

An evaluation of role of sinusitis as focal sepsis in chronic otitis media active mucosal disease: A cross-sectional survey

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Abstract

Background: Sinusitis causes inflammation of the middle ear mucosa with increased and persistent mucoid/ mucopurulent discharge and remains as a active mucosal disease. Without correcting the sinusitis the management of ear including surgery has frequently led to failures and poor prognosis.

Objectives: To establish the role of Sinusitis as Focal sepsis in Chronic Otitis media active mucosal disease. An additional objective was to accentuate the need of proper diagnostic endoscopic evaluation and improvement in middle ear mucosal disease status after functional endoscopic sinus surgery.

Material and methods: A total of 50 patients aged 18-49 years with Chronic otitis media active mucosal disease (Tubotympanic type of C.S.O.M.) patients with persistent ear discharge even following culture directed topical and systemic antibiotics with 3 months and more of ear discharge seeking care at Otorhinolaryngology outpatient department were included in this study.

Results: Mean age of patients was 42.5 ± 10.6 years. 76% subjects were found having septal deviation/ turbino-septal deformity which was the most common anatomical variant, 34% had enlarged middle turbinate, 32% had medialised uncinate, 30% had enlarged bulla, 22% had enlarged bulla with prominent agger and 18% had paradoxical middle turbinate. Of these 22 patients had the accessory ostium in the posterior fontanel and 10 patients had accessory ostium in the anterior fontanel. Majority (26, 52%) of subjects had Grade I disease i.e. minimal disease limited to Osteo Meatal Complex followed by Grade II 24% i.e. moderate incomplete opacification of one or more sinuses. On otoendoscopy, 36 patients (72%) had a large central perforation, while 14 patients (28%) had a subtotal central perforation.

Conclusion: A thorough diagnostic nasal evaluation of all Chronic Otitis Media active mucosal type of patients is essential in comprehensive management of the disease. Deviated nasal septum, enlarged middle turbinate, medialised uncinate predispose to sinusitis.

Key words

Chronic otitis media active mucosal disease, Sinusitis, Functional endoscopic sinus surgery.

Introduction

Chronic Suppurative Otitis Media (CSOM) is the chronic inflammation of the middle ear (ME) cleft with history of ear discharge for more than 3 months and permanent tympanic membrane defect. The pathogenesis of CSOM has been related to the presence of prior or concurrent nasal disease. Infection of the nose and paranasal sinuses (PNS) can involve the Eustachian tube (ET) leading to its obstruction. Sinusitis causes inflammation of the middle ear mucosa with increased and persistent mucoid/ mucopurulent discharge and remains as a active mucosal disease [1, 2].

Chronic Otitis Media active mucosal type is a longstanding infection of a part or whole of mucoperiosteal lining of middle ear cleft characterized by ear discharge and a permanent perforation. A perforation becomes permanent when its margins are covered by squamous epithelium and does not heal spontaneously. Sinusitis is the main and most significant etiological factor for middle ear disease of COM – active mucosal type and treating sinusitis by FESS in subjects result in the good outcome of disease clearance [3, 4].

Chronic otitis media active mucosal disease patients with coexisting active sinusitis have a chronically persistent ear discharge [5]. Without correcting the sinusitis the management of ear including surgery has frequently led to failures and poor prognosis. Therefore it was essential to establish the role of Sinusitis as Focal sepsis in Chronic Otitis media active mucosal disease. Additional objectives were to accentuate the need of proper diagnostic endoscopic evaluation and improvement in middle ear mucosal disease status after functional endoscopic sinus surgery.

Material and methods

The current survey was planned and carried out in the Department of Otorhinolaryngology of a tertiary care teaching hospital of northern India during June 2012 to May 2014. A total of 50 patients aged 18-49 years with Chronic otitis media active mucosal disease (Tubotympanic type of C.S.O.M.) patients with persistent ear discharge even following culture directed topical and systemic antibiotics with 3 months and more of ear discharge seeking care at Otorhinolaryngology outpatient department were included in this study. Ear discharge of the patients was sent for culture and sensitivity. The

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patients were treated with culture directed antibiotics oral as well as topical and followed up for a period of one month. X-ray of the both mastoids was also taken.

Patients diagnosed with Chronic otitis media active squamous, inactive mucosal, inactive squamous, adhesive otitis media patients, having recurrent chronic otitis media patients after ear surgery, fungal infection of external ear, patients with adenoid hypertrophy, mass in nose and paranasal sinuses and polyposis of sinuses; and hearing loss more than 40 db were excluded. Eligible subjects were selected randomly from the patients seeking care at Otorhinolaryngology outpatient department. The patients selected were subjected to Diagnostic Nasal Endoscopy (DNE). Patients with evidence of sinusitis were treated with antibiotics, antihistamines, mucolytics and decongestants and other supportive medicines for a period of six weeks. Though they had a symptomatic improvement they had a frequent relapse of symptoms. They were again evaluated with DNE and CT of PNS. Then they underwent Functional Endoscopic Sinus Surgery (FESS) and were followed up post operatively every 2 weeks for a period of 3 months. The patients were assessed every 2 weeks by otoendoscopy for cessation of discharge and improvement in middle ear mucosal status.

Gathered information was coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed as proportions. Interpretation of the collected data was done by using appropriate statistical methods.

Results and Discussion

Data of fifty patients was processed and analyzed to establish the role of Sinusitis as Focal sepsis in Chronic Otitis media active mucosal disease in the current study. CSOM is defined primarily as a disease of pediatric age group [6]. Another study observed maximum prevalence of CSOM

in the younger age group [7, 8]. Mean age of patients was 42.5 ± 10.6 years. Out of total, 29 were females whereas remaining 21 were male patients. Forty one (82%) subjects were from rural areas whereas remaining nine cases (18%) hailed from urban areas. Thirty nine cases (78%) belonged to the lower socio-economic group, 8 cases (16%) belonged to middle economic group and remaining 3 cases (6%) belonged to the higher socio-economic group.

Diagnostic Nasal Endoscopy (DNE) revealed that 76% subjects were found having septal deviation/ turbinoseptal deformity which was the most common anatomical variant, 34% had enlarged middle turbinate, 32% had medialised uncinata, 30% had enlarged bulla, 22% had enlarged bulla with prominent agger and 18% had paradoxical middle turbinate.

Regarding accessory ostium, it was found in 32 patients. Of these 22 patients had the accessory ostium in the posterior fontanel and 10 patients had accessory ostium in the anterior fontanel. All patients had discharge in middle meatus. Regarding nature of discharge, it was mucopurulent in 25 patients (50%), it was purulent in 16 patients (32%) and mucoid in 9 patients (18%). In 78% of cases the discharge was seen below the Eustachian tube orifice and in 22% of cases, the discharge was seen above Eustachian tube orifice.

On analyzing reports of CT Scan of Para Nasal Sinuses, majority (26, 52%) of subjects had Grade I disease i.e. minimal disease limited to Osteo Meatal Complex followed by Grade II 24% i.e. moderate incomplete opacification of one or more sinuses, 14% had Grade III – complete opacification of one or more major sinuses, not all and 6% of subjects had Grade IV disease- total opacification of all sinuses. CT Scans PNS was observed to be normal among 4% of subjects.

Someone emphasized that otitis media is a multifactorial disease which was affected by many etiologies including nasal, and paranasal

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sinus abnormalities [9]. The present study confirmed these findings. Others were of the view that diseases of the sinuses are the main cause of CSOM rather than adenoid in adolescents and adults for Eustachian tube block [10].

The most frequent anatomic variant on CT scan was deviated nasal septum (DNS) in 38 patients (76%). Concha bullosa was found in 17 patients (34%). Medialised uncinate with maxillary mucosal thickening was found in 16 patients (32%). Enlarged bull narrowing OMC was seen in 15 patients (30%). Prominent agger cell obstructing the frontal recess was found in 9 patients (18%). Yeolekar reported presence of sinonasal pathology in 90% patients [11]. Poorey and Iyer reported presence of pharyngeal and sinonasal pathology in 93% patients [12].

All the patients found to be having anatomic variants and signs strongly suggestive of chronic sinusitis on diagnostic nasal endoscopy and Computed Tomography scan of Paranasal Sinuses. On otoendoscopy, 36 patients (72%) had a large central perforation, while 14 patients (28%) had a subtotal central perforation.

Otoendoscopy was performed to ascertain mucosal status of middle ear. It was found that 36 patients (72%) had edematous Wet/Inflamed mucosa, while remaining 14 patients (28%) had polypoidal (boggy) mucosa. It indicates poor Eustachian tube function. The incidence of unilateral and bilateral ear discharge in the selected patients, it was found to be 14 (28%) and 36 (72%) respectively. When the incidence of unilateral and bilateral sinusitis was compared in these patients, it was found to be identical. The patients with unilateral ear discharge had signs of chronic sinusitis and discharge around the Eustachian tube orifice of ipsilateral side only. Another study observed that majority of patients with CSOM presented with nasal obstruction [13]. In another study reported that prevalence of secretory otitis was significantly related to nasal obstruction [14].

Functional Endoscopy Sinus Surgery (FESS) was performed in these patients by Stammberger technique for the treatment of chronic sinusitis. Patients with unilateral sinusitis underwent surgery only on the diseased side. Thirty five patients (70%) also underwent septoplasty.

Improvement in the middle ear mucosal status was assessed following clearance of sinusitis among study subjects. Out of 36 patients with moist/wet and inflamed mucosa, 31 patients showed improved mucosal status while remaining 5 patients had no improvements in mucosal status. Further treatment by way of regular antibiotic and/or betadine wash of the ear, suction cleaning and culture directed topical antibiotics improved the mucosal status in 3 more patients. Another study highlighted allergic rhinitis to be one of the important predictors of CSOM [15]. Rhinitis is influential in the occurrence of CSOM via two mechanisms which include Eustachian tube dysfunction secondary to allergic reactions effective on nasal mucosa, and decrease in the frequency of ciliary whipping motions [16].

Out of 14 patients with boggy and polypoidal mucosa, 11 patients showed improved mucosal status after surgery alone, while 2 more patients had improved mucosal status with antibiotic and regular suction cleaning with culture directed topical antibiotics. Forty one patients (82%) had improved middle ear mucosal status after clearance of sinusitis, whereas 9 patients (18%) showed no improvement in the middle ear mucosal status. These patients with improved middle ear mucosal status were further treated with cortical mastoidectomy or myringoplasty.

Of the 9 patients, who did not show improvement of middle ear mucosal status were further investigated, four patients had hypo function of the eustachian tube as demonstrated by the dye test and 5 patients had recurrence of sinusitis due to failure of the surgical procedure. Another study observed that sinonasal disease is the most common cause for the persistence of ear symptoms in chronic otitis media and supported

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by their improvement after treating the sinonasal pathology. Author emphasized that evaluation and management of sinuses is a must in all cases of chronic otitis media [11].

Conclusion

On the basis of findings of current study it can be concluded that a thorough diagnostic nasal evaluation of all Chronic Otitis Media active mucosal type of patients is essential in comprehensive management of the disease. Deviated nasal septum, enlarged middle turbinate, medialised uncinate are the most common anatomical variants of nose and Paranasal sinuses predisposing to sinusitis. Clearance of sinusitis by FESS in Chronic Otitis Media active mucosal type of diseased patients results in good outcome of the middle ear disease clearance by further ear surgery.

References

1. Mion O, de Mello JF Jr, Lessa MM, Goto EY, Miniti A. The role of rhinitis in chronic otitis media. *Otolaryngol Head Neck Surg*, 2003; 128(1): 27-31.
2. WHO. Chronic suppurative otitis media: Burden of illness and management options, World Health Organization, Geneva, Switzerland, 2004.
3. Kim CS, Jung HW, Yoo KY. Prevalence of otitis media and allied diseases in Korea- Results of a nation-wide survey 1991. *J Korean Med Sci*, 1993; 8: 34-40.
4. Van Cauwenberge P, Derycke A. The relationship between nasal and middle ear pathology. *Acta Otorhinolaryngol Belg*, 1983; 37: 830-41.
5. Fujita A, Honjo I, Kuzeta K. Refractory Otitis Media, Organic Abnormalities of Eustachian tube dysfunction. *American Journal of Oto Laryngology*, 1993; 14(3): 187-190.
6. Nelson JD. Chronic suppurative otitis media, *Pediatr. Infect Dis. J.*, 1988; 7(6): 446-448.
7. Shrestha D, Thapa P, Bhandari YB. Types of pathology and ossicular status in atticofacial disease undergoing mastoidectomy at Bir Hospital. *Journal of College of Medical Sciences-Nepal*, 2010; 6(4): 26-30.
8. Karki R, Rai K. Pattern of Otorhinolaryngological Diseases at Rural Medical Camps in Far Western Region of Nepal. *MJSBH*, 2012; 11(2): 29-31.
9. Fireman P. Otitis media and nasal disease: a role for allergy. *J Allergy Clin Immunol*, 1988; 82(5): 917-26.
10. Blue Stone CD. Assessment of Eustachian tube function. In Jerger J (Ed): *Handbook of clinical impedance Audiometry*, New York, American Electormedics Corporation, 1975, p. 127-148.
11. Yeolekar AM, Dasgupta K S. Otitis media: Does the onus lie on sinonasal pathology? *Indian J Otol*, 2011; 17: 8-11.
12. Poorey VK, Iyer A. Study of Bacterial Flora in CSOM and its Clinical Significance. *Ind. J. Otolaryngol., Head & Neck Surg.*, 2002; 54(2): 91-95.
13. Bozkus F, Bozan N, Iynen I, Sakin YF, Kiris M. Analysis of sinonasal, pharyngeal and allergy-related risk factors for chronic suppurative otitis media. *Acta Medica Mediterranea*, 2013, 29: 47-52.
14. Suarez Nieto C, Malluguiza Calvo R, Barthe Garcia P. Aetiological factors in chronic secretory otitis in relation to age. *Clin Otolaryngol Allied Sci.*, 1983; 8(3): 171-4.
15. Ghonaim MM, El-Edel RH, Bassiony LM, Alzaharani SS. Otitis Media in Children: Risk Factors & Causative Organisms. *IJMBS*, 2011; 3(5): 160-65.
16. Hurst DS. The role of allergy in otitis media with effusion. *Otolaryngol Clin North Am*, 2011; 44(3): 637-54.