

Prevalence of acute otitis media in a tertiary care center of Assam



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ABSTRACT

Background: Otitis media is infection of the middle ear cleft, which comprises acute and chronic otitis media and otitis media with effusion. Acute otitis media (AOM) is the second most prevalent pediatric emergency. **Aims and Objectives:** The aim of the study was to assess the epidemiology and clinical manifestations of AOM cases reported to the ENT OPD. **Materials and Methods:** A retrospective study was conducted in a tertiary care center of Assam from January 2021 to December 2022. A total of 840 patients from a wide range of socioeconomic strata were included in the study who belong to Upper Assam, parts of Arunachal Pradesh and Nagaland region. **Results:** Majority (25.8%) of the patients were below the age of 10 years. The age group of 31–40 years (25.2%) was next in line. In the age range of 71–80 years, the least number of patients (0.3%) were observed. The majority (53.09%) of the patients were from Dibrugarh district of Assam. **Conclusion:** This study has brought to light the prevalence of AOM in this region and the need for the health department to raise public understanding of the significance of a healthy lifestyle in the prevention of AOM, early diagnosis, and treatment.

Key words: Acute otitis media; Chronic otitis media; Otorrhea; Otagia; Prevalence

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INTRODUCTION

Otitis media is infection of the middle ear cleft. Acute otitis media (AOM), chronic otitis media (COM), and otitis media with effusion (OME) fall within this spectrum. Although more common among children, AOM is most frequently reported between the ages of 6 and 24 months.¹

It may occur with or without perforation of the tympanic membrane. Acute inflammation without perforation may present with local and systemic symptoms and signs such as otalgia, otorrhea, fever, irritability, anorexia, vomiting, and diarrhea. Patients may also present with bulging of the tympanic membrane which usually looks opaque and pneumatic otoscopy reveals restricted mobility. AOM with tympanic membrane perforation presents with discharge from the middle ear within 7 days of infection.²

It is obviously more challenging to differentiate between symptoms associated with various bacteria due to the overlapping of symptoms caused by the concurrent viral illness. Furthermore, every child is likely to respond to an AOM episode differently. It is feasible that individual variations in the inflammatory response to viral and bacterial infections could account for a greater diversity in the symptoms and signs of AOM than the various bacteria themselves. The clinical course of the disease may also be impacted by host immunity to the pathogens. Moreover, subjective variations in clinical evaluation among observers lead to increased variation in the data. Because of these aspects, even in large series, potential small clinical variations in AOM cases caused by several pathogenic organisms are easily masked.³

There is a rise in the prevalence of otitis media over the past three decades due to the rising use of day-care centers

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for infants and toddlers. In spite of that, there has been a general trend in the past 10 years to reduce the immediate administration of antibiotics for AOM in children over the age of 2 years in lieu of a “wait and see” strategy.⁴

Aims and objectives

The aim of the study was to assess the epidemiology and clinical manifestations of AOM in patients from the upper Assam region, parts of Arunachal Pradesh and Nagaland.

MATERIALS AND METHODS

From January 2021 to December 2022, this retrospective study was conducted in a tertiary care facility of Assam.

Inclusion criteria

Patients diagnosed with AOM from OPD records.

Exclusion criteria

COM, OME, and AOM with complications were excluded from the study.

From the OPD records, 840 (n) patients diagnosed with AOM attending the ENT outpatient department were included in the study. The data collected were tabulated in a Microsoft Excel Office 2019 worksheet, and the results were expressed as percentages. This study was a retrospective research.

RESULTS

This retrospective hospital-based study, which included 840 patients, found that 443 of the patients were females and 397 were males, with a sex ratio of 0.89:1, as shown in Table 1. Patients were in the age group of 1 month to 80 years. The majority of the patients were seen in the age group within 10 years (25.8%), followed by 31–40 years (25.2%). This study showed that the age distribution had a bimodal peak. According to Table 2, the age range of 71–80 years had the least cases (0.3%).

Furthermore, it was noted that Dibrugarh district had the highest percentage of patients (53.19%), followed by Charaideo district (10.71%) and the Sivsagar district (10.23%) (Figure 1). Hindus comprised 91.8% of cases, whereas Muslims comprised 8.2% cases. 40% and 36.1% of patients, respectively, were from lower class and lower middle class, according to the modified Kuppuswamy scale. The percentage of patients from the upper class was only 1.8% (Table 3). In the rainy season, 44.1% of patients were seen, and the summer season had seen least patients (9%) (Table 4).

The most common complaint among patients in the 0–10-year age group was ear discharge (217 patients),

which was followed by restlessness (210 patients), earache (150 patients), decreased feeding (146 patients), and rhinorrhea (56 patients).

Nearly 56.3% of the patients had perforated tympanic membrane, 31.1% had inflamed and congested tympanic membrane, 11.3% had bulging tympanic membrane, and 1.3% had normal tympanic membrane (Table 5).

DISCUSSION

AOM without perforation is characterized by otalgia, otorrhea, fever, restlessness, headache, and decreased feeding in children and infants. By 7 days of infection, the tympanic membrane perforates in about half of the cases, causing middle ear discharge or otorrhea. The results of this study provide essential information about the risk factors of AOM. We found that 25.8% of the patients in

Table 1: Gender wise distribution of cases

| Gender of patients | Number of patients (percentage of cases) |
|--------------------|--|
| Male | 397 (47.3) |
| Female | 443 (52.7) |
| Total | 840 (100) |

Table 2: Age wise distribution of cases

| Age group (years) | Number of patients (percentage of cases) |
|-------------------|--|
| <10 | 217 (25.8) |
| 11–20 | 124 (14.8) |
| 21–30 | 155 (18.5) |
| 31–40 | 211 (25.2) |
| 41–50 | 92 (10.9) |
| 51–60 | 21 (2.5) |
| 61–70 | 17 (2) |
| 71–80 | 3 (0.3) |
| Total | 840 (100) |

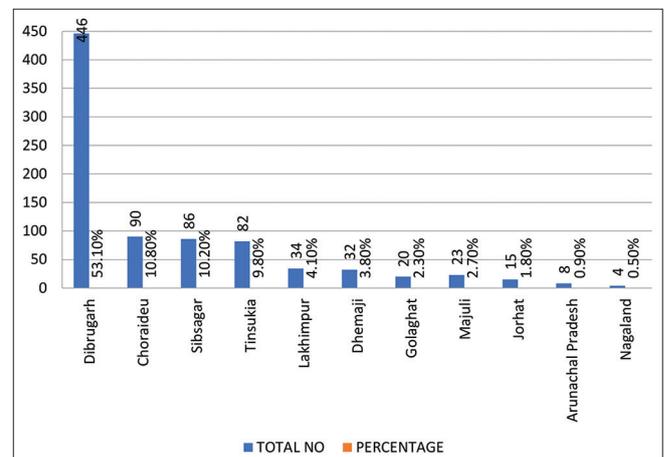


Figure 1: Geographical distribution of cases

Table 3: Socioeconomic status of patients

| Modified Kuppuswamy classification | Number of cases (%) |
|------------------------------------|---------------------|
| Lower class | 336 (40) |
| Lower middle | 303 (36.1) |
| Middle | 134 (15.9) |
| Upper middle | 52 (6.2) |
| Upper | 15 (1.8) |
| Total | 840 (100) |

Table 4: Seasonal variation of cases

| Season | Number of cases (%) |
|--------|---------------------|
| Summer | 76 (9) |
| Rainy | 370 (44.1) |
| Winter | 314 (37.4) |
| Spring | 80 (9.5) |
| Total | 840 (100) |

Table 5: Status of tympanic membrane at the time of presentation

| Status of tympanic membrane | Number of cases (%) |
|-----------------------------|---------------------|
| Normal | 11 (1.3) |
| Perforated | 473 (56.3) |
| Red and inflamed | 261 (31.1) |
| Bulging | 95 (11.3) |
| Total | 840 (100) |

this study were below 10 years. In their study, Khan et al., observed that infants between the ages of 9 and 12 months had the highest prevalence (41.28%) of AOM, probably due to different climates and geographic locations and high populations.⁵

There was a bimodal peak distribution of age in the study, where 25.8% of cases were under the age of 10 years and 25.2% between 31 and 40 years. The age group of 71–80 years (0.3%) had the lowest patient population. School-going children are more likely to develop AOM due to poor ear hygiene and the humid climate of the region. No other study has been found in the literature that mentions the bimodal peak of AOM occurrence, despite the fact that nearly all of them agree that school-aged children have a high prevalence of the disease.

In our study, 52.8% of participants were females and 47.2% were males. Sex ratio of 0.89 suggests a female preponderance of AOM in the region. This finding contrasts with one made by Khan et al., who observed that there were more men (55.02%) than women (44.98%) with AOM.⁵

The majority (53.1%) of patients who visited the ENT OPD at AMCH were from Dibrugarh. Age, gender, the number of family members, economic status, play school, overcrowded housing, genetic factors, season, immunization status, immunological status, infective rhinitis, adenoids,

and allergic rhinitis can all be risk factors for AOM. In this study, AOM was seen in 370 patients (44.1%) during the rainy season, 314 patients (37.4%) during the winter, and 80 (9.5%) and 76 patients (9%) during the spring and summer, respectively. Our research somewhat contradicts Al-Ani result that winter is the season when otitis media is most prevalent.⁶ The variations in our study could be brought about by geographical, environmental, and racial variations. AOM instances can be seen throughout the year in the region due to its consistently humid atmosphere, albeit they are more frequent in the winter and rainy seasons.

Children develop acute infection and inflammation of middle ear cleft more frequently than adults. The favorable positioning of the Eustachian tube and the prevalence of adenoids in children are believed to be responsible. However, in our analysis, a bimodal distribution of the prevalence of AOM was seen, with 25.8% of cases occurring in children under the age of 10 years and 25.2% in people between the ages of 31 and 40 years. These findings stand in contrast to other studies^{7,8} that demonstrate that children are considerably more likely than adults to develop AOM. Yet, they are almost similar to the results of the study conducted by Al-Ani.⁶ The fact that most children in our region visit pediatricians and general practitioners for AOM may account for the disparities in observation between our study and prior studies.

The modified Kuppuswamy scale revealed that 40% and 36.1% of cases, respectively, belonged to the lower and lower middle classes, respectively, supporting the role of inadequate nutrition and cleanliness in the development of AOM. In their study, Ramakrishnan et al., observed that infants and young children frequently experience the symptoms of AOM, such as fever, headache, irritability, cough, rhinitis, listlessness, anorexia, vomiting, diarrhea, and pulling at the ears.⁹ Otolgia is more prevalent in adults and adolescents, whereas it is less common in children under the age of 2 years.⁸ The tympanic membrane is normally convex, mobile, translucent, and intact; the membrane's normal color and mobility rule out otitis media. The most common primary complaint in our study was otorrhea, which was followed by otalgia. 56.3% of patients who presented to our facility had perforated tympanic membrane. It implies a lack of appropriate care in peripheral medical facilities as well as a lack of awareness among parents, teachers, and other caregivers. The lack of accessibility to good ENT setup with ENT specialists and late presentation for proper treatment are ongoing issues in this area.

Limitations of the study

One of the study's limitations was that it did not look into how exposure to allergens, immunization status or the size of the household affected the prevalence of AOM.

CONCLUSION

Being responsible for 10% to 15% of all pediatric medical visits, it continues to be a significant public health burden. The low socioeconomic class, poor lifestyle, lack of public health education, and the humid climate of are all contributing factors to the high incidence of AOM in this region. State health departments must set up mobile health clinics or school health initiatives to regularly screen school-age children, educate parents, and teachers about ear hygiene, nutrition, and the warning signs of AOM and to refer patients to ENT specialists and other appropriate medical facilities as soon as possible. This action will aid in preventing long-term effects of AOM that could potentially affect the patient's life. This study has brought to light the prevalence of disease in this area and the necessity for the health department to educate parents and teachers about the significance of leading a healthy lifestyle in preventing otitis media and ensuring early detection and treatment.

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REFERENCES

1. Meherali S, Campbell A, Hartling L and Scott S. Understanding parents' experiences and information needs on pediatric acute otitis media: A qualitative study. *J Patient Exp.* 2019;6(1):53-61.
2. Kong K and Coates HL. Natural history, definitions, risk factors and burden of otitis media. *Med J Aust.* 2009;191(S9):S39-S43. <https://doi.org/10.5694/j.1326-5377.2009.tb02925.x>
3. Palmu AA, Herva E, Savolainen H, Karma P, Mäkelä PH and Kilpi TM. Association of clinical signs and symptoms with bacterial findings in acute otitis media. *Clin Infect Dis.* 2004;38(2):234-242. <https://doi.org/10.1086/380642>
4. Glasziou PP, Del Mar CB, Sanders SL and Hayem M. Antibiotics for acute otitis media in children. *Cochrane Database Syst Rev.* 2004(1):CD000219. <https://doi.org/10.1002/14651858.CD000219.pub2>
5. Khan TM, Akram J, Muneer F, Ilyas D, Ahmed HM, Khan A, et al. Risk factors of acute otitis media among infants in a tertiary care hospital in Rawalpindi: A descriptive cross-sectional study. *Int J Otorhinolaryngol Head Neck Surg.* 2022;8(9):711-715. <https://doi.org/10.18203/issn.2454-5929.ijohns20222161>
6. Al-Ani R. Prevalence of otitis media among patients attending otorhinolaryngology clinic in Ramadi City/Iraq. *Egypt J Ear Nose Throat Allied Sci.* 2020;21(1):17-21. <https://doi.org/10.21608/ejentas.2019.15103.1136>
7. Halama AR, Voogt GR, Musgrave GM and van der Merwe CA. Prevalence of otitis media in a Venda village. *S Afr Med J.* 1987;71(9):577-579.
8. Miller SA, Omene JA, Bluestone CD and Torkelson DW. A point prevalence of otitis media in a Nigerian village. *Int J Pediatr Otorhinolaryngol.* 1983;5(1):19-29. [https://doi.org/10.1016/s0165-5876\(83\)80004-4](https://doi.org/10.1016/s0165-5876(83)80004-4)
9. Ramakrishnan K, Sparks RA and Berryhill WE. Diagnosis and treatment of otitis media. *Am Fam Physician.* 2007;76(11):1650-1658. Erratum in: *Am Fam Physician.* 2008;78(1):30.

Author's Contribution:

MMK- Definition of intellectual content, concept, literature survey, prepared first draft of manuscript, implementation of study protocol; **ST**- data collection, data analysis design, clinical protocol, manuscript preparation; **MS**- Design of study, statistical Analysis and Interpretation; Review Manuscript; **AS**- editing and manuscript revision, Review Manuscript, preparation of figures, coordination.

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