

Original Research Article

Complications of chronic otitis media and their management: a study at tertiary care centre

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ABSTRACT

Background: Chronic otitis media is a disease associated with complications. Due to ignorance, poor literacy and late presentation the management becomes challenging and difficult. The aim is to find the incidence of complications of COM and their management.

Methods: This is a hospital based observational study carried out on 50 patients with COM admitted in the Department of Otorhinolaryngology of a tertiary care centre during a period of 1 year.

Results: Out of 50 patients, 19 cases of safe COM and 31 of unsafe COM. 31% of safe COM patients had complications with 100% extracranial complication (mastoiditis). 45% of unsafe COM had complications, where most common extracranial complication was mastoiditis and intracranial complication was brain abscess. Complications were more common in the age group of 21-30 years. In all the patients, multiple intravenous antibiotics were given covering gram positive, gram negative and anaerobic organisms. The intracranial complications were initially managed by neurosurgery or neurology followed by disease eradication at source. 2 mortalities were seen in cases with intracranial complication due to late presentation.

Conclusions: The complications of COM still pose a great challenge. Late presentation leads to difficulty in management and consequently higher mortality. This study mainly emphasizes the importance of early diagnosis and prompt treatment to avoid complications.

Keywords: Brain abscess, Chronic otitis media, Facial nerve palsy, Mastoid abscess, Sigmoid sinus thrombosis

INTRODUCTION

Chronic otitis media (COM) describes chronic middle ear disease and is defined as an inflammatory process in the middle ear space that results in long term, or more often, permanent changes in the tympanic membrane including atelectasis, perforation, tympanosclerosis, retraction pocket development or cholesteatoma. Chronic otitis media results from long term Eustachian tube dysfunction with a poorly aerated middle ear space, multiple bouts of

acute otitis media, persistent middle ear infection or other chronic inflammatory stimulus.¹

If not managed in time, chronic otitis media can lead to various complications. Ignorance, poor literacy and late presentation cause management difficult. Chronic otitis media can lead to various intracranial and extracranial complications, in spite of the advent of higher antibiotics. Progressive erosion of the bone exposes labyrinth, the dura and the facial nerve leading to complications.²

Complications of chronic otitis media can be classified into intracranial and extracranial. Intracranial complications are extradural abscess, subdural abscess, brain abscess, lateral sinus thrombophlebitis, meningitis and otitic hydrocephalus. Extracranial complications can further be classified into intratemporal and extratemporal. Intratemporal complications are mastoiditis, petrositis, labyrinthitis and facial nerve paralysis; while extratemporal are post aural abscess, zygomatic abscess, Bezold's abscess, Luc's abscess, Citelli's abscess.^{3,6}

With the advent of antibiotics, rate of complications of chronic otitis media have declined. But life threatening complications are still seen to exist due to the changing virulence and susceptibility of bacteria, the state of individual patient and late presentation.⁴

When water enters into ears or after an episode of upper respiratory tract infection, mostly patients present with painless otorrhoea, which resolves on medical management but recurs again. So most of the cases suffer little due to discharge from ears, thereby delaying definitive management.⁵

Mastoidectomy is the definitive management of all patients with CSOM with cholesteatoma. Or else, cholesteatoma will erode tegmen and cause intracranial complications.⁷

Due to lack of awareness, the possibilities of having extra cranial or intracranial complications are increased. CSOM complications might be fatal if not diagnosed and treated correctly.⁸

The aim of our study was to determine the incidence of complications of safe and unsafe chronic otitis media (COM), warning signs and symptoms and their management.

METHODS

This is a hospital based prospective observational study. A total of 50 patients with chronic otitis media admitted in the Department of Otorhinolaryngology, AMCH, a tertiary care centre from February 2022 to January 2023 were included in the study. The written and informed consent was taken from all patients. The data collected was tabulated in Microsoft Excel worksheet 2010 and computer based analysis done.

Inclusion criteria

Patients diagnosed with chronic otitis media with or without complications irrespective of age and gender were included.

Exclusion criteria

Patients with congenital ear disease, malignant ear pathology were excluded.

The patients were reviewed with regards to history, clinical findings, HRCT temporomastoid and audiology. In cases with signs of intracranial complications, CT brain done and fundoscopy done to rule out papilloedema. MRI brain with MRA and MRV done where indicated. The patients with meningitis and brain abscess were managed initially by neuro-surgeons and neurologists and then underwent mastoid exploration for complete eradication of disease. Cases followed up after 3 weeks, 6 weeks and after 3 months.

RESULTS

There was total of 50 patients during this study, 19 cases of safe COM and 31 cases of unsafe variety. 20 cases (40%) of patients were from tea garden population. Most of the cases were found in age group of 21-30 years (Table 1).

Table 1: Age-wise distribution.

Age group (in years)	No. of cases
0-10	1
11-20	14
21-30	18
31-40	10
41-50	7
>50	0
Total	50

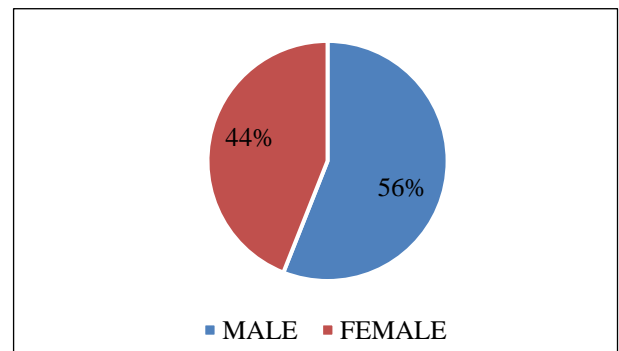


Figure 1: Pie chart representing gender distribution of patients.

The number of cases were higher in males with 56% cases and 44% cases in females. The male to female ratio was 1.27:1 (Table 2).

In this study, 6 patients (31%) of safe COM and 14 patients (45%) of unsafe COM patients showed various complications. The most prevalent intracranial complication was brain abscess, where temporal lobe abscess was most common (3 cases) followed by cerebellar abscess (1 case). The most common extracranial complication was mastoiditis and it was the only complication in safe COM. Out of 14 cases of unsafe COM, 6 cases had only extracranial complications, 4 had only intracranial complications and

rest 4 patients had combination of complications like sigmoid sinus thrombosis with mastoiditis, brain abscess

with mastoiditis and mastoid abscess with facial nerve palsy (Table 3).

Table 2: Types of complications.

Complications	Types of complications	No. of cases	%
Extracranial	Mastoiditis	13	26
	Mastoid abscess	6	12
	Facial nerve palsy	2	4
Intracranial	Brain abscess	4	8
	Sigmoid sinus thrombosis	2	4
	Meningitis	1	2

Table 3: Age distribution of patients (in years) with complications.

Complications	0-10	11-20	21-30	31-40	41-50
Mastoiditis	1	5	4	1	2
Mastoid abscess		4	2		
Facial nerve palsy					2
Sigmoid sinus thrombosis		1	1		
Meningitis		1			
Brain abscess		2	2		

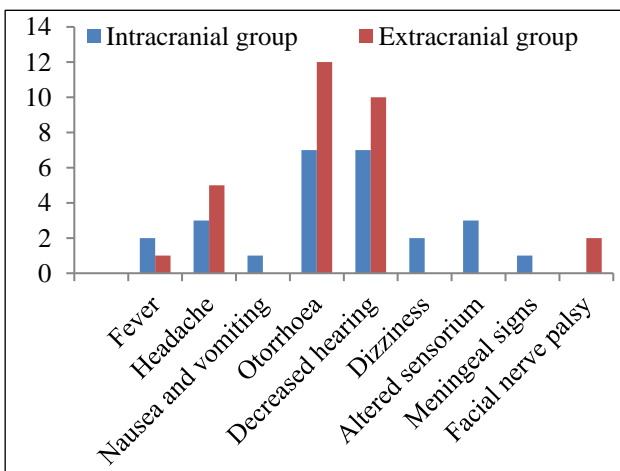


Figure 2: Bar diagram showing common clinical signs and symptoms.



Figure 4: Patient of COM with mastoid abscess with sinus formation.



Figure 3: Patient of com with facial nerve palsy.

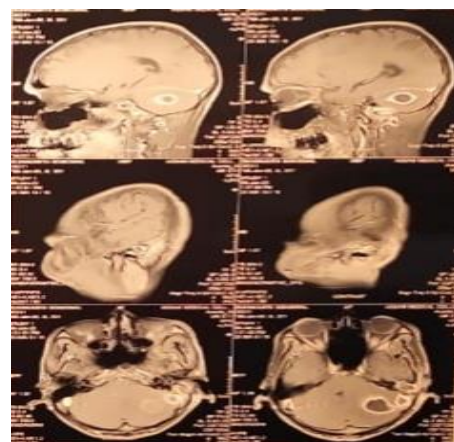


Figure 5: MRI showing left temporal lobe abscess with left sigmoid sinus thrombosis.

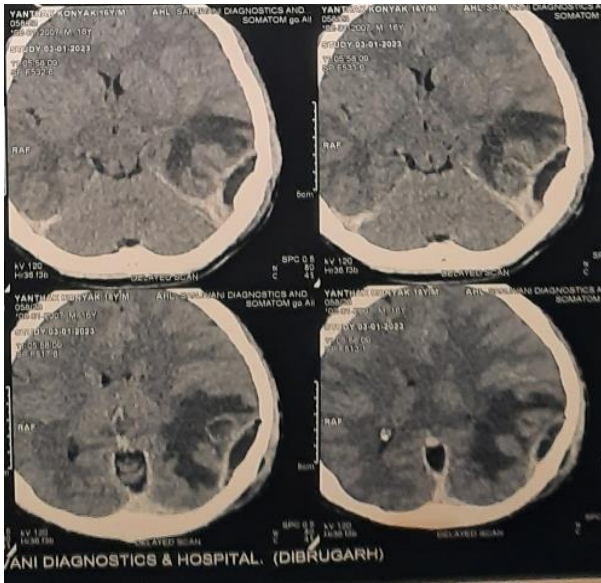


Figure 6: CT brain showing left temporoparietal abscess.

Two deaths occurred in our study, one patient with meningitis and the other with Brain abscess. Morbidity was observed in 9 patients with profound hearing loss and facial nerve palsy.

DISCUSSION

Age and gender distribution

In our study, the patients were in the range of 7-45 years and the most common age group affected was 21-30 years. This was in concordance with a study done by Basak et al where most of the patients were in the age group 21-30 years but in a study done by Mohite et al, most common age group was 35-55 years.^{5,4} The male to female ratio was 1.27:1, which was similar to a study by Basak et al where the male: female ratio was 1.46.⁵ It was also in concordance with to a study by Bento et al and Hussain et al.^{9,10}

Complications

The 50 cases of which 19 cases of safe COM and 31 cases of unsafe variety were taken in our study. Total 20 cases had complications of which 6 patients (31%) of safe COM and 14 patients (45%) of unsafe COM. All 6 cases of safe COM had only mastoiditis as complication. Among the unsafe cases with complications, 4 patients had only intracranial, 6 had only extracranial complications and remaining 4 patients presented with more than 1 complications, in the form of either multiple extracranial complications or a combination of extracranial and intracranial complications. The incidence of complications of unsafe COM was 0.45 whereas in safe COM, incidence of complications was 0.31. In a study done by Borgohain et al 9 out of 25 patients of unsafe COM showed complications in a period of 1 year

and extracranial complications were more common than the intracranial ones as per our study with incidence of complication 0.36.³ Parmar et al 36 out of 250 patients showed complications in a period of 3 years and extracranial complications were more common than the intracranial ones as per our study.⁶

The majority of patients showing complications were in the age group of 11-20 years, which was similar to the study by Parmar et al and Borgohain et al.^{6,3} However, Sharma et al in their study found majority of the patients to be in the age group of 5-10 years, followed by 11-20 years.²

Brain abscess and mastoiditis were the most common intracranial and extracranial complications in our study respectively (Table 2). In the study by Parmar et al meningitis and postauricular abscess were the most common intracranial and extracranial complications respectively.⁶ While in the study of Sharma et al brain abscess was the most common intracranial complication and subperiosteal abscess, the most common extracranial complication.² Yorgancilar et al observed lateral sinus thrombophlebitis as the major intracranial complication.¹⁴

In our study, the most prevalent intracranial complication was brain abscess, where temporal lobe abscess was most common followed by cerebellar abscess. In a study done by Seven et al perisigmoid sinus abscess was more prevalent intracranial abscess followed by cerebellar, epidural, temporal lobe, and occipital abscesses.¹⁵

Clinical presentations

The most common symptoms of the patients were otorrhoea (95%), and decreased hearing (85%). However, patients with complications also presented with headache (40%), fever (15%), dizziness (10%), nausea and vomiting (5%). Altered sensorium (15%) was seen in 2 cases of temporoparietal abscess and 1 case of meningitis. Neck rigidity, Kernig's sign and Brudzinski sign (5%) were seen in 1 case of meningitis and temporoparietal abscess each. Deviation of angle of mouth and incomplete eye closure was seen in 2 cases of lower motor neuron facial nerve palsy (10%).

In a study by Narve et al, otorrhea was present in all patients, followed by hearing loss which is in concordance with our study.⁷ Also in a study by Borgohain et al, the most common symptoms of the patients were otorrhoea (92%), followed by earache (60%) and decreased hearing (48%). Also in other studies done by Mustafa et al, Raju et al, Aslam et al, the most common symptoms were otorrhea, headache, and fever, similar to our findings.¹¹⁻¹³

Treatment

A treatment protocol was followed in our study for every patient. All the patients were treated with multiple high

dose parenteral antibiotics covering gram positive, gram negative and anaerobic organisms before surgery. However, based on culture and sensitivity of aural swab, other antibiotics were used.

The most common complication in EC group was mastoiditis followed by mastoid abscess. All the cases of safe COM with mastoiditis underwent cortical mastoidectomy with type 1 tympanoplasty. The cases of mastoid abscess required premedicated incision and drainage along with IV multiple dose antibiotics followed by mastoidectomy surgery.

In two patients with facial nerve paresis, surgical intervention at the earliest possible was carried out, where radical mastoidectomy was done with decompression by removal of the cholesteatoma matrix over the exposed facial nerve.

The 2 cases of sigmoid sinus thrombosis were managed first conservatively with i.v antibiotics for 3 weeks followed by oral antibiotics for 4 weeks (with consultation from neurology and neurosurgery). Then on second setting, radical mastoidectomy done.

In cases of temporoparietal abscess, at first temporoparietal burr hole aspiration was done by neurosurgeon followed by radical mastoidectomy in the second setting. 1 case of cerebellar extradural abscess, which did not have any cerebellar signs, was managed conservatively followed by mastoid exploration.

In the case of meningitis, lumbar puncture was done carefully to check the status of infection and multiple dose intravenous antibiotics were given before ear surgery until meningitis was under control.

Among the 30 cases without complications, 13 cases of safe COM underwent type 1 tympanoplasty. Rest among unsafe COM cases, 6 cases underwent endoscopic atticotomy with tympanoplasty, 4 cases underwent canal wall down mastoidectomy and 7 cases canal wall up mastoidectomy.

This study has few limitations. In our study period, number of cases were less due to pandemic as people were hesitant to visit hospitals. Moreover, follow-up could be done only for 3 months, as most of the patients did not follow up thereafter.

CONCLUSION

Due to modern antibiotic therapy, early diagnosis based on clinical features, CT scan and culture sensitivity and early intervention as and when required, incidence of complications have declined. However, problems like illiteracy, poor economic status, reluctance to attend health care facility and injudicious use of antibiotics from local drug dispensaries should be addressed and general

population should be made aware to attend nearby health facility at the earliest to avail right treatment at right time.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Assam Medical College and Hospital, Assam

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