Section: ENT

Original Research Article

ASSOCIATION OF DEVIATED NASAL SEPTUM IN CHRONIC OTITIS MEDIA ACTIVE MUCOSAL DISEASE

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ABSTRACT

Background: To find out the association of deviated nasal septum in chronic otitis media in active mucosal disease. To ascertain that there is overall improvement in the management of chronic otitis media active mucosal disease after doing septoplasty. The objective is to assess the relation between occurence of deviated nasal septum with chronic otitis media of active mucosal disease.

Materials and Methods: This is hospital based prospective study of subjects presented with chronic otitis media with active ear discharge. Data of history, clinical examination, investigations, radiological data is obtained and analysed for comparison.

Results: The results of the study highlight complex linkages between chronic otitis media and show a high frequency of sinonasal diseases. It is noteworthy that all COM patients had nasal pathology, with 84% of them having a deviated nasal septum, the most frequent sinonasal problem. In addition, 7% of patients had nasal polyposis and 9% had chronic rhinosinusitis.

Conclusion: COM had a significant incidence of deviated nasal septum, which was followed by nasal polyposis and chronic rhinosinusitis, underscoring the need for thorough assessment and well-coordinated therapeutic approaches.

Keywords: Nasal Septum, Chronic Otitis, prospective study.

INTRODUCTION

Chronic Suppurative Otitis Media (CSOM), particularly in countries with limited resources, is a significant and avoidable cause of hearing loss, according to the World Health Organisation (WHO). It continues to be a major worldwide health concern, especially in places with little access to healthcare.[1,9]

Definition: Chronic inflammation of the middle ear leads to persistent mucopurulent discharge, hearing impairment, and perforation in middle ear.[1] Firstly, since Chronic Otitis Media (COM) is not always associated with pus formation, it is considered equivalent to the outdated term "chronic suppurative otitis media" (CSOM), a designation that is no longer recommended for use. Yet, there is still a difference between inactive COM, in which there is no inflammation but there is a possibility that the ear may later become active, and active COM, which is marked by inflammation and pus production.[2,3] Permanent alterations in the pars tensa are a hallmark of the third diagnostic group, Healed Chronic Otitis Media (COM). The condition is still inactive, though, because neither the pars tensa nor the pars flaccida have undergone any notable retractions, and the pars tensa remains intact. Additionally, successful surgery may result in healed COM.[4,5] Bacterial infection and Eustachian tube dysfunction are two major factors in the complex pathophysiology of CSOM.[6,7] But more and more recent studies have brought attention to the intricate connection between ear disorders and sinonasal pathology. There is strong evidence linking sinonasal abnormalities to otitis media, according to studies by Singh, P.P., Kuchhal, V., Bhatt, J., et al. (2014) and Adan Jr., W. C., Cruz, E. T. S., et al. (2016). Furthermore, Damar, M., A.E., et al. (2017) found that sinonasal structural alterations such as Concha Bullosa and Nasal Septal

Deviation play a role in the development and progression of Chronic Suppurative Otitis Media (CSOM).

With this knowledge, it is essential to evaluate CSOM patients thoroughly, taking into account both their possible sinonasal contributions and otologic manifestations.

Radiological imaging, endoscopic findings, and other diagnostic technologies are essential for a more thorough and objective evaluation, even though the history and physical examination still form the basis of the initial evaluation.[8,9]

A combined approach to patient management is crucial because of the proven Connection among sinonasal disorders and CSOM.[10,11] Coordination between otolaryngologists, audiologists, allergists, and other pertinent medical specialists is necessary for efficient assessment and treatment.[9,12]

Furthermore, knowing how CSOM and sinonasal diseases are related has important ramifications for healthcare policy and public health campaigns. Educating the public and medical professionals about the connection between ear and sinonasal diseases can help with early detection, timely treatment, and better results for those who are impacted.[13] As a result, this study not only advances our knowledge of CSOM but also helps guide larger initiatives to lessen the prevalence of ear and sinus disorders worldwide. This study aims to make a significant contribution to the relationship between Deviated nasal septum and CSOM by carefully analyzing and interpreting clinical data.[14]

MATERIALS AND METHODS

Study Design: Hospital based prospective study

Study Location: Study conducted in the Department of ENT, Government ENT Hospital, Andhra medical college, Visakhapatnam

Sample Size: 100.

Study Duration: 1 year 6 months (June 2023 – December 2024).

Study Population: Adults aged 18-49 years visiting the outpatient department (OPD) or admitted to the Government ENT Hospital, Visakhapatnam.

Inclusion Criteria

1. Age:18-49 Years
2. Sex: Both sexes selected
3. Chronic otitis media active mucosal disease (Tubotympanic type of CSOM) patients with persistent ear discharge even following culture directed topical and systemic antibiotics.
4. Duration of ear discharge:6months and more.

Exclusion Criteria

1. Chronic otitis media active squamous, inactive mucosal, inactive squamous, adhesive otitis media patients.
2. Recurrent chronic otitis media patients after ear surgery.

Methodology

- Patients coming under the criteria will be selected
- Written informed consent in the local language will be acquired from each participant.
- An interview is conducted using a questionnaire
- A thorough examination of the patient is done.
- The whole information is compiled, statistical analysis is done.
- Patients who attend the Government ENT hospital during the study period and have chronic otitis media active mucosal type (Tubotympanic type of CSOM) make up the study population.
- 100 patients underwent a thorough evaluation with an emphasis on taking a thorough history of ear symptoms, including discharge, otalgia, tinnitus, hearing problems, and related nasal symptoms are randomly selected from our outpatients attending ENT OPD.
- The patient sends their ear discharge for sensitivity and culture. Oral and topical culture-directed antibiotics are administered to the patients, who are monitored for a month.
- Then the patients selected for the study are looked for presence of deviated nasal septum and grading of Deviated nasal septum was done.
- And if patients are symptomatic, diagnostic tools like anterior rhinoscopy, CT scans, and X-rays are used for evaluation, while rigid nasal endoscopy is avoided in severe cases.
- Treatment is not necessary for asymptomatic individuals, but surgical correction is recommended when DNS causes significant obstruction or complications.
- The primary surgical method is septoplasty, which involves raising the mucoperichondrial flap on one side and correcting the deviated cartilage. Submucous resection (SMR), a more extensive procedure, is used in select cases and involves removing the deviated cartilage and bone after careful mucosal elevation.
- Proper anaesthesia and post-operative care, including nasal packing and antibiotics, are essential for successful outcomes.

Complications like hemorrhage, septal perforation, flapping, dorsum collapse, tip drooping, and adhesions can occur if not meticulously managed.

SMR is contraindicated in children under 18 due to the risk of disrupting nasal growth centers and potential deformity.

Data were extracted from files using pre-structured data extraction sheet for standardisation to avoid errors in data extraction

All the data will be entered into an Excel spreadsheet and analysis done using SPSS version 25.0

Statistical Analysis

- Microsoft Excel will be used for data entry.

- Quantitative data will be presented using means and standard deviations, whereas qualitative data will be displayed as frequencies and percentages.
- To assess association, the chi square test is used.
- Additionally, as required, pertinent statistical test can be used.

RESULTS

The study population comprised 100 carefully documented cases.

Demographic Distribution

Gender Proportions:

Females represented 56% (n = 56) of the study cases, while males accounted for 44% (n = 44).

Table 1: Distribution of CSOM patients according to Gender proportions

Subgroup	Count	Percentagae
Male	44	44
Female	56	56
Total	100	100

Age Breakdown: The highest disease frequency was concentrated in older adults, with the 40–49 age bracket contributing 51% of cases (n = 51). The 18–29 age group accounted for 28% (n = 28), and the 30–39 range comprised 21% (n=21).

Table 2: Distribution of CSOM patients according to Age

Category	Frequency	Percentage
18-29	28	28
30-39	21	21
40-49	51	51
total	100	100

Laterality and Side-Specific Distribution: According to the gender and affected ear side distribution of CSOM patients, six out of the fifty-six patients in the female group had bilateral involvement, twenty have right ear involvement, and thirty have left ear involvement. four of the forty-four Males have bilateral involvement, twenty-two have right ear involvement, and eighteen have left ear involvement. This suggests that bilateral involvement is less prevalent in both sexes, with left ear involvement being more common in females and right ear involvement in males.

Table 3: Laterality and Side-Specific Distribution

Disease Category Location	Female Cohort Count (n=56)	Male Cohort Count (n=44)	Total Cases Breakdown
Bilateral involvement	6	4	10
Right ear only	20	22	42
Left ear only	30	18	48
Total	56	44	100

Table 4: Distributions of CSOM patients according to Nasal pathology

Nasal pathology	Frequency	Percentage
DNS	84	84
CRS with NP	7	7
CRS without NP	9	9
Total	100	100

Out of 100 cases, majority of them are contributed by Deviated Nasal Septum accounting for 84%, followed by CRS without polyposis accounting for 9% and CRS with polyposis accounting for 7%.

Table 5: Distribution of CSOM patients with laterality according to nasal pathology (N=100)

Nasal pathology	Left ear	Right ear	Bilateral
DNS	37	40	7
CRS with NP	2	4	1
CRS without NP	3	4	2
Total	42	48	10

Table 6: Distribution of CSOM patients based On Otoendoscopic Findings

Otoendoscopy findings	Right ear	Left ear	Both ear
Central perforation with boggy polypoidal mucosa	5	7	1
Central perforation with wet and edematous mucosa	10	12	3
Large Central perforation with boggy polypoidal mucosa	7	6	1
Large Central perforation with wet and edematous mucosa	7	9	2
Subtotal perforation with boggy polypoidal mucosa	3	4	1
Subtotal perforation with wet and edematous mucosa	8	10	2

On otoendoscopic examination of patients, diagnosed as chronic otitis media, a variety of tympanic membrane perforation types along with differing middle ear mucosal conditions were observed. The most frequent finding was a Central perforation associated with wet and edematous mucosa, predominantly seen in the left ear (12 cases) and the right ear (10 cases), with 3 cases of bilateral involvement noted in this category. Subtotal perforation with wet and edematous mucosa was the second most frequent observation, found in 8 right ears, 10 left ears, and 2 cases with bilateral involvement. Another commonly encountered pattern was large central perforation with wet and edematous mucosa, present in 7 right ears, 9 left ears, and 2 bilateral cases.

Less frequently observed combinations included large central perforation with boggy, polypoidal mucosa 7 in right ears 6 in left ears 1 in bilateral case. Central perforation with boggy and polypoidal mucosa was observed in 5 right ears 7 left ears and 1 bilateral case. Subtotal perforations with boggy edematous mucosa were documented in 3 right ears, 4 left ears, and 1 bilateral case.

Table 7: Outcome of middle ear mucosa after Sinonasal surgery (followup after 6 months) (N=100)

	Outcome of middle ear mucosa after surgery	No of cases
Wet and edematous	Improved	62
	Not improved	3
Boggy,polypoidal	Improved	34
	Not improved	1

An assessment of the middle ear mucosal status after surgery showed that most patients had significantly improved. Among patients who initially presented with wet and edematous mucosa, 62 cases showed improvement, while only 3 cases failed to show any postoperative recovery. Similarly, in those with boggy, polypoidal mucosa, 34 cases demonstrated improvement, and just 1 case showed no significant change following surgery. These findings indicate that surgical intervention was largely effective in promoting mucosal healing, even in cases with more severe inflammatory changes.

DISCUSSION

In a critical field of otolaryngology, the relationship among CSOM and DNS is examined in the study "Association of Deviated Nasal Septum in Chronic Otitis Media Active Mucosal Disease" carried out at a Government ENT Hospital in Visakhapatnam.

Recurrent ear discharge through a ruptured tympanic membrane and ongoing inflammation are hallmarks of chronic suppurative otitis media (CSOM). For better treatment results and efficient management, it is essential to comprehend the connection among CSOM and sinonasal diseases.

DNS is the most common sinonasal illness known to affect the middle ear and also few cases of sinusitis, nasal polyps because of the physiological and anatomical links that exist between the middle ear and nasal cavity via Eustachian tube. The Eustachian tube, which acts as a conduit for infections and inflammation to travel from the. nasopharynx to. the middle ear, aggravates conditions like CSOM. Diagnosing and treating sinonasal disorders in individuals with CSOM is essential to avoiding complications and enhancing clinical outcomes.

The results of the study show a strong link between sinonasal diseases and CSOM. The need of thorough assessment and treatment of sinonasal problems is highlighted by the high occurrence of diseases including sinusitis and nasal polyps in CSOM patients. By treating these coexisting disorders, medical professionals may be able to lower the incidence of middle ear infections and enhance the general well-being of those who are impacted.

According to the study's findings, otolaryngologists must manage CSOM. patients holistically in clinical settings, paying special attention to the nasal septum's function in preserving adequate sinonasal drainage and clearing. Imaging tests like CT scans to detect sinus involvement and nasal endoscopy for evaluating nasal and sinus pathology, including any septal abnormalities that may compromise normal drainage, should be part of a comprehensive examination and treatment of sinonasal illnesses. Persistent sinonasal illness can be exacerbated by a deviated septum, which can also impede nasal airflow.

In order to address septal pathology when it occurs, customized treatment plans should include both surgical procedures when necessary, such as septoplasty, nasal polypectomy, or, functional endoscopic sinus surgery (FESS), as well as medical management with antibiotics, topical steroids, and saline nasal irrigation. Reducing inflammation, increasing sinonasal clearance, and correcting septal abnormalities can all enhance CSOM results.

This conversation highlights the growing understanding of Deviated Nasal Septum (DNS) in connection with CSOM and highlights the consequences for public health, management, and clinical practice. It is evident that an integrative strategy is necessary when these findings are integrated with the body of previous literature. In order to enhance patient outcomes and lessen the burden of chronic ear and sinonasal illnesses, Otolaryngologists, researchers, and health professionals must continue their research and work

together to develop best practices for the integrated management of CSOM and DNS.

Prevalence and Demographic Characteristics: The study population's demographic profile sheds important light on the characteristics and prevalence of chronic suppurative otitis media (CSOM), especially with regard to age and gender distribution. According to our study, there were predominant female patients. (56%) than male patients (44%), which is consistent with results from other research in particular populations. This gender disparity suggests that varying susceptibilities or even different ways that men and women seek medical attention could have an impact on the prevalence of CSOM.

Additionally, the study's patients' mean age was 40 years, with a sizable percentage of them being between the ages of 31 and 50. The broad range of people impacted by CSOM is highlighted by this age distribution, underscoring the importance of healthcare approaches that emphasizes the needs of both middle-aged and younger adults. To lessen the effects of the illness and avoid long-term problems including hearing loss, early management and continuing care are essential.

It's critical to comprehend these changes in demographics in order to allocate resources and tailor healthcare plans. This information can be used by healthcare professionals to create specialized programs for screening, educational campaigns, and treatment plans that are suited to the unique requirements of various CSOM-affected patient groups. Healthcare systems can improve patient outcomes and quality of life by combining demographic insights with clinical results and epidemiological trends to provide timely and efficient care.

Ear Involvement and Gender Distribution: Given that the occurrence of chronic suppurative otitis media (CSOM) by ear involvement shows gender inequalities that correspond with documented anatomy variations between the sexes, more research is required to investigate the underlying mechanisms causing these gender-specific patterns. Understanding these mechanisms could aid in understanding the causes of CSOM and potentially direct treatment plans tailored to a patient's gender. More investigation into these disparities and gender-related prevalence may result in better methods for diagnosis and therapy, which would improve the effective management of CSOM.

Based on gender patterns of CSOM prevalence may be due to variations in ear structure, hormonal impacts, or environmental exposure.

In order to inform treatment plans and prevention measures based on gender-specific hazards, it may be possible to betdiscuter understand why men typically involve their right ear and women their left. Furthermore, for clinical practice to improve patient outcomes and management techniques, it is still essential to comprehend the rates of bilateral involvement and the uneven manifestation of CSOM.

Association with Sinonasal Pathologies: The results of the study highlight complex linkages between chronic suppurative otitis media (CSOM) and show a high frequency of sinonasal diseases among patients with CSOM. It is noteworthy that all CSOM patients had nasal pathology, with 84% of them having a deviated. nasal septum, the most frequent sinonasal problem. In addition, 7% of patients had nasal polyposis and 9% had chronic rhinosinusitis.

The complex relationships and possible causes among CSOM and sinonasal diseases are highlighted by these findings. The thorough care of CSOM requires addressing nasal pathology since treating underlying sinonasal illness may improve treatment outcomes and lower recurrence rates Chronic rhinosinusitis, nasal polyposis, and a deviated nasal septum all occur together, which may indicate a mutually exacerbating link between middle ear and nasal illnesses or shared pathophysiological pathways.

A comprehensive strategy that incorporates both otological and rhinological examinations is necessary to maximize treatment approaches and enhance clinical outcomes for individuals with CSOM. To better understand the exact mechanisms underlying these connections and determine whether targeted therapy for sinonasal diseases could enhance CSOM treatment and outcome, more study is required.

Implications for Clinical Practice: Clinical implications of the study's results for the management of chronic suppurative otitis media (CSOM) are significant. The significant prevalence of DNS in patients with CSOM first emphasizes how critical it is to evaluate nasal and paranasal sinus problems in these patients. Correctly diagnosing and treating sinonasal diseases including nasal polyps and septal abnormalities early on may enhance treatment outcomes for CSOM and decrease complications. Secondly, the observed gender specific patterns of ear involvement—left ear majority in girls and right ear majority in males—highlight the necessity of customized treatment regimens that consider anatomical characteristics specific to each gender. These specialized techniques may include tailored treatment plans that account for these anatomical variances, potentially improving therapy efficacy and patient results in the treatment of CSOM.

These findings highlight the necessity of an integrative approach in medical care, wherein otolaryngologists and rhinologists work closely together to evaluate and treat middle ear and sinonasal problems holistically. Particular to gender, anatomical. variances and their significance for therapeutic techniques in controlling CSOM may be clarified by additional research.

CONCLUSION

Chronic Suppurative Otitis Media (CSOM) provides significant fresh knowledge into the complex interplay involving nasal illness and middle ear function. Determining the prevalence of several sinonasal illnesses, mainly DNS, in patients with CSOM, assessing clinical and demographic characteristics, and looking into the consequences for medical practice and community health initiatives were the goals of this study.

The results of the study show that individuals with CSOM had a significant incidence of deviated nasal septum, which was followed by nasal polyposis and chronic rhinosinusitis. These results are consistent with earlier studies showing the important part that sinonasal disorders play in the development and course of CSOM, underscoring the need for thorough assessment and well-coordinated therapeutic approaches.

In both genders, bilateral involvement appeared fewer in number, indicating that CSOM typically manifests unilaterally in clinical settings. Ear involvement showed genderspecific patterns, with males more likely to have right ear involvement and females more likely to have left ear involvement. These anatomical variations highlight the necessity of individualized treatment plans that take gender-specific variances into account.

The study promotes a multidisciplinary approach to CSOM care from a clinical standpoint, encouraging cooperation between. Allergists, audiologists, otolaryngologists, and other experts. In order to maximize treatment results, lower recurrence rates, and maintain hearing function in those who are impacted, early detection and management of sinonasal diseases are essential. Reducing the likelihood of chronic middle ear illness and its related problems may be possible by treating underlying nasal diseases including chronic rhinosinusitis and septal deviations.

Consistent results about the influence of sinonasal pathologies on CSOM outcomes are found when compared to the body of existing literature. Similar findings are made by Singh. et al. (2014.) and Sonawale. et al. (.2018), who highlight the frequency of pathologies in nose and sinonasal areas that contribute to CSOM and support integrated management approaches. These combined results lend credence to the need for complete examination and individualized treatment programs that meet the needs of each patient.

This study admits a number of limitations despite the insightful information gathered. Because the single-center, observational methodology may limit generalizability to larger populations, future multi-center research is needed to confirm findings across a spectrum of demographic categories and geographic areas. Further research directions are suggested by the study's primary focus on anatomical factors rather than genetic or environmental factors that contribute to CSOM and sinonasal diseases.

In order to lessen the worldwide burden of CSOM and related hearing loss, this research supports increased awareness and early intervention programs from a public health standpoint. Public health initiatives can support early detection, timely intervention, and better outcomes for those impacted by ear and sinonasal health disorders by raising awareness among medical professionals and the general public about the interconnectedness of these conditions.

In conclusion, this study highlights the value of integrated approaches to patient care while also substantially advancing scientific knowledge of CSOM and sinonasal disorders. Clinicians can increase treatment efficacy, halt the course of the disease, and ultimately improve the standard of life for patients with CSOM worldwide by addressing sinonasal diseases holistically and utilizing interdisciplinary knowledge. To enhance clinical care and maximize results for this patient population, future studies should keep examining new pharmaceutical approaches, predispositions from genes, and external influences.

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