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Original Research Article

Prevalence of Otitis Media with Effusion in School-Age Children: A Multicentric Retrospective Observational Study

Daya Shankar[1], Prateek Roy[2], Hari Krishn Dwivedi[3]

[1]Assistant Professor, Department of Otorhinolaryngology, KMC Medical College and Hospital Maharajganj, U.P., India

[2]Associate Professor, Department of ENT, HIMS SITAPUR, India

[3]Assistant Professor, Department of ENT, Autonomous State Medical College Gonda U.P., India

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Corresponding Author: Hari Krishn Dwivedi

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Abstract:

Background: Otitis media with effusion (OME) is one of the most frequent causes of hearing difficulty in school-age children, and early identification is important to prevent speech, learning, and behavioral effects.

Objectives: To determine the prevalence of OME among children aged 5–12 years and to identify associated factors.

Methods: A retrospective observational study was conducted across three centers over a 6-month period. Records of children aged 5–12 years who underwent otoscopic and/or tympanometric evaluation were reviewed. OME was diagnosed when a Type B tympanogram or otoscopic evidence of middle-ear effusion without acute inflammation was present.

Results: A total of 150 records were analyzed (78 boys and 72 girls). OME was identified in 34 children, giving a prevalence of 22.7%. OME was more common in the 5–8 year age group (27.5%) compared to the 9–12 year group (17.1%). Bilateral involvement was seen in 52.9% of affected children. Higher frequency of OME was observed among children with allergic rhinitis, recent upper respiratory infection, passive smoke exposure, and adenoid symptoms.

Conclusion: OME is common among school-age children and is more likely in those with allergic and upper airway comorbidities. School-based screening and timely ENT referral may help reduce long-term auditory and academic consequences.

Introduction

Otitis media with effusion (OME) is a condition in which fluid collects in the middle ear cavity without signs of acute infection. It is frequently observed in children because their Eustachian tube is still developing and is less efficient at maintaining middle ear ventilation. The condition often progresses silently, as children may not complain of ear pain or discomfort. As a result, OME may remain undetected for a considerable time unless screening or targeted evaluation is carried out.

OME is recognized as one of the leading causes of temporary hearing impairment in childhood. Even a mild reduction in hearing can interfere with speech recognition, attention, and communication in daily life. During school years, these difficulties may present as poor classroom performance, lack of concentration, or slow response to instructions. Because the symptoms may be subtle, parents and teachers may attribute them to behavioral issues rather than hearing difficulties. This makes routine ear health assessment important in young children.

Several factors have been linked to the development of OME. Enlargement of adenoids, allergic rhinitis, recurrent respiratory infections, and exposure to cigarette smoke are known to influence Eustachian tube function. Seasonal changes and community environments with higher infection transmission rates can also contribute to its occurrence. Diagnosis typically relies on otoscopic findings supported by tympanometry, with a flat (Type B) tympanogram indicating the presence of fluid behind the tympanic membrane.

Understanding the burden of OME in school-age children is important because this is a period when language, social interaction, and academic foundations are actively developing. Establishing local prevalence and identifying associated factors helps in designing practical screening programs and referral pathways. Therefore, the present multicentric retrospective study was undertaken to determine the prevalence of OME in children aged 5 to 12 years and to examine its association with

common clinical and environmental conditions. The findings aim to support early detection and timely intervention in school and clinical settings.

Materials and Methods

Study Design: Multicentric retrospective observational study

Duration: 6 Months.

Study Population: Children aged 5–12 years attending three participating centers for school screening or ENT evaluation.

Sample Size: 150 children.

Diagnosis of OME: Based on either Type B tympanogram or otoscopic evidence of effusion with reduced tympanic membrane mobility and absence of acute infection.

Data Collected: Age, sex, otoscopy findings, tympanometry results, laterality of OME, presence of allergic rhinitis, recent upper respiratory infection (≤4 weeks), passive smoke exposure, and adenoid symptoms.

Results

A total of 150 children aged 5–12 years were included in the study. Of these, 78 (52.0%) were boys and 72 (48.0%) were girls. Otitis media with effusion was identified in 34 children, resulting in an overall prevalence of 22.7%. The majority of OME cases were observed in the 5–8 year age group, where the prevalence was higher compared to children aged 9–12 years.

Bilateral involvement was more common than unilateral disease. Among the 34 children diagnosed with OME, 18 (52.9%) had effusion in both ears, whereas 16 children (47.1%) showed unilateral involvement. Right- and left-ear unilateral involvement was observed equally.

When associated factors were analyzed, children with allergic rhinitis, recent upper respiratory infection, and adenoid-related symptoms showed a higher frequency of OME compared to children without these conditions. Exposure to cigarette smoke in the household was also associated with an increased number of OME cases.

Table 1: Prevalence and Characteristics of OME

Parameter	Total (n=150)	OME Present (n=34)	Percentage
Age Group			
5–8 years (n=80)	80	22	27.5%
9–12 years (n=70)	70	12	17.1%
Sex			
Boys (n=78)	78	20	25.6%
Girls (n=72)	72	14	19.4%
Laterality of OME	34		
Bilateral	—	18	52.9%
Unilateral (Right)	—	8	23.5%
Unilateral (Left)	—	8	23.5%

Table 2: Associated Clinical Factors

Associated Factor	Present (n)	OME Cases (n)	OME Percentage
Allergic rhinitis	45	16	35.6%
Recent URI (≤4 weeks)	40	15	37.5%
Passive smoke exposure	50	15	30.0%
Adenoid symptoms	30	12	40.0%

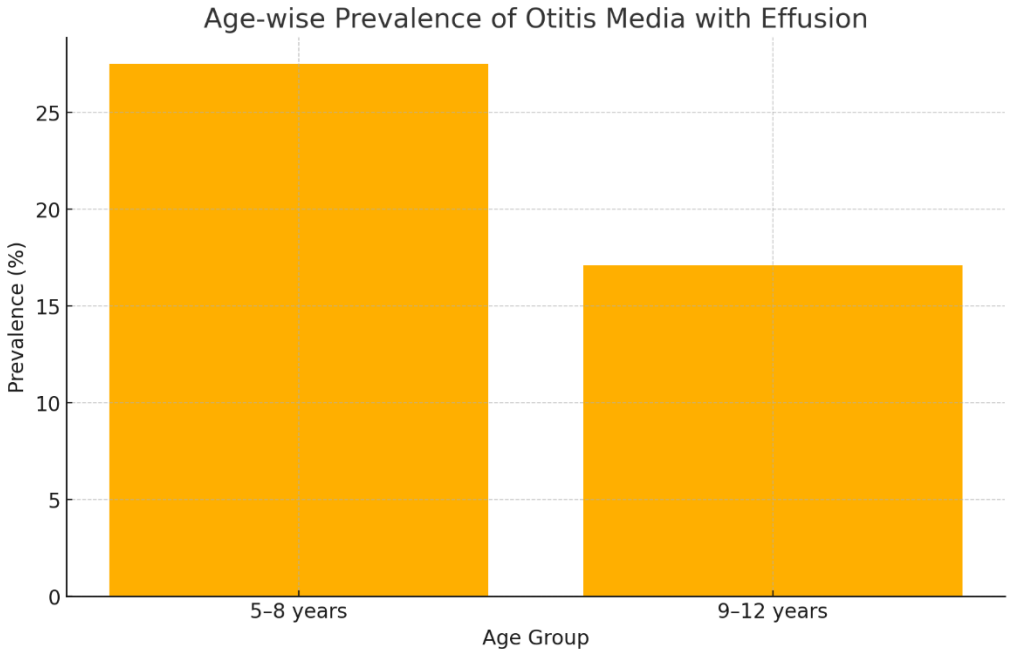

Figure 1: Age-wise Prevalence of OME

Discussion

The present multicentric retrospective study demonstrated that otitis media with effusion (OME) remains a prevalent condition among school-age children, with an overall rate of 22.7% in the evaluated population. This finding indicates that nearly one in four children had evidence of middle-ear effusion during the study period, reflecting a persistent burden within this age group. While prevalence figures vary across regions, the observed rate aligns with studies conducted in primary school settings in India and other developing regions, where similar rates ranging between 18% and 30% have been reported. The consistency of these findings suggests that OME continues to require attention as a public health and educational concern.

A notable observation in this study was the higher prevalence of OME among children aged 5–8 years compared to those aged 9–12 years. This age-related pattern is similar to findings described in large pediatric audiology surveys, where the early school years are recognized as a period of increased susceptibility. The younger age group is often exposed to more frequent respiratory illnesses and classroom contact, factors that may predispose them to transient or recurrent effusion. While developmental anatomy contributes, the practical implication is the need for heightened vigilance and routine monitoring particularly in the early primary school period, where auditory clarity directly influences early learning and speech processing skills.

The study identified a predominance of bilateral involvement among affected children. Bilateral OME carries greater functional significance than unilateral cases, as hearing reduction becomes more persistent and noticeable when both ears are affected. Research has shown that children with bilateral effusion may experience subtle but meaningful delays in auditory discrimination and classroom participation. The present findings reinforce the importance of documenting laterality at each assessment and considering closer follow-up for children with bilateral disease. This also highlights the value of school teachers' observations, as consistent inattentiveness or unclear responses may reflect bilateral hearing reduction rather than behavioural concerns.

Several associated conditions were found to be linked with higher occurrence of OME, including allergic rhinitis, recent upper respiratory infection, exposure to household smoke, and symptoms suggestive of adenoid hypertrophy. These associations have been consistently reported in both clinical and community-based research. Rather than representing isolated risk factors, these conditions reflect mucosal congestion, impaired nasopharyngeal drainage, and ventilation changes affecting the Eustachian tube. The significance of these findings lies in their **clinical recognizability**. Children with persistent nasal obstruction, recurrent colds, or exposure to indoor smoke can be identified early in routine health encounters, providing an opportunity for preventive screening and timely referral to ENT services.

The findings further suggest that preventive strategies for OME do not rely solely on ear-focused interventions. Control of allergic symptoms, management of adenoid-related obstruction, minimizing respiratory infection exposure in school

environments, and advising families regarding smoke-free indoor surroundings are practical approaches that can be implemented in both clinical and community settings. These interventions are comparatively low-cost and have additional benefits for respiratory and sleep health. Thus, the study supports a multi-system perspective in preventing OME, where ear disease is viewed within the context of upper airway function and environmental influences.

The strengths of this study include its multicentric design, which improves the generalizability of the findings across different service settings. The use of consistent diagnostic criteria, including tympanometric confirmation where available, strengthens reliability. The study also incorporated several clinically meaningful associated factors, allowing interpretation beyond simple prevalence reporting. However, certain limitations should be acknowledged. The retrospective design relies on the completeness of existing documentation, and audiometric threshold data were not uniformly available, limiting direct assessment of hearing impact. Additionally, although the study duration captured routine patterns, seasonal effects may still have influenced OME frequency.

Despite these limitations, the study provides relevant implications for school health programs, pediatric care pathways, and public health planning. The findings emphasize the need for periodic ear screening in early school years, especially among children exhibiting risk-related symptoms. Incorporating tympanometry into community screening, even at periodic intervals, could substantially improve detection accuracy. Educating caregivers and teachers to recognize subtle indicators of listening difficulty can help reduce delays in identification. In summary, by documenting prevalence and highlighting associated risk patterns, this study supports targeted, practical strategies aimed at early detection and timely management of OME in school-aged children.

Conclusion

In this multicentric retrospective study of school-age children, otitis media with effusion was identified in nearly one-fourth of the population assessed, indicating a substantial burden during early educational years. The higher prevalence observed in younger children and the notable association with allergic rhinitis, recent upper respiratory infections, passive smoke exposure, and adenoid-related symptoms highlight the influence of upper airway and environmental factors on middle-ear health. Bilateral involvement was frequent among affected children, underscoring the potential for greater functional impact on listening and classroom engagement. These findings emphasize the importance of awareness and early recognition of OME in routine pediatric and school health encounters. Although the retrospective design limits causal inference, the results provide meaningful evidence to support integrated approaches to monitoring ear health in children, with particular attention to those displaying recognizable clinical risk patterns.

References

1. Rosenfeld RM, Shin JJ, Schwartz SR, et al. Clinical Practice Guideline: Otitis Media with Effusion (Update). Otolaryngol Head Neck Surg. 2016;154(1 Suppl):S1-S41.
2. Simon F, Haggard M, Rosenfeld RM, et al. International consensus (ICON) on management of otitis media with effusion in children. Eur Ann Otorhinolaryngol Head Neck Dis. 2018;135(1S):S33-S39.
3. Zielhuis GA, Rach GH, van den Broek P. The prevalence of otitis media with effusion: a critical review of the literature. Clin Otolaryngol Allied Sci. 1990;15(3):283-288.
4. Bluestone CD, Klein JO. Otitis Media in Infants and Children. 4th ed. Hamilton, Ontario: BC Decker; 2007.
5. Tos M. Epidemiology and natural history of secretory otitis. Am J Otol. 1984;5(6):459-462.
6. Fiellau-Nikolajsen M. Tympanometry as a tool in epidemiological studies of secretory otitis media. Acta Otolaryngol. 1984;97(3-4):309-311.
7. Paradise JL, Feldman HM, Campbell TF, et al. Early versus delayed insertion of tympanostomy tubes for persistent otitis media. N Engl J Med. 2001;344(16):1179-1187.
8. Daly KA, Hunter LL, Giebink GS. Chronic otitis media with effusion. Pediatr Rev. 1999;20(3):85-93.
9. Alho OP, Oja H, Koivu M, Sorri M. Risk factors for chronic otitis media with effusion in infancy. Arch Otolaryngol Head Neck Surg. 1995;121(8):884-889.
10. Casselbrant ML, Mandel EM. Epidemiology. In: Rosenfeld RM, Bluestone CD, editors. Evidence-Based Otitis Media. 2nd ed. Hamilton: BC Decker; 2003. p.147-162.
11. Williamson I. Otitis media with effusion. Clin Evid. 2007;2007:0502.
12. Zhang Y, Xu M, Zhang J, et al. Risk factors for chronic and recurrent otitis media–a meta-analysis. PLoS One. 2014;9(1):e86397.
13. Crapo RO, Casaburi R, Coates AL, et al. Guidelines for passive smoking exposure effects in children. Chest. 2000;118(2):286-292.
14. Roberts JE, Rosenfeld RM, Zeisel SA. Otitis media and speech and language: a meta-analysis of prospective studies. Pediatrics. 2004;113(3 Pt 1):e238-e248.

15. Marchisio P, Torretta S, Capaccio P, et al. Clinical insights into adenoid hypertrophy and otitis media. Int J Pediatr Otorhinolaryngol. 2010;74(12):1276-1280.
16. Erdivanli OC, Coskun ZO, Kazikdas KC, Demirci M. Prevalence of otitis media with effusion in school children and risk factors. Int J Pediatr Otorhinolaryngol. 2012;76(11):1701-1705.
17. Zielhuis GA, Straatman H, Rach GH, et al. Analysis of hearing and speech in children with OME. J Pediatr. 1989;114(6):903-908.
18. Berman S. Otitis media in children: epidemiology, risk factors and prevention. Pediatr Infect Dis J. 1995;14(8 Suppl):S32-S36.