE, Forsberg B. Chronic rhinosinusitis in Europe–an underestimated disease. A GA2LEN study. Allergy. 2011 Sep;66(9):1216-23.