CLINICAL CHARACTERISTICS OF RECURRENT ACUTE OTITIS MEDIA IN CHILDREN UNDER 6 YEARS AT THE NATIONAL OTORHINORARYNOLOGY HOSPITAL

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ABSTRACT

Objective: To describe the clinical characteristics of recurrent acute otitis media (RAOM) in children under 6 years old at the National Otorhinolaryngology Hospital.

Subjects and Methods: A cross-sectional descriptive study was conducted on children under 6 years of age who were examined and diagnosed with RAOM at the National Otorhinolaryngology Hospital from November 2024 to October 2025. **Results:** The age group from 12 months to 3 years exhibited the highest incidence of the disease (72.1%). The male-to-female ratio was 52.9% to 47.1%. A total of 30 patients (44.1%) experienced three episodes of acute suppurative otitis media within one year. The most common presenting symptoms leading to medical consultation were nasal discharge and productive cough, observed in 18 out of 68 cases (26.5%). The most frequent otoscopic finding in both ears was a bulging tympanic membrane (60.3% in both the right and left ear). Grade III adenoid hypertrophy was predominant, accounting for 43 out of 68 cases (63.2%). All patients had congested nasal mucosa (100%). Thirty-five patients had purulent discharge in the nasal floor (51.5%). Children aged 12 to under 36 months exhibited a wider range and greater frequency of recurrent episodes (3–8 episodes per year). Moreover, children attending daycare had a higher recurrence rate of acute suppurative otitis **Conclusions:** The age group most commonly affected by recurrent acute otitis media in children is 12 months to 3 years. The most frequently observed otoscopic finding is a bulging tympanic membrane, corresponding to the suppurative stage of acute otitis media. There is a statistically significant association between age at disease onset, daycare attendance, with the number of recurrent otitis media episodes.

Keywords: Recurrent acute otitis media (RAOM)

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I. INTRODUCTION

Acute otitis media is an acute inflammation of the middle ear mucosa, with a course lasting less than 4 weeks [1]. According to the AAP 2013, recurrent acute otitis media is defined as at least 3 distinct episodes of AOM in the past 6 months, or at least 4 episodes of AOM in 1 year, with at least 1 episode occurring in the past 6 months [2]. Globally, acute otitis media accounts for 10.85% of cases, meaning 709 million cases each year, with 51% occurring in children under 5 years old [3]. Acute otitis media remains a major health problem, with 83% of children experiencing it at least once, and 46% experiencing it at least 3 times by the age of 3 [4],[5]. In Vietnam, acute otitis media accounts for 3-5% of diseases in children [6]. A study conducted at the National Children's Hospital from October 2021 to December 2023 surveyed 482 children under 5 years old diagnosed with acute suppurative otitis media, of which 70.8% were under 2 years old and 61% had a previous history of otitis media [7]. If detected early and treated properly and promptly, acute otitis media can be completely cured without leaving complications. Conversely, if not treated thoroughly, it can lead to chronic otitis media, affecting hearing, and more severely, to intracranial complications that can be life-threatening.

Acute otitis media is a common disease that can occur at any age but is most frequently seen in children because in children, the Eustachian tube is shorter, wider, and more horizontal compared to adults [8],[9]. Children, particularly those who are not breastfed, have reduced protection due to an underdeveloped immune system. Bacterial infections, immunological issues, anatomical and physiological diseases (such as poor Eustachian tube function, cranial deformities, etc.), and environmental variables (such as visiting daycare or being around tobacco smoke) are all contributing factors to AOM in children [10]. Given this situation, we conducted a research project with the objectives of describing the clinical characteristics of recurrent acute otitis media in children under 6 years old at the National Otorhinolaryngology Hospital and analyzing some factors related to recurrent acute otitis media in children under 6 years old.

II. MATERIALS AND METHODS

Study subject

68 outpatients diagnosed with recurrent acute otitis media at the Outpatient Department and clinical departments of the National Otorhinolaryngology Hospital.

Inclusion criteria

- Patients aged < 6 years. No gender restrictions.

- Patients examined and treated as outpatients at the Outpatient Department and clinical departments of the National Otorhinolaryngology Hospital.

- Confirmed diagnosis of recurrent acute otitis media.

Exclusion criteria

- Patients lacking complete endoscopic examination results.

- The child's family does not consent to participate in the study.

Study time and location

- Study period: From November 2024 to October 2025.

- Study location: National Otorhinolaryngology Hospital.

RESEARCH METHOD

Study design

Cross-sectional study

Sample size

+ Convenience sampling was applied, including all eligible patients who fulfilled the inclusion criteria during the study period.

Data Collection and Processing

Information was collected using a standardized data collection form.

Software used: SPSS 20.0.

The collected data were entered and processed using medical statistical algorithms.

III. RESULTS

Through a study of 68 children under 6 years old diagnosed with recurrent acute otitis media at the National Otorhinolaryngology Hospital from November 2024 to October 2025, we obtained the following results.

3.1. General Characteristics

3.1.1. Age and Sex

Comment: Patients were primarily in the 12 months to <3 years age group (72.1%). The age group from over 3 years to under 6 years accounted for 13.2%.

Among the 68 patients, there were 36 males (52,9%) and 32 females (47,1%).

3.1.2. Number of Previous Episodes of Acute Suppurative Otitis Media Prior to Hospital Visit

Table 1. Distribution of Patients by Number of Previous AOM Episodes

Number of Suppurative AOM Episodes in the Past 12 Months	Number of Patients (n)	Percentage (%)
3	30	44,1
4	21	30,9
5	11	16,2
6	4	5,9
7	1	1,5
8	1	1,5
Total	**68**	**100**

Comment:

Among the total 68 patients, 30 cases (44,1%) had 3 episodes of suppurative AOM in the past year, and 21 cases (30,9%) had 4 episodes. The proportion of patients with ≥5 episodes was lower, including 11 patients with 5 episodes (16,2%), 4 patients with 6 episodes (5,9%), 1 patient with 7

episodes (1,5%), and 1 patient with 8 episodes (1,5%).

3.1.3. Presenting complaints

Table 2. Presenting complaints (n=68)

Presenting complaints	Number of Patients (n)	Percentage (%)
Fever	17	25
Otalgia	10	14,7
Otorrhea	13	19,1
Irritability	3	4,4
Ear picking	7	10,3
Other reasons: nasal discharge, cough	18	26,5

Comment:

Among the 68 patients recorded, the most common reasons for seeking medical care were fever, accounting for 17 cases (25%), and respiratory symptoms such as nasal discharge and cough, with 18 cases (26,5%). In addition, 13 patients (19,1%) presented with otorrhea, and 10 patients (14,7%) sought consultation for otalgia. Less frequent symptoms included ear picking (7 cases with 10,3%) and irritability (3 cases with 4,4%).

3.2.Clinical characteristics

Table 3. Clinical characteristics (n=68)

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Clinical characteristics		Number of Patients (n)	Percentage (%)
Otoscopy Findings		N=68	100%
Right ear	Normal	6	8,8
	Congestion	15	22,1
	Bulging tympanic membrane	41	60,3
	Perforation with purulent discharge	6	8,8
Left ear	Normal	8	11,8
	Congestion	12	17,6
	Bulging tympanic membrane	41	60,3
	Perforation with purulent discharge	7	10,3

Nasal Endoscopy - Adenoid		N=68	100
Nasal Endoscopy Findings	Congested nasal mucosa	68	100
	Pale nasal mucosa	0	0
	Clear secretions in nasal floor	1	1,5
	Mucoid secretions in nasal floor	32	47,1
	Purulent secretions in nasal floor	35	51,5
Adenoid hypertrophy	Grade I	0	0
	Grade II	22	32,4
	Grade III	43	63,2
	Grade IV	3	4,4

Comment:

The most frequently observed otoscopic finding in both ears was a bulging tympanic membrane, accounting for 60,3%. All patients exhibited nasal mucosal congestion. Purulent secretions in the nasal floor were the most common finding (51,5%). Adenoid hypertrophy was predominantly Grade III (63,2%).

3.3. ANALYSIS OF FACTORS ASSOCIATED WITH RECURRENT ACUTE OTITIS MEDIA

Table 4. Association between age and number of acute suppurative otitis media episodes within 12 months (n=68)

Age group	**Number of acute otitis media episodes in the past 12 months**						
	3	4	5	6	7	8	
0 - < 1 month	0	0	0	0	0	0	**P < 0,001**
1 - < 12 months	8	0	2	0	0	0	
12 months - < 3 years	22	16	8	2	1	0	
3 years - < 6 years	0	5	1	2	0	1	

Comment:

In the 12 months to <3 years age group, recurrence most commonly occurred at 3 episodes (22 cases) and 4 episodes (16 cases). In the 1–<12 months group, 8 patients experienced 3 episodes and 2 patients experienced 5 episodes. The 3–<6 years group had fewer recurrences, with 5 patients experiencing 4 episodes. No infants under 1 month were diagnosed with acute otitis media. A significant association was observed between age and the number of recurrent acute otitis media episodes ($p < 0,001$).

Table 5. Association between daycare attendance and recurrent acute otitis media (n=46)

Number of acute otitis media episodes in the past 12 months	**Daycare Start Time (Age in Months)**						
	No Daycare	**<12 months**	**12 - <24 months**	**24 - <36 months**	**36 months - < 6 years**	**Total**	
3	17	3	9	1	0	30	**P=0,001**
4	2	2	15	2	0	21	
5	3	0	6	2	0	11	
6	0	0	1	2	1	4	
7	0	0	1	0	0	1	
8	0	0	1	0	0	1	

Comment: Among the 46 children who attended daycare, recurrence was most common at 3–4 episodes, particularly in those entering daycare at 12–<24 months (9 and 15 cases, respectively). In the non–daycare group (22 children), most experienced only 3 recurrent episodes (17 cases). A statistically significant difference was observed between the two groups ($p = 0,001$).

IV. DISCUSSION

In this study, children aged 12 months to 3 years exhibited the highest rate of recurrent acute otitis media (AOM), accounting for 72,1%, while those aged >3 to <6 years represented 13,2%. These findings are consistent with the study by Do Tung Anh et al. (2024), in which the 6-month to 3-year age group showed the highest incidence at 65,2% [15]. Similarly, Monasta et al. (2012) reported that the highest prevalence of acute otitis media occurred in children aged 1–3 years, accounting for 68%. During the first 6

months of life, infants are protected by maternal IgG antibodies acquired transplacentally and through breast milk. From 6 months onward, IgG levels decline markedly as children begin complementary feeding and have increased exposure to the external environment, while their immune system remains immature. This makes them more susceptible to infectious diseases such as upper respiratory tract infections and acute suppurative otitis media.

In our study, the male to female ratio was 1:1. As a result, the proportion of male patients was slightly higher than that of female patients. This result is similar to Nguyen Huu Hai's findings, which showed that 53.3% of cases involved men. [12].

The biggest percent of patients (44.1%) had three episodes of acute suppurative otitis media annually, whereas 21 patients (30.9%) had four episodes. Fewer patients experienced ≥5 episodes, including 11 patients (16,2%) with five episodes, 4 patients (5,9%) with six episodes, 1 patient (1,5%) with seven episodes, and 1 patient (1,5%) with eight episodes. According to Anne Vergison et al., more than 80% of children experience at least one episode of AOM before the age of three, and 40% will have more than six recurrences by the age of seven [4]. The high incidence and recurrence rates lead to frequent medical visits and increased antibiotic prescriptions, contributing to the growing problem of antimicrobial resistance. This highlights that recurrent AOM is a clinically significant condition with considerable impact on children's health and quality of life.

Nasal discharge and productive cough (26.5%) and fever (25%) were the most frequent causes for seeking medical attention. Every patient in our group had previously had an AOM episode. In previous incidents, parents had taken their kids to neighborhood clinics or district hospitals; but, when upper respiratory tract infection symptoms emerged, parents sought higher-level medical facilities because they were worried about the sickness recurring. Otalgia accounted for 14,7% of presentations, primarily among older children who were able to verbalize their symptoms. The proportion of otalgia in our study is comparable to that reported by Vu Thi Ly (12,7%) and Nguyen Huu Hai (13,3%) [12],[13].

A bulging tympanic membrane was the most prevalent otoscopic feature in acute otitis media, affecting both the left and right ears equally (60,3%). The anatomical similarities between the two sides are responsible for this symmetry. Tympanic membrane bulging is associated with the suppurative stage, which is when systemic and subjective symptoms are most noticeable and when parents typically take their kids to the doctor. Hyperemia of the tympanic membrane was observed in 22,1% of

right ears and 17,6% of left ears. Tympanic membrane perforation with otorrhea was recorded in 12,5% of right ears and 10,3% of left ears. These findings are comparable to those reported by Vu Thi Ly, where bulging of the tympanic membrane was observed in 71,8% of right ears and 66,2% of left ears, and otorrhea was noted in 16,9% of right ears and 16,2% of left ears [13].

All patients exhibited erythematous nasal mucosa on nasal endoscopy (100%). Purulent secretions in the nasal floor were present in 51,5% of cases, while mucoid secretions were observed in 47,1%.

Adenoid endoscopy occurred on 68 patients; none had Grade I hypertrophy, 32.4% had Grade II, 63.2% had Grade III, and 4.4% had Grade IV hypertrophy. With Grade I at 10.8%, Grade II at 37.8%, Grade III at 43.2%, and Grade IV at 8.1%, these results are similar to those published by Hoang Sy Quy [14]. Adenoid hypertrophy was therefore primarily found in Grades II and III. Adenoidal hypertrophy, which can cause consequences like Eustachian tube dysfunction and recurrent acute suppurative otitis media, might result from repeated inflammation.

In our study, the age group with the highest proportion of cases was 12 months to <3 years (72,1%). Table 4 demonstrates a statistically significant association between age and the number of recurrences ($p < 0,001$). Children aged 12–<36 months not only represented the majority of the study population but also exhibited a broader and higher number of recurrent episodes (ranging from 3 to 8 episodes per year). An immature immune system, in combination with a short and horizontal Eustachian tube and increased exposure to pathogens (particularly upon entering daycare), contributes to the onset and continual recurrence of disease. Our findings reinforce that young age is the most critical risk factor for recurrent acute otitis media.

The results presented in Table 5 show a strong statistically significant association between daycare attendance and recurrent acute otitis media ($p = 0,001$). Among the 46 children attending daycare, 15 children (32,6%) in the 12–<24-month age group experienced up to four episodes per year, and many had between five and eight episodes. In contrast, among the 22 children who did not attend daycare, the majority (17

children, 77,3%) experienced only three episodes per year, and none had more than five episodes. Daycare environments concentrate large numbers of young children, creating ideal conditions for the transmission of respiratory pathogens (viral and bacterial). Each episode of upper respiratory infection may lead to acute otitis media by inducing edema and obstruction of the Eustachian tube. Children attending daycare are therefore exposed to a continuous cycle of infections, resulting in frequent recurrences of acute otitis media.

V. CONCLUSIONS

5.1. Clinical characteristics of recurrent acute otitis media in children under 6 years of age

The highest illness prevalence (72.1%) was seen in the age range of 12 months to 3 years. Males were slightly more impacted than females, with a male-to-female ratio of 52.9% to 47.1%. Cough and rhinorrhea were the most common presenting symptoms, making up 26.5% of consultations.

The majority of patients (44.1% of the group) had three recurring bouts of acute otitis media annually. The most frequent result of endoscopic testing was bulging tympanic membranes in both ears (60.3%). 51.5% of patients had mucopurulent discharge on the nasal floor or meatus, and nasal endoscopy demonstrated widespread mucosal congestion. Furthermore, 63.2% of cases had grade III adenoid hypertrophy.

5.2. Factors associated with recurrent acute otitis media in children under 6 years of age

Children aged 12 to <36 months exhibited a broader distribution and higher frequency of recurrences, ranging from 3 to 8 episodes per year. The frequency of recurrent episodes was shown to be strongly and statistically significantly correlated with daycare attendance; children who attended daycare had significantly more recurrent AOM occurrences than children who did not.

Implications

These findings highlight the need for targeted counseling for parents of children within highly susceptible age groups (particularly those aged 12–36 months) regarding the heightened risk of recurrent acute otitis media, especially in the context of daycare attendance. Reinforcement of stringent infection-control measures—such as hand hygiene, routine cleaning of shared items, and isolation of symptomatic children—should be prioritized in both daycare settings and home environments.

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