



A study on Demographic characteristics and Clinical Spectrum of Complications of CSOM

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Introduction

Chronic otitis media is the inflammatory disorder of middle ear cleft which is characterised by the permanent defect in pars tensa or pars flaccida.¹ Highest incidence of chronic otitis media is seen in developing countries.² Chronic Otitis Media can progress to serious complications if left unattended. Complications are grouped into Intratemporal and Intracranial complications.³ The factors responsible for the progression of disease to complications include virulence of organism, resistance offered by patient, inappropriate use of antibiotic, and antibiotic resistance.² Even though there has been decrease in the incidence of complications due to advent of vaccinations and antibiotics these complications are life threatening and need early recognition and prompt management.⁴ The most common route of spread of complications is bone erosion by the disease process in squamosal COM and via vascular channels in mucosal COM.⁵

Aim & Objectives

- To describe the demographic characteristics and clinical spectrum of Complications of COM

- To identify the role of different management strategies in preventing and managing the complications

Inclusion criteria

- All age group of COM mucosal and squamosal patients presenting with intra and intra temporal complications

Exclusion criteria

- Revision cases

Materials & Methods

Study Design: Retrospective

Study Duration: 2 Years

Sample Size: 100

Study Area: Govt. ENT hospital, Koti, Telangana
Patients of COM were subjected to detailed history taking and ENT examination. Radiological investigations were ordered depending upon the pathology. Neurosurgeons and Neurophysicians opinion was sought as and when required. Consent for the treatment was taken. Medical and surgical management was done based on pathology. Referral to neurosurgeon was done for neurosurgical intervention.

Results

1930 patients of COM presented to tertiary care hospital of which 100 patients had complications.

Of 100 complicated COM cases 44 cases were Active Mucosal and 56 cases were Active Squamosal.

Table 1: Distribution of study population according to Socio – Demographic characteristics

| Age group | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
|-----------------------|-------------------------------|---------------------------------|---------------|
| 0-10 yrs | 7(16%) | 3(5.4%) | 10(10%) |
| 11-30 yrs | 17(38.6%) | 13(23.2%) | 30(30%) |
| 31-60 yrs | 16(36.3%) | 40(71.4%) | 56(56%) |
| >60 yrs | 4(9.1%) | - | 4(4%) |
| Gender | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
| Male | 26(59%) | 34(60.7%) | 60(60%) |
| Female | 18(41%) | 22(39.3%) | 40(40%) |
| Locality | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
| Urban | 11(25%) | 15(26.8%) | 26(26%) |
| Rural | 33(75%) | 41(73.2%) | 74(74%) |
| Socio economic status | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
| Upper | - | 2(3.6%) | 2(2%) |
| Middle | 12(27.3%) | 8(14.3%) | 20(20%) |
| Lower | 32(72.7%) | 46(82.1%) | 78(78%) |

In the present study the maximum incidence of Complicated COM cases were seen in 31 – 60 yrs of age group (56%). In Active Mucosal COM the maximum incidence was seen in 11 – 30 yrs of age group (38.6%) whereas in Active Squamosal COM the maximum incidence was seen in 31 – 60 yrs of age group (71.4%). The male to female ratio in Complicated COM cases were 1.5 : 1. In Active Mucosal COM the male to female ratio

was 1.4 : 1 whereas in Active Squamosal COM it was 1.5:1. The maximum incidence of Complicated COM cases was seen in Rural population (74%), Active Mucosal COM cases accounting to 75% and Active Squamosal COM accounting to 73.2%. Complicated COM cases highest incidence was noted in individuals belonging to low socio economic status (78%) in the present study.

Table 2: Distribution of study population according to Clinical Profile

| Side of ear | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total(100) |
|-------------------------|-------------------------------|---------------------------------|--------------|
| Right | 22(50%) | 22(39.3%) | 44 (44%) |
| Left | 22(50%) | 34(60.7%) | 56(56%) |
| Presenting complaint | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total(100) |
| Otorrhea | 44(100%) | 56(100%) | 100 (100%) |
| Decreased hearing | 44(100%) | 44(78.6%) | 88 (88%) |
| Otalgia | 34(77.3%) | 42(75%) | 76(76%) |
| Dizziness | 1(2.3%) | 4(7.1%) | 5 (5%) |
| Facial weakness | 10(22.7%) | 12(21.4%) | 22 (22%) |
| Swelling behind the ear | 18(40.9%) | 13(23.2%) | 31(31%) |
| Headache | 5(11.4%) | 11(19.6%) | 16 (16%) |
| Vomiting | 6(13.6%) | 13(23.2%) | 19 (19%) |

| | | | |
|----------------------------|--------------------------------------|---------------------------------------|---------------------|
| Fever | 21(47.7%) | 28(50%) | 49 (49%) |
| Childhood ear disease | 21(47.7%) | 15(26.8%) | 36 (36%) |
| Type of perforation | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total(100) |
| Central | 12(27.3%) | - | 12(12%) |
| Sub – total | 29(65.9%) | - | 29(29%) |
| Total | 3(6.8%) | - | 3(3%) |
| Marginal | - | 26(46.4%) | 26(26%) |
| Attic | - | 30(53.6%) | 30(30%) |

In the present study 100% of Complicated COM cases presented with Otorrhea as the main complaint whereas 88% of cases presented with decreased hearing, 76% presented with Otagia and 49% presented with fever. 36% of cases had

childhood ear disease. 53.6% of Active Squamosal COM cases presented with Attic perforation whereas 46.4% of cases presented with Marginal perforation. 65.9% of Active Mucosal COM cases had Sub – Total perforation.

Table 3: Distribution of study population according to Pathology

| Site of complication | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
|--|--------------------------------------|--|----------------------|
| Intratemporal | 39(88.6%) | 45(80.4%) | 84(84%) |
| Intracranial | 5(11.4%) | 11(19.6%) | 16(16%) |
| Intratemporal complications | Active mucosal (Total : 39) | Active squamosal (Total : 45) | Total (84) |
| Acute mastoiditis | 19(48.7%) | 18(40%) | 37(44%) |
| Acute mastoiditis + Post auricular abscess | 6 (15.3%) | 6(13.4%) | 12(14.3%) |
| Acute mastoiditis + Post auricular abscess + Zygomatic abscess | 1(2.6%) | 2(4.4%) | 3(3.6%) |
| Acute mastoiditis + Bezold’s abscess | 1(2.6%) | - | 1(1.2%) |
| Acute mastoiditis + Post auricular abscess + Luc’s abscess | 1(2.6%) | 3(6.7%) | 4(4.7%) |
| Chronic mastoiditis + Post auricular fistula | - | 1 (2.2%) | 1(1.2%) |
| Facial paralysis | 10(25.6%) | 12(26.7%) | 22(26.2%) |
| Acute suppurative labyrinthitis | 1(2.6%) | 2(4.4%) | 3(3.6%) |
| Labyrinthine fistula | - | 1 (2.2%) | 1(1.2%) |
| Petrositis | - | - | - |
| Intracranial complications | Active mucosal (Total : 5) | Active squamosal (Total : 11) | Total (16) |
| Meningitis | 2(40%) | 3(27.3%) | 5(31.25%) |
| Brain abscess | 3 (60%) | 7 (63.6%) (Temporal lobe abscess – 6 , Cerebellar abscess – 1) | 10(62.5%) |
| Lateral sinus thrombophlebitis | - | 1(9.1%) | 1(6.25%) |
| Middle ear pathology | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
| Granulation | 20(45.5%) | 20(35.7%) | 40(40%) |
| Cholesteatoma sac | - | 56(100%) | 56(56%) |
| Polyp | 21(47.7%) | 16(28.6%) | 37(37%) |
| Mucosal edema | 3(6.8%) | - | 3(3%) |

Figure 1: Distribution of study population according to Intratemporal Complications

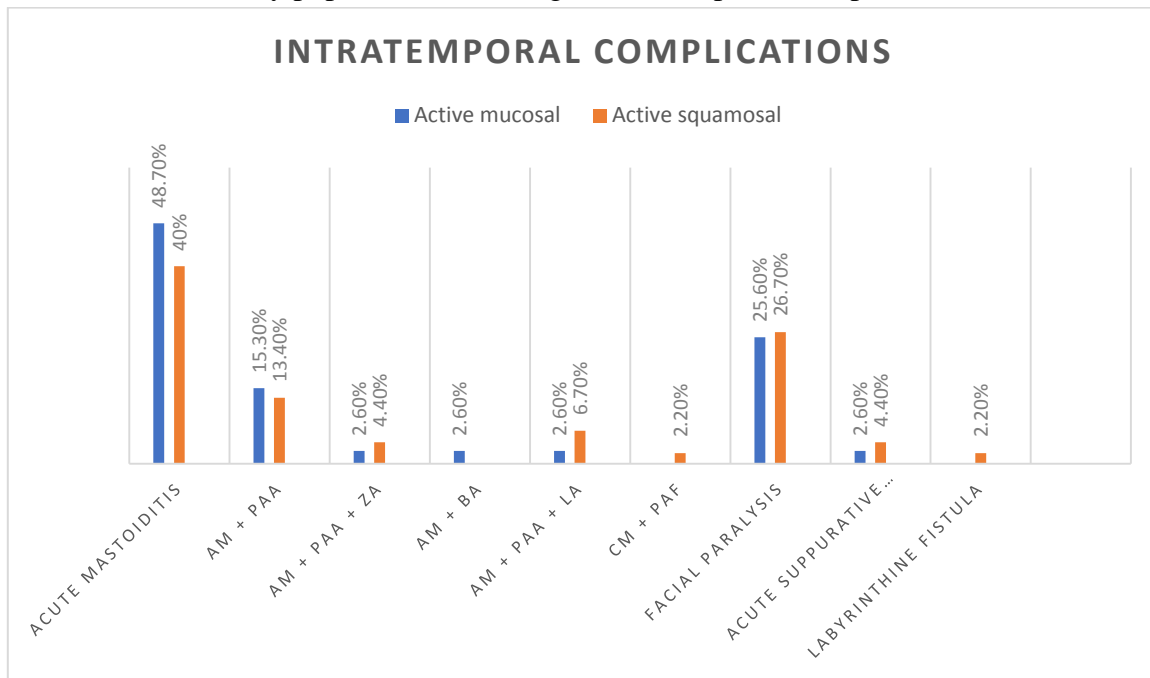
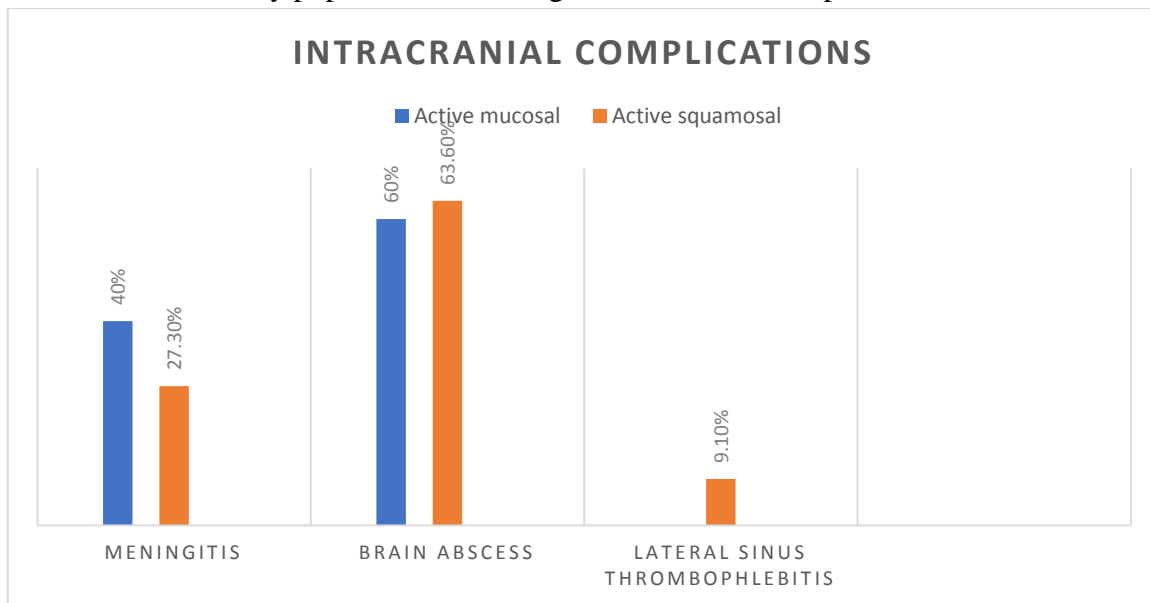


Figure 2: Distribution of study population according to Intracranial Complications



In the present study, the maximum incidence was of Intratemporal complications (84%) whereas Intracranial complications accounted for 16% of cases. In Active Mucosal COM, the incidence of Intratemporal complications was 88.6% and that of Intracranial complications was 11.4%. In Active Squamosal COM, the incidence of Intratemporal complications was 80.4% and that of Intracranial complications was 19.6%. Acute Mastoiditis accounted for highest incidence of Intratemporal Complications (44%) of which 48.7% of cases were noted in Active Mucosal

COM and 40% of cases were noted in Active Squamosal COM. Facial paralysis accounted for second highest incidence of Intratemporal Complications (26.2%) of which 25.6% of cases were noted in Active Mucosal COM and 26.7% of cases were noted in Active Squamosal COM. Brain abscess accounted for highest incidence of Intracranial Complications (62.5%) of which 60% of cases were noted in Active Mucosal COM and 63.6% cases were noted in Active Squamosal COM.

Table 4: Distribution of study population according to Organism cultured from discharge

| Organism isolated on culture | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
|------------------------------|----------------------------------|------------------------------------|---------------|
| No organism isolated | 12 (27.3%) | 34 (60.7%) | 46 (46%) |
| Streptococcus pneumonia | 10 (22.7%) | 5 (8.9%) | 15 (15%) |
| Pseudomonas | 17 (38.7%) | 16 (28.6%) | 33 (33%) |
| E. Coli | 2 (4.5%) | - | 2 (2%) |
| Klebsiella sp. | 1 (2.3%) | 1 (1.8%) | 2 (2%) |
| Proteus sp. | 2 (4.5%) | - | 2 (2%) |

In 46% of cases no organism was isolated on culture (Active Mucosal COM – 27.3%, Active Squamosal COM – 60.7%). In 33% of cases

Pseudomonas was isolated on culture (Active Mucosal COM – 38.7%, Active Squamosal COM – 28.6%).

Table 5: Distribution of study population according to Management and Outcome

| Management | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
|--|----------------------------------|------------------------------------|---------------|
| IV Antibiotics depending upon culture or 3 rd generation cephalosporins | 44(100%) | 56(100%) | 100(100%) |
| Steroids(IV& Oral) | 5(11.4%) | 10(17.9%) | 15(15%) |
| Labyrinthine sedatives | 1(2.3%) | 2(3.6%) | 3(3%) |
| Canal wall up mastoidectomy | 25(56.8%) | - | 25(25%) |
| Surgical drainage & Canal wall up mastoidectomy | 8(18.2%) | - | 8(8%) |
| Canal wall up mastoidectomy with facial nerve decompression | 10(22.7%) | - | 10(10%) |
| Canal wall down mastoidectomy | - | 31(55.4%) | 31(31%) |
| Surgical drainage & Canal wall down mastoidectomy | - | 12(21.4%) | 12(12%) |
| Canal wall down mastoidectomy with facial nerve decompression | - | 12(21.4%) | 12(12%) |
| Canal wall down mastoidectomy with sealing of fistula | - | 1(1.8%) | 1(1%) |
| Canal wall down mastoidectomy with evacuation of clot from sigmoid sinus | - | 1(1.8%) | 1(1%) |
| Craniotomy and drainage of abscess | 3(6.8%) | 7(12.5%) | 10(10%) |
| Outcome | Active mucosal (Total : 44) | Active squamosal (Total : 56) | Total (100) |
| Completely healed & dry ear | 26(59.1%) | 35(62.5%) | 61(61%) |
| Persistent discharge | 18(40.9%) | 21(37.5%) | 39(39%) |

In the present study 100% of cases were treated with IV antibiotics. Active Mucosal Complicated COM cases were managed with Canal Wall Up Mastoidectomy whereas Active Squamosal Complicated COM cases were managed with Canal Wall Down Mastoidectomy. Brain abscess cases were dealt with Neurosurgical intervention before subjecting to Canal Wall Down Mastoidectomy. 61% of Complicated COM cases had better outcome in the form of dry ear whereas in 39% of cases there was persistent discharge.

Discussion

In the present study, 1930 COM cases presented to the Tertiary Care Hospital of which 100 cases had Complications, the Incidence of complications accounting to 5.2%. Of the 100 Complicated COM cases 44% cases were of Active Mucosal COM whereas 56% cases were of Active Squamosal COM. This suggests that the highest incidence of complications were noted in Active Squamosal COM. The age distribution in present study suggests that complications are highest in 31-60 years of age group. In Active Mucosal COM cases Complications were highest in young patients (11 – 30 yrs – 38.6%) whereas in Active

Squamosal COM cases Complications were highest in middle aged patients (31 – 60 yrs – 71.4%). This is in accordance to the Yorgancilar et al study according to which Complications of COM are common in young age and middle aged group.⁶

The gender distribution in present study suggests highest incidence of complications in male gender (60%). This is in accordance to the Mustafa et al⁷ according to which highest incidence of complications is noted in males for reasons unknown.

The majority of patients belonged to Rural area (74%) and Low Socio – Economic status (78%). This is in accordance to Pawar et al study⁸ and Sengupta et al study.⁹

The most common complaint of Complicated COM cases were Otorrhea, decreased hearing, Otagia and fever. This is in accordance to Kangsanarak J et al¹⁰ study according to which most common presenting complaint accounts to Otorrhea and fever. 53.6% of Active Squamosal COM cases presented with Attic perforation whereas 46.4% of cases presented with Marginal perforation. 65.9% of Active Mucosal COM cases had Sub – Total perforation.

Of the 100 Complicated COM cases, Intratemporal Complications accounted to 84% (Active Mucosal COM – 88.6%, Active Squamosal COM – 80.4%) whereas Intracranial Complications accounted to 16% (Active Mucosal COM – 11.4%, Active Squamosal COM – 19.6%). Hence Intratemporal Complications accounted for highest incidence of Complications both in Active Mucosal and Active Squamosal COM cases. This is in accordance to Kangsanarak J et al¹⁰ and Mustafa et al study⁷ according to which Intratemporal Complications are of highest incidence. Acute Mastoiditis (44%) followed by Facial Paralysis (26.2%) accounted for highest incidence of Intratemporal Complications. This is in accordance to Pawar et al⁸ study according to which Acute Mastoiditis is the most common Intratemporal Complication. Whereas Brain abscess (62.5%) accounted for highest incidence

of Intracranial Complications. This is in accordance to Memon et al study.¹¹

No organism was cultured in majority of cases (46%). This is in accordance to Sennaroglu et al¹² study. Pseudomonas (33%) was the organism which was isolated in maximum number of Complicated COM cases.

Majority of Complicated cases of Active Mucosal COM were successfully managed with Canal Wall Up Mastoidectomy (43 cases) whereas majority of Complicated cases of Active Squamosal COM were managed with Canal Wall Down Mastoidectomy (56 cases). The intra – operative findings in majority of cases was Cholesteatoma (56%) followed by Granulations (40%) in present study. This is in accordance to Osma et al study.³

The intra – operative finding in Facial Nerve Paralysis suggested the involvement of Fallopien Canal via Granulation tissue and Cholesteatoma. This is in accordance to Yorgancilar et al study.⁶ The tympanic segment was most commonly involved segment. This is in accordance to Woong et al¹³ study. Brain abscess cases were referred to Neurosurgical Department for intervention before performing Mastoidectomy. 61% of Complicated COM cases had better outcome in the form of dry ear whereas in 39% of cases there was persistent discharge.

Conclusion

There is a decline in the incidence of Complications in COM cases due to advent of antibiotics and vaccination. However when Complications do occur they pose a challenge to Otolaryngologist. Clinical features and Radiology help in pointing towards the diagnosis and ordering further investigations for final diagnosis. Complications require prompt management to prevent mortality and morbidity associated with it.

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