

## ***Original Article***

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# **Otitis media with effusion in Southwestern Region of Saudi Arabia**

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### **Abstract**

*Aim of Study: To determine effectiveness of myringotomy and grommet insertion (MGI) for patients with otitis media with effusion (OME), who failed medical treatment.*

*Methods: A retrospective study was done on 86 patients who underwent MGI for OME between 2005 to 2010.*

*Result: Age of patients ranged from 1 to 12 years, most of them (72%) were less than 6 years old. In children with OME, hearing and academic performance improved after grommet insertion.*

*Conclusion: OME is mainly a disease of preschool age. The leading presenting complaint is hearing loss. MGI is important to be done if medical treatment failed. Hearing threshold improves significantly postoperatively.*

**Keywords:** *Otitis media with effusion; myringotomy and grommet insertion; hearing loss*

### **Introduction**

Otitis media is very common in children, especially between the ages of 1 and 3 years, with a prevalence of 10% to 30% and a cumulative incidence of 80% at the 4 years old. Its incidence decreases with age, so it is uncommon in teenagers (1% at 11 years). It is also more common in cold weather and in boys more than girls, children with cleft palate, Down syndrome, and allergic rhinitis<sup>1</sup>.

Otitis media with effusion (OME) or "glue ear" is defined as middle ear effusion without signs or symptoms of an acute infection as pain, ear discharge, or fever. It may occur spontaneously because of poor Eustachian tube function, or after acute otitis media. Ninety percent of cases resolve spontaneously within 3 months. However, 30% to 40% of children have recurrent OME<sup>2</sup>.

Robb and Williamson<sup>3</sup> noted that OME is the commonest cause of childhood hearing loss. It leads to a conductive hearing loss (HL) of variable severity, hearing impairment, usually noticed by parents, teachers, or discovered at routine screening. Over 80% of OME results in conductive HL, averaging 30 dB HL, ranging from 5 to 50 dB HL. HL is significant, especially if bilateral. It lasts longer than 3 months, with speech delay and learning difficulties in 20%, however, mild otalgia is uncommon (1-2%).

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Most cases of OME present between 1 to 6 years of age. OME can lead to many complications, e.g., HL, delayed speech and language acquisition, altered behavior, erosion of middle ear ossicles, impaired tympanic membrane movement, and negatively impact the quality of life<sup>3</sup>.

Candidates for myringotomy and Grommet insertion (MGI) include children with OME lasting more than 3 months, with persistent HL, recurrent or persistent OME in children at risk regardless of hearing status, like patients with syndromes, and OME with structural damage to the tympanic membrane or middle ear<sup>4</sup>.

The hearing level improves by 6 to 12 dB when tubes are patent. Adenoidectomy is recommended for those who have recurrent OME, unless contraindicated, because adenoidectomy decreases the recurrent rate of OME by 50%<sup>5</sup>. Grommet tube (GT) insertion results in a mean of 62% relative decrease in effusion prevalence<sup>6</sup>.

The aim of this study is to determine the therapeutic effectiveness of MGI for patients with OME, who had failed medical treatment.

## Methods

This was a retrospective study, 86 medical records of children (50 boys and 36 girls) was reviewed, aged 1-12 years, who underwent MGI for chronic OME between January 2005 and December 2010 at Muhayel Private Hospital, Aseer Region, Southwestern of Saudi Arabia.

MGI was done for all children, who had persistent OME in spite of medical treatment (i.e., antibiotics and nasal decongestants) for 3 months or more. Patients' data included: presenting complaints, indications for MGI, ear examination, hearing threshold and tympanometry evaluations. Parents were

asked during the regular visit to the clinic if they felt that hearing and school performance of their child improved after MGI.

Parents or caregivers were asked about specific concerns regarding their child's language development. Delayed speech was diagnosed when no speech was noted by the age of 2 years. For older children, the Denver Developmental Screening Test II was used to screen general development, including speech and language<sup>7</sup>. Comprehensive speech and language evaluation was applied whenever the child's parent or caregiver expresses concern<sup>8</sup>.

The hearing thresholds were determined by pure tone audiometry, tympanometry, or evoked brainstem response. Hearing test was done pre- and post-operatively and showed improvement in all frequencies. Results of follow up visits were recorded at one week, one month, and 6 months regarding audiometry, tympanometry and social interaction (speech and school performance).

This study has been approved by the Research and Ethical Committee at the King Khalid University (REC# 2012-05-01).

## Result

Table I shows that the age of most children included in the present study ranged from 1 to 6 years (62, 72.1%); while the age of 24 children ranged from 7 to 12 years (27.9%). Some predisposing factors were identified in our cases, including tonsillar hypertrophy (38.4%), adenoid hypertrophy (31.4%), while 23.3% of the cases had allergic rhinitis. All these conditions were treated, so as to minimize recurrence. The presenting complaints were mainly decreased hearing loss (74.4%), impaired social interaction (43%), learning difficulty (22.1%), delayed speech (12.8%), or otalgia (2.3%).

**Table I**  
*Characteristics of sample*

Variables	No.	%
Age (years)		
• 1-6 years	62	72.1
• 7-12	24	27.9
Sex		
• Boys	48	55.8
• Girls	38	44.2
Predisposing factors		
• Tonsillar hypertrophy	33	38.4
• Adenoid hypertrophy	27	31.4
• Allergic rhinitis	20	23.3
Presenting complaints*		
• Decreased hearing	64	74.4
• Impaired social interaction	37	43.0
• Impaired learning	15	22.1
• Delayed speech	11	12.8
• Otagia	2	2.3

Patients may present with more than one complaint

Table II shows that postoperatively, most of the children's presenting complaints were significantly managed. The extent of hearing loss significant decreased ( $p < 0.001$ ), with an average postoperative decline of hearing loss

**Table-II**  
*Preoperative and postoperative symptoms of study patients*

Presenting complaints	Preoperatively	Postoperatively	p-value
Hearing loss (dB)	34.7+13.5	23.2+8.6	<0.001
Impaired social interaction	37 (43.0%)	10 (11.6%)	<0.001
Delayed speech	11 (12.8%)	2 (2.3%)	0.010
Learning difficulty	15 (17.4%)	5 (5.8%)	0.018
Otagia	2 (2.3%)	0 (0.0%)	0.156

11.5 dB. Based on parents' observation to their children, there was a significant increase in their social interaction ( $< 0.001$ ), their speech significantly improved ( $p = 0.010$ ), their learning ability significantly increased ( $p = 0.018$ ), while otalgia completely disappeared.

### Discussion

OME affects mainly preschool children, with its peak attacks during the second half of the first year of life<sup>9</sup>. It is characterized by a nonpurulent (i.e., mucoid or serous) effusion<sup>10</sup>. Hearing loss is mainly attributed to fluid in the middle ear or rupture of the tympanic membrane. Prolonged duration of otitis media is associated with ossicular complications, and together with persistent tympanic membrane perforation contributes to the severity of both the disease and the hearing loss<sup>11</sup>. Candidate for GI include children with OME for 3 months or more, recurrent OME, and OME with destruction of middle ear structures<sup>4</sup>.

This study showed that several predisposing factors were associated with OME, i.e., tonsillar hypertrophy, adenoids hypertrophy and allergic rhinitis. Full treatment of these conditions was secured to minimize recurrence of OME. Rovers et al. (2005) noted that OME cases with more than one predisposing factor significantly benefit from treatment with MGI.

Van Balen et al.<sup>12</sup> emphasized that clinicians should determine if there are risk factors that would predispose to undesirable sequelae or predict non-resolution of the effusion. As long as OME persists, the child is at risk for sequelae and must be periodically re-evaluated for factors that would prompt intervention.

Our study revealed that OME occurred mostly in preschool age (72.1%). Hearing loss was

noticed in 74.4%, impaired social interaction in 43%, difficulty in learning in 22.1% and delayed speech in 12.8%. Postoperatively, all these complaints improved significantly, e.g., the extent of hearing loss significantly decreased postoperatively by 11.5 dB. Large significant effects on hearing level occurred among children treated with MGI. The mean hearing level in children treated with MGI significantly improved with about 6 dB after 6 follow up<sup>13</sup>.

Robb and Williamson<sup>3</sup> stated that, after MGI, hearing returns to normal almost immediately. While normal auditory thresholds are the surrogate marker following surgical intervention, improvement in quality of life, social and educational performance are recognized but so far not well measured in trials, and not customary in routine clinical service.

### Conclusion

OME is mainly a disease of preschool age. The leading presenting complaint is hearing loss. MGI is important to be done if medical treatment failed. postoperative hearing threshold improves significantly

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