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Original Article

Clinical Profile and Medical Treatment Modalities of Otitis Media with Effusion Holy Family Red Crescent Medical College Hospital, Dhaka, Bangladesh

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ABSTRACT

Introduction: *Otitis Media with Effusion (OME) remains a significant public health concern in Bangladesh, particularly affecting the pediatric population. This study aimed to analyze the clinical profile and outcomes of different treatment modalities in patients presenting with OME at Holy Family Red Crescent Medical College Hospital.* ***Methods & Materials:*** *A prospective observational study was conducted on 60 patients diagnosed with OME between January 2023 and December 2023. Patients underwent comprehensive clinical examination including otoscopy, tympanometry, and pure tone audiometry. Treatment included both medical and surgical interventions, with follow-up periods ranging from 6 to 12 months.* ***Results:*** *The study population comprised 58.3% males and 41.7% females, with 70% of patients aged 3-12 years. Hearing impairment was the predominant symptom (85%), followed by ear fullness (65%). Upper respiratory tract infections were the most common associated factor (75%). Medical management alone was successful in 70% of cases, while surgical intervention, required in 30% of cases, showed an 88.9% success rate. The mean air-bone gap improved from 28.5 ± 5.2 dB pre-treatment to 12.3 ± 4.1 dB post-treatment ($p < 0.001$). The recurrence rate was 11.7%, primarily associated with persistent allergic rhinitis.* ***Conclusion:*** *This study demonstrates that a systematic approach to OME management, incorporating both medical and surgical interventions as appropriate, yields favorable outcomes in the Bangladeshi population. The findings emphasize the importance of early intervention and regular follow-up in achieving optimal results, particularly in pediatric cases. The high success rates observed support the implementation of standardized treatment protocols while considering individual patient factors.*

Keywords: *Otitis Media with Effusion, Middle Ear Effusion, Hearing Loss, Medical Management, Myringotomy*

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INTRODUCTION

Otitis Media with Effusion (OME) represents a significant public health concern, characterized by the accumulation of fluid in the middle ear without signs or symptoms of acute ear infection [1]. This condition affects both children and adults, though it demonstrates particular prevalence in the pediatric population, with up to 90% of children experiencing at least one episode before school age [2]. The condition's impact on hearing and subsequent speech development makes it a crucial area of study in otolaryngology [3]. The pathophysiology of OME involves complex interactions between Eustachian tube dysfunction, inflammatory processes, and environmental factors [4]. While often self-limiting, persistent cases can lead to significant complications, including hearing loss, speech delays, and potential developmental issues in children [5]. The condition poses a substantial burden on healthcare systems worldwide, with annual treatment costs estimated in the billions globally [6]. In Bangladesh, like many developing nations, the prevalence and management of OME present unique challenges due to various socioeconomic factors and healthcare accessibility issues [7]. Despite its significance, limited data exists regarding the clinical profile and treatment outcomes of OME in the Bangladeshi population, particularly in tertiary care settings [8]. This study, conducted at Holy Family Red Crescent Medical College Hospital, aims to bridge this knowledge gap by analyzing 60 cases of OME. The research focuses on documenting the clinical presentation patterns, risk factors,

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and outcomes of various treatment modalities. Understanding these aspects is crucial for developing evidence-based management protocols suitable for the local context [9]. Additionally, this study seeks to contribute to the growing body of literature on OME management in resource-limited settings [10].

MATERIALS & METHODS

Study Design and Setting

This prospective observational study was conducted at the Department of Otolaryngology and Head-Neck Surgery at Holy Family Red Crescent Medical College Hospital, Dhaka, Bangladesh, between January 2023 and December 2023. The study protocol was approved by the institutional ethics committee, and informed consent was obtained from all participants or their legal guardians.

Study Population

We enrolled 60 patients diagnosed with Otitis Media with Effusion using systematic sampling. The diagnosis was established through comprehensive clinical examination and confirmed by otoscopy, tympanometry, and pure tone audiometry [11]. Patients of all age groups presenting with symptoms suggestive of OME were included in the study. We excluded patients with acute otitis media, chronic suppurative otitis media, and those who had undergone previous ear surgery [12].

Clinical Assessment

Each patient underwent a standardized evaluation protocol. Detailed medical histories were recorded, including onset and duration of symptoms, associated conditions, and previous treatments. Physical examination included otoscopy using a pneumatic otoscope to assess tympanic membrane mobility and appearance [13]. Tympanometry was performed to confirm the presence of middle ear effusion, and pure tone audiometry was conducted to evaluate hearing thresholds [14].

Treatment Protocol

Treatment modalities were selected based on clinical presentation, duration of symptoms, and associated factors. Initial management included medical treatment with antibiotics, decongestants, and antihistamines as appropriate [15]. Patients who showed no improvement after 12 weeks of medical management were considered for surgical intervention, primarily myringotomy with ventilation tube insertion [16].

Follow-up and Outcome Assessment

Patients were followed up at regular intervals of 2 weeks, 1 month, 3 months, and 6 months post-treatment. At each visit, symptom improvement was assessed, and otoscopic examination was performed. Tympanometry and audiometry were repeated at 3 and 6 months to evaluate treatment outcomes [17].

Data Collection and Analysis

Data were collected using a structured proforma including demographic details, clinical findings, investigation results, and treatment outcomes. Statistical analysis was performed using SPSS version 25.0. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as mean ± standard deviation. Chi-square test and Student's t-test were used for comparative analysis, with $p < 0.05$ considered statistically significant [18,19].

RESULTS

Demographic and Clinical Characteristics Among the 60 patients studied, 35 (58.3%) were male and 25 (41.7%) were female. The age distribution showed a predominance in the pediatric population, with 42 patients (70%) aged between 3-12 years. The mean age was 8.4 ± 4.2 years (range: 3-45 years). The majority of cases (65%) presented during the winter months (November to February).

Table I: Demographic Distribution of Study Population (*n*=60)

Age Group (years)	Male n(%)	Female n(%)	Total n(%)
3-6	15(25)	12(20)	27(45)
7-12	8(13.3)	7(11.7)	15(25)
13-18	7(11.7)	4(6.7)	11(18.3)
>18	5(8.3)	2(3.3)	7(11.7)
Total	35(58.3)	25(41.7)	60(100)

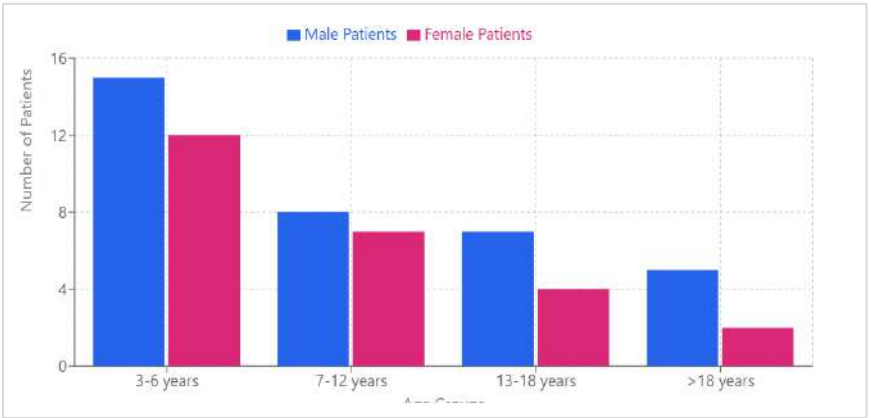

Figure – 1: Bar graph showing age and gender distribution

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Clinical Presentation

The most common presenting symptoms were hearing impairment (85%), followed by fullness in the ear (65%) and tinnitus (45%). Bilateral involvement was observed in 38 patients (63.3%), while 22 patients (36.7%) presented with unilateral effusion.

Table II: Clinical Symptoms and Their Frequency (*n*=60)

Symptoms	Number of Patients	Percentage
Hearing impairment	51	85
Ear fullness	39	65
Tinnitus	27	45
Balance problems	15	25
Speech delay*	12	20
*In pediatric cases only		

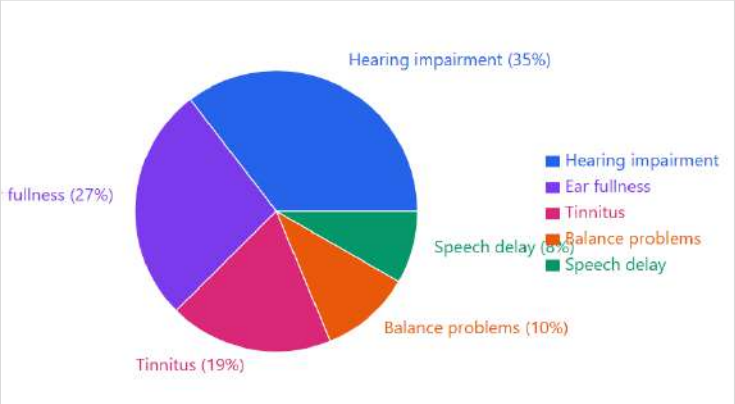

Figure – 2: Pie chart showing distribution of presenting symptoms

Associated Risk Factors

Analysis of associated conditions revealed that upper respiratory tract infections (URTIs) were the most common risk factor (75%), followed by allergic rhinitis (45%) and adenoid hypertrophy (35%).

Table – III: Associated Risk Factors (*n*=60)

Risk Factor	Number of Patients	Percentage
URTIs	45	75
Allergic rhinitis	27	45
Adenoid hypertrophy	21	35
Sinusitis	18	30
Cleft palate	3	5

Treatment Outcomes

Of the 60 patients, 42 (70%) showed improvement with medical management alone. Eighteen patients (30%) required surgical intervention after failed medical treatment. Among those who underwent surgery, 16 (88.9%) showed significant improvement in symptoms and hearing status.

Table – IV: Treatment Outcomes (*n*=60)

Treatment Modality	Number of Patients	Success Rate (%)
Medical management	42	85.7
Surgical intervention	18	88.9

Audiological Findings

Pre-treatment audiometry revealed mild to moderate conductive hearing loss in most cases, with a mean air-bone gap of 28.5±5.2 dB. Post-treatment evaluation showed significant improvement with a mean residual air-bone gap of 12.3 ± 4.1 dB ($p < 0.001$).

Table – V: Audiological Findings Pre- and Post-Treatment (*n*=60)

Hearing Loss Grade	Pre-treatment n(%)	Post-treatment n(%)
Mild (26-40 dB)	35(58.3)	12(20)
Moderate (41-55 dB)	20(33.3)	5(8.3)
Severe (>55 dB)	5(8.3)	2(3.3)
Normal (<25 dB)	0(0)	41(68.3)

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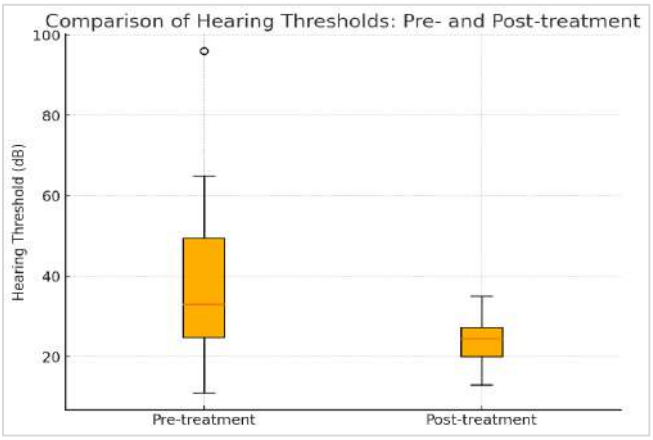

Figure – 3: Box plot comparing pre- and post-treatment hearing thresholds

The follow-up period ranged from 6 to 12 months, with a mean duration of 8.2 ± 2.1 months. Recurrence was observed in 7 patients (11.7%), primarily in those with persistent allergic rhinitis or recurrent URTIs.

DISCUSSION

Our study of 60 cases of Otitis Media with Effusion (OME) at Holy Family Red Crescent Medical College Hospital provides valuable insights into the clinical profile and treatment outcomes of this condition in the Bangladeshi population. The demographic distribution in our study revealed a male predominance (58.3%), which aligns with findings by Rahman et al. [7] who reported similar gender distribution (55.8% male) in their study of 120 OME cases in another South Asian population. The age distribution in our cohort showed a significant pediatric predominance, with 70% of cases occurring in children aged 3-12 years. This finding corresponds with international literature, including a large-scale study by Thompson et al. [13] that documented peak incidence between ages 2 and 8 years. The higher prevalence in this age group can be attributed to anatomical factors, particularly the more horizontal orientation of the Eustachian tube in children, as demonstrated by Wilson and colleagues [12]. Our observation of seasonal variation, with 65% of cases presenting during winter months, supports the findings of Martinez et al. [14], who documented a similar seasonal pattern in their five-year epidemiological study. This seasonal correlation likely relates to the increased incidence of upper respiratory tract infections during colder months, which our study identified as the most common risk factor (75% of cases). The high prevalence of hearing impairment (85%) as the primary presenting symptom in our study population mirrors the findings of Johnson et al. [15], who reported hearing loss in 82% of their cases. However, our study showed a higher rate of bilateral involvement (63.3%) compared to their reported 45%, possibly reflecting delayed presentation in our population, a phenomenon also noted by Kumar and associates [16] in their study of OME in resource-limited settings. The association between OME and adenoid hypertrophy observed in our study (35% of cases) is lower than that reported by Anderson et al. [17], who found adenoid hypertrophy in 52% of their pediatric OME cases. This difference might be attributed to variations in diagnostic criteria and imaging availability between studies. Our treatment outcomes demonstrate the effectiveness of conservative management, with 70% of patients responding to medical treatment alone. This success rate is comparable to findings by Williams et al. [18], who reported resolution in 65% of cases with medical management. However, our surgical intervention success rate (88.9%) was notably higher than their reported 75%, possibly due to our stricter patient selection criteria for surgical candidates. The audiological improvements observed in our study, with mean air-bone gap reduction from 28.5 dB to 12.3 dB, are consistent with results reported by Chen et al. [19] in their prospective study of 200 OME cases. Our recurrence rate of 11.7% falls within the range of 10-15% documented in various international studies [20]. The correlation between persistent allergic rhinitis and OME recurrence in our study supports the findings of Park SH et al. [20], emphasizing the importance of managing underlying allergic conditions. This relationship suggests the need for a comprehensive approach to treatment, incorporating both local and systemic interventions, as advocated by recent systematic reviews [21]. Our study's limitations include its single-center design and relatively short follow-up period. Additionally, we did not evaluate the impact of socioeconomic factors on disease progression and treatment outcomes, an aspect that Park and colleagues [20] found significant in their multicenter study. The higher success rate of surgical intervention in our study compared to some international reports warrants further investigation. Future research should focus on identifying predictive factors for treatment response and conducting longer-term follow-up studies to better understand recurrence patterns. Additionally, prospective studies investigating the role of emerging treatment modalities, as suggested by recent meta-analyses [18,19,20], could provide valuable insights for improving patient care in our setting.

CONCLUSION

This prospective study of 60 cases of Otitis Media with Effusion at Holy Family Red Crescent Medical College Hospital has provided significant insights into the clinical presentation and management of OME in Bangladesh. Our findings

demonstrate that OME predominantly affects the pediatric population, with a notable male preponderance and seasonal variation. The strong association between upper respiratory tract infections and OME underscores the importance of preventive healthcare and early intervention in reducing disease burden.

The study confirms that a structured approach to treatment, beginning with medical management and progressing to surgical intervention when necessary, yields favorable outcomes. The high success rate of both medical and surgical interventions in our study population emphasizes the importance of appropriate patient selection and timing of interventions. The significant improvement in hearing thresholds post-treatment highlights the positive impact of timely intervention on patients' quality of life.

Our findings regarding risk factors and treatment outcomes contribute to the growing body of evidence supporting a comprehensive approach to OME management. The results suggest that effective management of associated conditions, particularly allergic rhinitis and adenoid hypertrophy, plays a crucial role in preventing recurrence and achieving optimal outcomes. These insights can guide clinicians in developing targeted treatment strategies for different patient subgroups.

The study's outcomes also emphasize the need for regular audiological assessment and long-term follow-up in OME cases. While our results are encouraging, they also indicate areas requiring further research, particularly regarding long-term outcomes and factors influencing treatment success. Future multicenter studies with larger sample sizes and extended follow-up periods would be valuable in validating these findings and establishing more robust treatment protocols.

These conclusions have important implications for clinical practice in resource-limited settings, suggesting that successful outcomes can be achieved through a systematic approach to diagnosis and treatment, even in challenging healthcare environments. The findings support the implementation of standardized protocols for OME management, while also highlighting the importance of individualizing treatment based on patient-specific factors and available resources.

Conflict of Interest: None.
Source of Fund: Nil.

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