European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 09, Issue 03, 2022

ORIGINAL RESEARCH

A Clinico Pathological Study of Extra Cranial Complications of Chronic Suppurative Otitis Media(CSOM) and Their Management in A Tertiary Care Centre

A Rakesh Babu[1], N. Uma[2], P. Gunavathi[3]

[1]Senior Resident, Department of ENT, Kakatiya Medical College, Warangal, Telangana, India.
[2]Senior Resident, Department of ENT, Gandhi Medical College, Secunderabad, Telangana, India.
[3]Senior Resident, Department of ENT, Government Medical College, Mancherial, Telangana, India.

ABSTRACT

Background: Despite the rise in antibiotics use,complications of chronic suppurative otitis media(CSOM)remain quite frequent, have high morbidity and mortality rates, and pose a challenge to the otolaryngologist especially in developing countries like India.The present prospective study was conducted at our tertiary care hospital to evaluate the clinico pathological profile of Extracranial complications of CSOM and their management.

Materials And Methods: We analysed all patients presenting with Extracranial complications with regards to their age,sex distribution and types of complications and types of surgical management.

Result: In our study a total of 50 cases of Extracranial complications were reviewed in the study period of 2yrs.Of the total 50 cases, 32 cases were male and 18 cases were females. Age distribution of the patients ranges from 4 - 70 yrs with a mean age of 37 yrs. Of these 22 patients(44%) had mastoiditis alone as a complication of CSOM,subperiosteal abscess in 14 patients (28%), 7 cases (14%) had Postauricular fistula. 4 cases (8%) of Facial nerve weakness and 3 cases(6%) of Labyrinthitis. Surgery was the main modality of treatment of which Canalwall down mastoidectomy was done in 25 cases (50%), intact canal wall mastoidectomy in 16 cases (32%)and cortical mastoidectomy in 9 cases(18%).

Conclusion: Extracranial complications of CSOM are rare today, but they still have a hazardous potential.Early diagnosis and prompt treatment reduce the incidence and improve quality of life in these patients. Our study emphazizes the same,and we hope to generate some awareness leading to further reduction in morbidity and mortality.

Keywords: Chronic suppurative otitis media,extra cranial complications, mastoiditis, post aural abcess,facialpalsy, labyrynthitis.

Corresponding Author: Dr. A Rakesh Babu, Senior Resident, Department of ENT, Kakatiya
Medical College, Warangal, Telangana, India.
Email: rakx4u@gmail.com

INTRODUCTION

Otitismedia (OM) is one of the most common medical problems of childhood. It is the leading cause for office visits, a common reason for prescribing antibiotics, common cause of hearing loss and the most frequent reason that children undergo surgery. The rise in antibiotics use that began in the 1940s and increased throughout the last century dramatically reduced the incidence of complications from chronic otitis media (COM). Nevertheless, complications remain quite frequent, have high morbidity and mortality rates, and pose a challenge to the otorhinolaryngologist. The studies on extracranial complications of otitis media are mostly retrospective; some authors recommend the performance of more rigorous prospective studies on this subject. These complications are caused by progressive erosion of the bone thus increasing the risk of damage to exposed labyrinth, the dura and facial nerve. The advent of antibiotics has softened the blow of complications; however complications still occur, especially in our part of the globe with poor socioeconomic conditions and lack of health awareness. The use of antibiotics modifies the clinical picture of OM and sometimes masks the progression of infection leading to latent complications. Complications are more likely to arise from chronic otitis media, mostly during acute exacerbations. They may be extra-cranial or intra-cranial, and are not mutually exclusive as one may follow the other or co-exist. In our study the various extracranial complications of otitis media will be discussed in detail along with relevant anatomical, physiological and pathological aspects. Stress will be laid on the mode of management of the various complications with emphasis on surgical intervention.

The aims and objectives of this study are as follows:

1. To study the overall incidence of extracranial complications of Otitis Media in patients attending ENT out patient department and those admitted in ENT ward for a period of 2yrs.
2. To study the percentage wise break up of various complications in terms Of age and sex distribution.
3. To study the modes of presentation, symptomatology and functional disabilities in patients presenting with complications.
4. To assess the various modes of management, their efficacy and complications.

MATERIAL AND METHODS

The present study was conducted after obtaining the ethical committee clearance from the Institutional Ethical Committee. The study was done during the period from 1st july 2016 to 30th june 2018 in our Department. In the present study, a total of 50 cases of complications due to otitits media were taken up.The patients were admitted in the ENT Department to undergo investigation and treatment. Their specific particulars were recorded in a special proforma designed for this study. This includes the IP number, name, age, sex, socioeconomic status, occupation and address. An assessment was made of the age and sex incidence. The incidence of the various modes of presentation of the disease and its complications were also noted. The patients below 4 years of age and above 70 years were excluded from the study.

In all cases, a detailed history was taken as outlined in the proforma mentioned below. The patients complaints were recorded in a chronological order. A thorough clinical examination including fistula test, was then performed. The clinical findings were tabulated - both general examination and otorhinolaryngological examination. A fixed scheme of investigations was followed in each case. It included examination of blood, urine and stool, pus for culture and sensitivity, pre- and post- operative Pure tone audiometry after proper

aural toilet and examination under microscope. Radiological assessment of the middle ear, mastoids were done with CT-scan. All findings were recorded.

RESULTS

In the present study, a total of 50 cases were included who had various extracranial complications due to otitis media. All the patients were admitted in the Department of ENT during the period of 1st July 2016 to 30th June 2018.

All the 50 patients were analysed regarding age distribution, sex distribution, socio economic status, type of TM perforation, type of hearing loss, bacteriological distribution, distribution of extracranial complications, types of sub periosteal abcess, findings of CT mastoids in these patients and surgical treatment distribution, operative findings.

Table 1: Age Distribution

	Frequency	**Percentage**
4-15 Yrs	17	34
16-30yrs	15	30
31-45yrs	13	26
46-60yrs	3	6
>60yrs	2	4
Total	**50**	**100**

> Age distribution of the patients ranges from 4 - 70 years with a mean age of 37 years. It is seen that 17 patients belong to the age group of 4 - 15 years, 15 patients between 16 - 30 years, 13 patients between 31 - 45 years, 3 patients between46 - 60 and 2 patients were above 60 years of age.

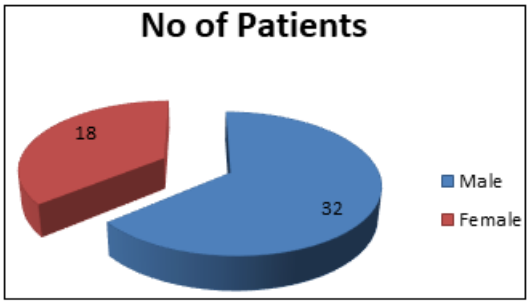

Figure 1: Sex Distribution

> Of the total 50 cases suffering from complications of otitis media, 32 cases were male and 18 cases were female which showed a male: female ratio of 1.7:1.

Table 2: Distribution of Extracranial Complications

Type of complication	**Frequency**	**Percentage**
Mastoiditis	22	44
Abcess	14	28
Sinus/Fistula	7	14
Facial Palsy	4	8
Labyrynthitis	3	6

> The table below shows the incidence of various extra-cranial complications in the study group. All patients were seen to have mastoiditis while it was associated with subperiosteal

abscess in 14 patients (28%), 7 cases (14%) had Post-auricular fistula. 4 cases (8%) of Facial nerve weakness and 3 cases(6%) of Labyrinthitis was observed.22 Patients (44%) had mastoiditis alone as a complication of middle ear infection

Table 3: Surgical Treatment Distribution in Patients with Extra Cranial Complication.

	Frequency	**Percentage**
Canal wall down Mastoidectomy	25	50
Intact canalwall mastoidectomy	16	32
Cortical Mastoidectomy	9	18
Facial nerve decompression	1	1
Incision and drianage	14	28

> Canal wall down mastoidectomy was done in 25 cases (50%), intact canal wall mastoidectomy in 16 cases (32%)and cortical mastoidectomy in 9 cases(18%).

> Abscess drainage was done in all 14 cases (28%) of subperiosteal abscess. Facial nerve decompression was done in 1 patient with facial palsy.

Table 4: Operative findings

Features	**Frequency**	**Percentage**
Sclerotic mastoid	30	60
Soft tissue mass in mastoid Cholesteatoma	25	50
Granulation	14	28
Cholesteatoma+granulation	12	24
Polypoidal tissue	8	16
Erosion of semi circular canal	2	4
Facial canal dehiscence	2	4

>When the otological surgical management was done for the 50 patients with complications, sclerotic mastoid was seen in 30 patients (60%) while the soft tissue mass was also noted in these patients. 25 ears (50%) had cholesteatoma, granulation tissue in 14 ears (28%), cholesteatoma with granulation tissue in 12 patients (24%) while polypoidal mucosa was noted in 8 patients (16%). Erosion of semicircular canal andfacial canal dehiscence were seen in 2 patients (4%)each.

In the post-operative period, of the 50 patients, 4 patients were found to have closure / stenosis of the meatoplasty created during the mastoid surgery. 7 patients were found to have problems relating to cavity like discharge, dizziness during the follow up period.

DISCUSSION

In total the prevalence of complications with CSOM in our study is 1.54%.Many studies have shown a decline in prevalence of these complications which could be explained due to factors like improvement in standard of living and quality of life of the people.Almost all other studies the prevalence rate of complications is about 1-3% except in sitashree et al[1] and Mustafa et al[2] which might be due to longer duration of study and higher sample size which could be the reason for higher prevalence in this studies.

When the sex distribution among the patients was studied, of the total 50 cases suffering from complications of otitis media, two-third of the cases were male and one-third cases were female patients; which showed a male: female ratio of 1.7:1.

Predominant male affection could be explained by probable increased exposure to the outside environment. It may also be the hesitancy of the females to attend clinics that may lead to such pattern of distribution of cases. Discharge (89%) and hearing loss (55.5%) were the most common presenting symptoms. This is similar to the findings of Semple, Mahadevan and Berkowitz [3]

The age distributions of the patients were studied and it was found that majority of the patients, 85% presented between the age group of 4 - 45 years. 9.2% of the patients belonged to the 26 - 40 years age group. The incidence of extracranial complications is least above 60 years of age i.e 2 patients (4%). Majority of studies including the present one, the most common age group observed was between 4-30yrs.however in some other studies there was an inclination towards younger age group <10yrs.This may be due to increased incidence of URTI in that age group due to more horizontal Eustachian tube and decreased immunity in this group compared to adults.

When the regional distribution of the patients was studied, it was found that a vast majority of patients, 80% came from a rural background while 20% came from urban areas.
This higher prevalence in rural population is due to lack of education, lack of understanding to know the seriousness of health conditions and frequent treatment by untrained personnel, while the urbanities have the advantage of getting treatment by specialists with proper antibiotic usage resulting in arrest of disease process.

The lack of infrastructural facilities to deal with such patients in rural areas might be one of the reasons for the large proportion of rural patients to present with complications.
On socio-economic scale, almost 3/4th of the patients, 70% belonged to the lower socioeconomic strata while 26% belonged to middle class and 4% to the upper strata.Poor hygienic conditions coupled with inability to seek and obtain adequate and timely treatment among the poor patients might be the reason for the increased incidence of complications.

When the different extracranial complications were studied, mastoiditis alone as a complication was the most common presentation, seen in 44% of the patients, however, associated mastoiditis was noted in all the patients. Subperiosteal abscess was the next most common extracranial complication seen in 28%.

In a study by *LinYS LinLC LeeFP(2009)*[4] *Mastoiditis* was the most commonly encountered extracranial complication . This is not surprising, given that the most direct pathway of middle ear infection extends posteriorly to the mastoid air cells, and no osseous barriers lie in this pathway. Direct extension of the infection can result in subperiosteal abscess formation. The presence of a fistula from the mastoid air cells to the subperiosteal abscess can help to decompress the middle ear cleft and, in turn, lower the chance of intracranialcomplication

In Rupa and Raman's study[5], postauricular fistula was seen in 7 (7.2%) patients while the incidence in our study is 14%.

According to Sheehy et al[6], the incidence of labyrinthine fistula is around 10% in patients with cholesteatoma. In our study, the patients with cholesteatoma was complicated with Labyrinthitis in 6%. Busaba NY et al[7], noted the most common location for labyrinthine fistula to be the lateral semicircular canal which is in concordance with our study.

When the clinical presentation of the patients with extracranial complications was studied, ear discharge, hearing loss, earache, vertigo, facial deformity and fever were the

most common presenting symptoms. Majority of these patients did not have history of headache, vomiting, vertigo or tinnitus. Aural polyp was seen in 5 cases (9.2%).

All the patients were treated with systemic antibiotics, according to the culture & sensitivity report. Vartiainen E 1995[9], in a series of 349 patients, operated 93% of the patients by the canal wall down technique with successful results. This is similar to our study where, majority of the patients (50%) was treated by a Canal wall down mastoidectomy while the remaining one third of the patients had intact canal mastoidectomy and 18% patients underwent cortical mastoidectomy as a treatment for their presentation.

According to Bluestone and Klein[8], facial decompression is indicated only in cases of total facial paralysis and suspicion of nerve compression. In the present study, one patient of facial nerve paralysis had undergone fallopian canal decompression during the mastoid surgery.

All the patients of abscess had incision and drainage of the pus. Among the patients with mastoiditis, 45.8% of the patients had intact canal wall mastoidectomy while 41.6% had cortical mastoidectomy and the remaining patients underwent canal down mastoidectomy (12.5%).

During the surgical management of the patients with complications, the most common operative finding was the presence of cholesteatoma in 50% of the patients. Granulation was noted in 28% of the patients while a sclerotic mastoid was noted in 60% of the patients. Similar findings were noted in studies by Kangsanarak et al (1993)[10]. Fallopian canal dehiscence, erosion of sinus plate or semicircular canals was found in a minority of the patients.

Of the 50 patients, the long term post-operative complication noted was the cavity related problem seen in 14.8% of the patients while meatal stenosis was noted in 11.11% of the patients.

CONCLUSION

Early diagnosis is the key to minimizing the effects of CSOM complications. The physician should be suspicious of complications when there is fever associated with chronic perforation, increased otorrhea, an inferolaterally displaced pinna, retroorbital pain on the side of an infected ear, vertigo or nystagmus in a patient with an infected ear, facial paralysis on the side of an infected ear, headache or lethargy, papilloedema, meningismus, or focal neurological signs or seizures.

Although the incidence of complications of CSOM has decreased in recent decades, it remains too high. Excessive use and misuse of antibiotic treatments may cause masked presentations, thereby reducing the diagnosis. It is critical that clinicians remain alert for clinical signs and symptoms that may indicate the onset of these potentially serious complications and be prepared to examine patients for the presence of more than one complication.

Though the incidence of intracranial complications has appreciably reduced, the incidenceof extracranial ones is still posing a problem to the otologists. Infections of middle ear cleft are very common in India. 40% of attendance in E.N.T. department of general hospitals consists of cases of infections of middle ear cleft. Contribution towards the treatment of this malady has yet to be achieved to a standard, in developing countries. India being a subcontinent where 80% of the population live in rural areas in the altar of poverty, ignorance, and illiteracy and lag behind in facilities of transport and early specialist advice.

A high index of suspicion is needed; clinicians should be vigilant in looking out for swelling in the mastoid region, facial nerve weakness and neurological symptoms such as

nausea and vomiting. Early treatment with directed antimicrobial therapy, a multidisciplinary surgical approach that includes mastoidectomy, and, if necessary,neurosurgical intervention (e.g. drainage of brain abscess) allow for good outcomes in patients with complications of otitis media.

REFERENCES

1. SitashreeSethy, Krishna Chandra Mallik. "Clinico-Pathological Study of Extracranial Complications of Middle Ear Infections". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 13, March31;Page: 3460-3467, DOI:10.14260/jemds/2014/2306
2. Mustafa A, Heta A, Kastrati B,et al. "Complications of chronic otitis media with cholesteatoma during a 10-year period in Kosovo". Eur Arch Otorhinolaryngol. 2008 Dec;265(12):1477-82 doi: 10.1007/s00405-008-0707-8. Epub 2008 May 14. PMID: 18478242
3. Semple CW, Mahadevan M, Berkowitz RG. Et al "Extensive acquired cholesteatoma in children: when the penny drops". Ann Otol Rhinol Laryngol. 2005 Jul;114(7):539-42 doi: 10.1177/000348940511400708. PMID: 16134350
4. Lin YS,Lin LC,Lee FP et al."The prevalence of chronic otitis media and its complication rates in teenagers and adult patients".Otolaryngol Head Neck surg.2009 Feb;140(2):165-70 doi: 10.1016/j.otohns.2008.10.020.PMID:19201282
5. Rupa V, Raman R. "Chronic suppurative otitis media: complicated versus uncomplicated disease". Acta Otolaryngol. 1991;111(3):530-5 doi: 10.3109/00016489109138379. PMID: 1887779
6. SHEEHYJL,BRACkMANN DE,GRAHAM MD et al ,"cholesteatoma surgery:residual and recurrent disease"A review ON 1024CASES.Ann otol Rhinol Laryngol.1977 jul-aug;86(4 pt 1):451-62 doi:10.1177/000348947708600405.PMID:889222
7. Busaba NY. "Clinical presentation and management of labyrinthine fistula caused by chronic otitis media". Ann Otol Rhinol Laryngol. 1999 May;108(5):435-9 doi: 10.1177/000348949910800503. PMID: 10335702
8. Bluestone CD, Klein JO "Otitis media in infants and children" 3rd ed. Philadelphia PA: WB Saunders Company, 1998,269pp doi:10.1002/ppul.1950050210
9. Vartiainen E. "Factors associated with recurrence of cholesteatoma". J Laryngol Otol. 1995 Jul;109(7):590-2 doi: 10.1017/s0022215100130804. PMID: 7561462
10. Kangsanarak J, Fooanant S, Ruckphaopunt K, Et al " Extracranial and intracranial complications of suppurative otitis media. Report of 102 cases". J Laryngol Otol. 1993 Nov;107(11):999-1004 doi: 10.1017/s0022215100125095. PMID: 8288994.