

# Assessment of Complications Associated with Otitis Media in Patients: A Hospital Based Study

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Original

Article

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## ABSTRACT

**Background:** Otitis media is defined as an infection of the middle ear fluid and is the second most common paediatric diagnosis in the emergency department following upper respiratory infections. Hence; we planned the present study to assess the pattern of complications Associated with Otitis Media.

**Materials & Methods:** The present study included evaluation of pattern of complications Associated with Otitis Media. Complete demographic details of all the patients were obtained. A total of 30 cases were included in the present study. We also conducted and evaluated the results of audiological and radiological tests as well as culture and sensitivity tests. We classified the complications of otitis media in two categories; Extracranial (EC) and Intracranial (IC) complications. All the results were recorded and analyzed by SPSS software.

**Results:** A total of 30 patients of otitis media were included in the present study. Mean age of the patients of the present study was 42.5 years. Out of 30, 17 patients were males while the remaining were females. All the patients were divided into two broad groups on the basis of complications; intracranial complications and Extracranial complications. 12 patients exhibited EC complications while 18 patients showed presence of IC complications.

**Conclusion:** Subperiosteal abscess and brain abscess are the most commonly encountered complications in otitis media patients.

**Key words:** Complications, Otitis Media, Paediatric.

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## INTRODUCTION

Otitis media is defined as an infection of the middle ear fluid and is the second most common paediatric diagnosis in the emergency department following upper respiratory infections. Although otitis media can occur at any age, it is most commonly seen between the ages of 6 to 24 months.<sup>[1]</sup> Infection of the middle ear can be due to viral, bacterial or coinfection with both. The most common bacterial organisms causing otitis media are Streptococcus pneumoniae, followed by non-typeable Haemophilus influenzae (NTHi), and Moraxella catarrhalis. Following the introduction of the conjugate pneumococcal vaccines, the pneumococcal organisms have evolved to non-vaccine serotypes. The most common viral pathogens of otitis media include the respiratory syncytial virus (RSV), coronaviruses, influenza

viruses, adenoviruses, human metapneumovirus, and picornaviruses.<sup>[2-5]</sup> Otitis media is diagnosed clinically considering objective findings on physical exam combined with presenting signs and symptoms. Several diagnostic tools are available such as a pneumatic otoscope, tympanometry, and acoustic reflectometry to aid in the diagnosis of otitis media. Pneumatic otoscopy is the most reliable and has a higher sensitivity and specificity as compared to otoscope, tympanometry and other modalities.<sup>[6-8]</sup>

Treatment of otitis media with antibiotics is controversial. Without proper treatment, suppurative fluid from the middle ear can extend to the adjacent anatomical locations and

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result in complications such as TM perforation, mastoiditis, labyrinthitis, petrositis, meningitis, brain abscess, hearing loss, lateral and cavernous sinus thrombosis and others.<sup>8</sup> Under the light of above mentioned data, we planned the present study to assess the pattern of complications Associated with Otitis Media.

### METHODS

The present study was planned in the department of Oto Rhino Laryngology, Govt. S.K. Hospital, Sikar, Rajasthan, India and included evaluation of pattern of complications Associated with Otitis Media.

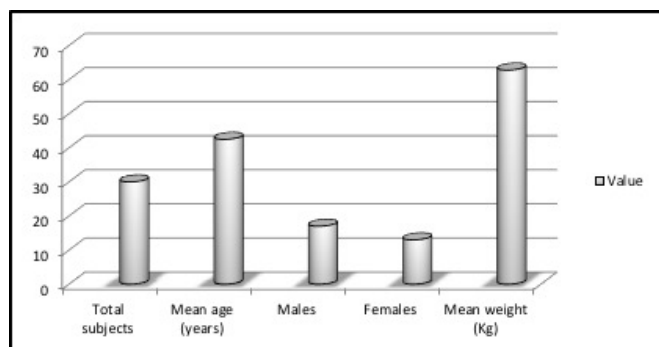
We obtained ethical approval was obtained from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. A total of 30 patients were included in the present study. Inclusion criteria for the present study included:

- Patients with diagnosis of suppurative otitis media,
- Patients with negative history of any other systemic illness,
- Patients who gave consent for the study
- Patients who presented with complications of otitis media

Complete demographic details of all the patients were obtained. We also conducted and evaluated the results of audiological and radiological tests as well as culture and sensitivity tests. We classified the complications of otitis media in two categories; Extracranial (EC) and Intracranial (IC) complications. All the results were recorded and analyzed by SPSS software. Univariate regression curve was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

### RESULTS

A total of 30 patients of otitis media were included in the present study. Mean age of the patients of the present study was 42.5 years. Out of 30, 17 patients were males while the remaining were females. Mean weight of the patients of the present study was 62.8 Kg. All the patients were divided into two broad groups on the basis of complications; intracranial complications and Extracranial complications. 12 patients exhibited EC complications while 18 patients showed presence of IC complications. Subperiosteal abscess was the most common EC complication while brain abscess was the most commonly encountered IC complication.

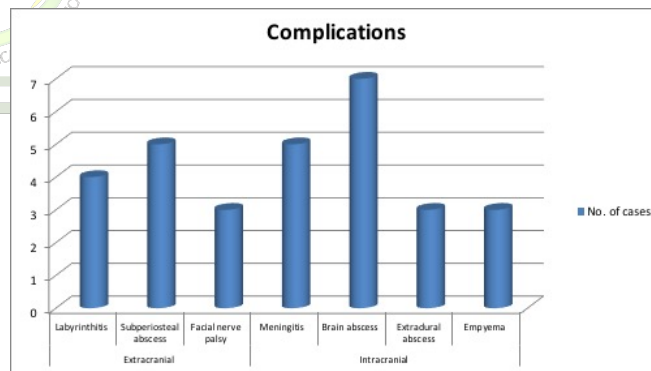


Graph 1: Demographic and clinical details of the patients

### DISCUSSION

12 patients exhibited EC complications while 18 patients showed presence of IC complications. Subperiosteal abscess was the most common EC complication while brain

abscess was the most commonly encountered IC complication. Penido Nde O et al analyzed clinical data and therapeutic options in 33 patients with intracranial involvement resulting from otitis media. Important clinical features of intracranial complications and the sequence of the most efficient therapeutic maneuvers are discussed. Charts of six patients with acute otitis media (AOM) and 27 patients with chronic otitis media (COM) associated with CNS complications were analyzed for clinical presentation, imaging, and therapeutic approach. Ages ranged from 6 months to 79 years, with no gender predilection. Persistent fever, headache, and purulent otorrhea were the main symptoms. *Proteus mirabilis*, *Enterococcus*, and *Pseudomonas aeruginosa* were the most common microorganisms in COM, and *Pneumococcus* and *Haemophilus* were the most common microorganisms in AOM. Nineteen patients (58%) presented with more than 1 CNS complication, resulting in a total of 56 complications, including 26 cases of otogenic brain abscess, 21 cases of meningitis, 5 cases of lateral sinus thromboses, two cases of subdural empyema's, 1 case of epidural empyema, and 1 case of meningocele. Surgical interventions included craniotomy and drainage of the abscess (n = 17), open mastoidectomy with abscess drained through the mastoid (n = 10), open mastoidectomy alone (n = 8), and closed mastoidectomy (n = 2). Twelve patients who underwent craniotomy had subsequent mastoidectomy for recurrent abscess. At the 6-month, 66% of patients presented without sequelae, 24% presented with sequelae, and 9% died. Early identification and prompt clinical and surgical intervention with mandatory drainage of the middle ear (primary disease), was essential for better outcome.<sup>[9]</sup>



Graph 2: Distribution of complications of otitis media

Table 1: Distribution of complications of otitis media

Complications	Types	No. of cases	Total
Extracranial	Labyrinthitis	4	12
	Subperiosteal abscess	5	
	Facial nerve palsy	3	
Intracranial	Meningitis	5	18
	Brain abscess	7	
	Extradural abscess	3	
	Empyema	3	

Leskinen K et al established the incidence, current treatment and outcome of adult patients with acute intratemporal and intracranial complications of otitis media (OM). Adult patients treated for acute intratemporal and intracranial complications of OM over the past 15 years (1990-2004) in the study hospital. Fifty patients aged 16-75 years were treated. The annual age-adjusted incidence of acute intratemporal and

intracranial complications was 0.32/100 000. Forty-one (82%) of the complications were intratemporal and nine (18%) were intracranial. The ear disease behind the acute complication was acute otitis media (AOM) in 80% (40/50), chronic otitis media (COM) in 12% (6/50) and COM with cholesteatoma in 8% (4/50). Mastoiditis was complicated by subperiosteal abscess, labyrinthitis and facial paresis in 7% (3/41), 15% (6/41) and 32% (13/41) respectively. Mastoidectomy was performed on 56% (28/50) of the patients. Four (44%) of the intracranial complications were intracranial abscesses, four (44%) were meningitis and one (11%) was sinus thrombosis. Permanent hearing loss occurred in 13 (26%) patients and one patient died due to otogenic meningitis. Severe complications of the OM in adults are rare in Finland. The commonest cause is AOM rather than COM. Operative treatment is predominantly needed for intracranial complications and intratemporal abscesses. Complications of OM are still associated with considerable morbidity, and early recognition is most likely to form the basis for effective treatment.<sup>[10]</sup> Mattos JL et al reviewf all cases intratemporal and intracranial complications of acute otitis media (AOM) in infants and children from 1998 to 2013. Retrospective chart review of 109 consecutive patients admitted for complications of AOM during a 15-year period at a tertiary-care children's hospital. The main outcomes are: (1) complications of AOM, (2) bacteriology, (3) management strategies. In our population, complications included mastoiditis (86.1%), subperiosteal abscess (38%), facial nerve palsy (16.7%), sigmoid sinus thrombosis (8.3%) and epidural abscess (7.4%). Other complications included post-auricular cellulitis, otic hydrocephalus and elevated intracranial pressure, internal jugular thrombosis, cranial nerve VI palsy and Gradenigo's syndrome, labyrinthine fistula, sensorineural hearing loss, and cerebellar infarct. Sixty-one patients (56%) received antibiotics prior to presentation. Cultures revealed *Streptococcus pneumoniae* in 36 patients (33.3%), other bacteria in 30 patients (27.8%), and "no growth" in 33 patients (30.5%). Nine patients (8.3%) did not undergo culture. Of the patients with *S. pneumoniae*, 20 cultures (55%) were found to be multidrug-resistant.

Eleven patients (10.2%) were treated non-surgically, 31 (31%) were treated with myringotomy and intravenous antibiotics. Forty patients (97.5%) presenting with subperiosteal abscess required mastoid surgery. Thirteen of 18 (72.2%) patients with facial paralysis had full recovery. Eight of 10 (80%) patients with epidural abscess empyema required mastoid surgery and incision and drainage of the abscess Complications of AOM are uncommon, yet continue to have potentially serious consequences. The bacteriology in this population reveals an increasing trend of multi-drug resistant *S. pneumoniae* as the causative organism.<sup>[11]</sup>

## CONCLUSION

From the above results, the authors concluded that Subperiosteal abscess and brain abscess are the most commonly encountered complications in otitis media patients. However, future studies are recommended.

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