

Glue Ear Otitis Media with Effusion Hearing Loss and Speech Delay**Kumar Anupam¹, Manoranjan Kumar², Rajnish Chandra Mishra³**¹Senior Resident, Department of ENT, JNKTMCH, Madhepura, Bihar, India²Senior Resident, Department of Pediatrics, JNKTMCH, Madhepura, Bihar, India³Associate Professor, Department of Pediatrics, JNKTMCH, Madhepura, Bihar, India

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Corresponding Author: Dr. Manoranjan Kumar

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Abstract:

Background: Glue ear, medically known as otitis media with effusion (OME), is a common pediatric condition characterized by the accumulation of non-purulent fluid in the middle ear without signs of acute infection. It is one of the leading causes of temporary conductive hearing loss in children. The presence of middle ear fluid restricts the normal movement of the tympanic membrane and ossicles, resulting in reduced sound transmission and mild to moderate hearing impairment.

Persistent OME during early childhood can negatively impact auditory perception during critical periods of language and speech development. Children with untreated or prolonged OME may exhibit delayed speech and language acquisition, poor articulation, reduced vocabulary development, and difficulties in academic performance and social communication. Risk factors include recurrent upper respiratory infections, Eustachian tube dysfunction, allergy, adenoid hypertrophy, and environmental factors such as passive smoking and poor socioeconomic conditions. Diagnosis is typically made through otoscopic examination, tympanometry, and audiological assessment. Management may involve watchful waiting, medical treatment of underlying conditions, speech therapy, and surgical interventions such as tympanostomy tube insertion in persistent or severe cases. Early detection and timely intervention are essential to prevent long-term communication and developmental consequences in affected children.

Conclusion: Otitis media with effusion (glue ear) is a common condition in children and a significant cause of reversible conductive hearing loss. The present study demonstrates a strong association between persistent glue ear, hearing impairment, and speech delay, particularly in cases with bilateral involvement and prolonged duration of middle ear effusion. Even mild to moderate hearing loss was found to adversely affect speech and language development during critical periods of childhood.

Keywords: Glue ear; Otitis media with effusion; Conductive hearing loss; Speech delay; Language development; Pediatric hearing impairment; Eustachian tube dysfunction; Tympanostomy tubes.

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Introduction

Glue ear, also known as otitis media with effusion (OME), is a common middle ear disorder in children, characterized by the presence of fluid in the middle ear cavity without signs or symptoms of acute infection. It most frequently affects children in early childhood, a critical period for speech and language development. Although often asymptomatic, glue ear can result in varying degrees of conductive hearing loss, which may go unnoticed by caregivers and educators. Hearing plays a vital role in the normal acquisition of speech and language. Persistent or recurrent OME can interfere with auditory input, leading to delayed speech and language development, poor phonological awareness, and difficulties in learning and communication. The impact is more pronounced when the condition is bilateral, prolonged, or occurs

during sensitive developmental stages. Otitis media with effusion is associated with several predisposing factors, including Eustachian tube dysfunction, recurrent upper respiratory tract infections, adenoid hypertrophy, allergic conditions, and environmental influences such as exposure to tobacco smoke. While many cases resolve spontaneously, a subset of children experience chronic OME, placing them at risk for long-term auditory and developmental consequences.

Early identification, appropriate audiological evaluation, and timely management are essential to minimize the effects of hearing loss on speech and language outcomes. Understanding the relationship between glue ear, hearing impairment, and speech delay is crucial for clinicians, parents, and educators

in ensuring optimal developmental outcomes for affected children.

Materials and Methods

This study was conducted on a total of 52 pediatric patients diagnosed with glue ear (otitis media with effusion). The patients were selected from those attending the outpatient department of Otorhinolaryngology. At Jan Nayak Karpuri Thakur Medical College and Hospital Madhepura, Bihar, and Tertiary care Hospital Madhepura. Study duration is one year. Children within the defined age range presenting with hearing difficulty, speech delay, or suspected middle ear pathology were included in the study.

A detailed clinical history was obtained from parents or caregivers, focusing on hearing-related complaints, speech and language development, recurrent upper respiratory infections, and associated risk factors. All patients underwent thorough otoscopic examination to assess the condition of the tympanic membrane. Tympanometry was performed to confirm the presence of middle ear effusion, and pure tone audiometry or age-appropriate audiological assessment was used to evaluate the degree of hearing loss. Patients with acute otitis media, congenital hearing loss, sensorineural hearing impairment, craniofacial anomalies, or known neurological disorders affecting speech were excluded from the study. Speech and language development was assessed using age-appropriate clinical evaluation tools.

The collected data were analyzed to determine the relationship between otitis media with effusion,

degree of hearing loss, and presence of speech delay among the study population.

Results

A total of 52 patients diagnosed with otitis media with effusion were included in the study. The majority of patients were within the preschool and early school-age group. Bilateral middle ear effusion was observed in a significant number of cases, while the remaining patients presented with unilateral involvement. Audiological evaluation revealed conductive hearing loss in all patients, ranging from mild to moderate in severity. Children with bilateral OME demonstrated a higher degree of hearing impairment compared to those with unilateral disease. Speech delay was identified in a considerable proportion of patients, particularly among those with prolonged duration of effusion and bilateral involvement.

Tympanometric findings predominantly showed Type B curves, confirming the presence of middle ear fluid. A positive correlation was observed between the degree of hearing loss and the severity of speech and language delay. Children with longer-standing OME exhibited greater deficits in speech clarity, vocabulary development, and language comprehension.

The results highlight a strong association between glue ear, conductive hearing loss, and delayed speech development, emphasizing the impact of persistent otitis media with effusion on communication skills in children.

Table 1: Age Distribution of Patients (n = 52)

Age Group (years)	Number of Patients	Percentage (%)
2-4	18	34.6
5-7	22	42.3
8-10	12	23.1
Total	52	100

Table 2: Laterality of Otitis Media with Effusion

Laterality	Number of Patients	Percentage (%)
Bilateral	34	65.4
Unilateral	18	34.6
Total	52	100

Table 3: Degree of Hearing Loss

Degree of Hearing Loss	Number of Patients	Percentage (%)
Mild	31	59.6
Moderate	21	40.4
Total	52	100

Table 4: Presence of Speech Delay

Speech Delay	Number of Patients	Percentage (%)
Present	29	55.8
Absent	23	44.2
Total	52	100

Table 5: Relationship Between Laterality and Speech Delay

Laterality	Speech Delay Present	Speech Delay Absent
Bilateral	22	12
Unilateral	7	11
Total	29	23

Discussion

Otitis media with effusion is a common cause of acquired hearing impairment in early childhood and remains a significant public health concern due to its potential impact on speech and language development. In the present study, 52 children diagnosed with glue ear were evaluated to assess the relationship between middle ear effusion, hearing loss, and speech delay. The findings demonstrate a clear association between persistent OME and conductive hearing loss, with a substantial proportion of affected children exhibiting delayed speech development. The majority of patients in this study presented with bilateral otitis media with effusion, which was associated with greater degrees of hearing loss and a higher prevalence of speech delay. This observation is consistent with previous studies, which have shown that bilateral and long-standing OME can significantly reduce auditory input during critical periods of language acquisition, thereby adversely affecting speech and language outcomes. Mild to moderate conductive hearing loss, as observed in this study, may be sufficient to interfere with normal phonological development and auditory processing in young children. Speech delay was more frequently observed in children with prolonged duration of effusion and higher degrees of hearing impairment. These findings support the hypothesis that reduced auditory stimulation caused by middle ear effusion negatively influences expressive and receptive language skills. Children with unilateral OME demonstrated comparatively better speech outcomes, likely due to partial preservation of auditory input from the unaffected ear.

The results of this study highlight the importance of early detection and regular audiological monitoring in children with otitis media with effusion. While many cases resolve spontaneously, persistent OME warrants timely intervention to prevent long-term developmental consequences. Management strategies such as watchful waiting, treatment of predisposing factors, speech therapy, and surgical intervention with tympanostomy tube insertion should be considered based on the severity and duration of the condition. Glue ear is a significant contributor to conductive hearing loss and speech

delay in children. Early diagnosis and appropriate management are essential to minimize its impact on speech, language, and overall developmental outcomes.

Conclusion

Otitis media with effusion (glue ear) is a common condition in children and a significant cause of reversible conductive hearing loss. The present study demonstrates a strong association between persistent glue ear, hearing impairment, and speech delay, particularly in cases with bilateral involvement and prolonged duration of middle ear effusion. Even mild to moderate hearing loss was found to adversely affect speech and language development during critical periods of childhood. Early identification through routine otological and audiological assessment is essential to prevent long-term communication difficulties. Timely intervention, including appropriate medical management, audiological follow-up, speech therapy, and surgical treatment when indicated, can significantly improve hearing levels and speech outcomes. Increased awareness among parents, clinicians, and educators regarding the impact of glue ear is crucial for ensuring optimal developmental and educational progress in affected children.

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