Analysis Risk Factors For Acute Otitis Media Patients at ENT Clinic Malang Muhammadiyah University General Hospital

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Abstract

Acute Otitis Media (AOM) is a common disease worldwide, including in low-income and developing countries such as Indonesia. The incidence of AOM varies among countries. Indonesia is ranked fourth in Southeast Asia with the highest prevalence of ear disease at 4.6%. To determine the risk factors for AOM and the relationship between each risk factor in patients at the Ear Nose Throat (ENT) clinic of Malang Muhammadiyah University General Hospital (MMUGH). This study used a descriptive analytic method with a cross sectional study approach. The study was conducted from March to June 2024. Risk factors for AOM in includes gender, age, history of allergies, Acute Respiratory Infection (ARI), cigarette exposure, pollution exposure, and family history. Pollution exposure was the most dominant risk factor for AOM.

Keywords: Acute otitis media, ENT clinic, Risk factors

INTRODUCTION

Inflammation of the middle ear mucosa that can occur at any age is known as acute otitis media (AOM). Bacteria or viruses are the cause of this inflammation, infecting the upper canal and irritating the eustachian tube. If not treated promptly, AOM can lead to hearing loss. As a result of this, the patient's quality of life will be disrupted[1].

Acute Otitis Media is a common disease worldwide, including in low-income and developing countries such as Indonesia. The incidence of AOM varies among countries. Indonesia is ranked fourth in Southeast Asia with the highest prevalence of ear diseases with a percentage of 4.6%[2].

In an epidemiological study conducted at the ENT clinic of Ragab Begawe Caram Mesuji Hospital, Lampung from January 2018 to December 2020. Acute otitis media was found to be the third most visited disease with a total of 290 patients, after cerumen disease and otitis externa[3]. Meanwhile, study at ENT-Head and Neck Diseases outpatients in Bangladesh, shows AOM was the third most common disease[4].

Some developed countries say that AOM is a common reason for treatment and this infection often occurs in young children, but AOM can also occur in adulthood. The number of AOM cases varies from country to country. Risk factors for Otitis Media are basically infectious diseases caused by bacterial and viral infections that occur in places where the host's immune system fights the infection. The main factors that influence the risk of Otitis Media occurrence can come from host factors or environmental factors[5].

Based on the above background and the absence of further research on AOM in East Java, especially in Malang City, we conducted a study on the AOM's risk at the ENT clinic of Malang Muhammadiyah University General Hospital (MMUGH).

METHODS

This study used analytic observational with cross sectional method. This research was conducted at the ENT clinic of MMUGH in April-June 2024. Based on the research, 35 respondents were obtained who met the inclusion and exclusion criteria. Data were obtained from primary data, namely the results of filling out questionnaires. This study used univariate and bivariate data analysis. Univariate analysis is presented in the form of data for the distribution of data on variables. Bivariate analysis that presents the relationship between risk factors and the incidence of acute otitis media using the Chi Square test.

RESULTS

Table 1. Characteristics of Respondents

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	23	65.7
	Female	12	34.3
Age	<5 years	12	34.3
	5-18 years	11	31.4
	>18 years	12	34.3

Based on table 1, shows that the majority of respondents are male 65.7% and the highest age range are under 5 years so does more than 18 years 34.3%.

Table 2. Distribution of Risk Factors

Risk Factor		Frequency	Percentage (%)
ARI	Yes	20	57.1
	No	15	42.9
Allergies	Yes	23	65.7
	No	12	34.3
Active Smoker	Yes	13	37.1
	No	22	62.9
Cigarette exposure	Yes	15	42.9
	No	20	57.1
Pollution exposure	Yes	24	68.6
	No	11	31.4
Family history	Yes	20	57.1
	No	15	42.9

ARI: Acute Respiratory Infection

From table 2, it is obtained that the risk factor of pollution exposure has the highest percentage about 68.6%.

DISCUSSION

This study used a descriptive analytic method and a questionnaire to collect data from 35 ENT outpatients at MMUGH. The study found that there was a higher percentage of male patients (65.7%) compared to female patients (34.4%). This finding is consistent with a previous study at Abdul Moeloek Bandar Lampung Hospital, which reported similar percentages of male (58.7%) and female (41.3%) patients[6]. The study suggests that the higher number of men is likely due to factors such as underdeveloped mastoid pneumatization, pollution exposure, repeated airway infections, and trauma, which are more prevalent in males.

The research found that the number of adult respondents with ages under five years was similar. However, this may be due to the limited sample size, which means that the results may not reflect the actual prevalence in the general population. Another study conducted at Abdul Moeloek Regional General Hospital also found a similar pattern, with more than 50% subject was adult patients suffering from acute otitis media[7]. Acute otitis media seems to occur significantly more often in males than in females. It is similiar to other study that show more than 50% patient was male[8]. Another study conducted in Kerbala, Iraq, with a total of 100 participants, found that 64 were male and 36 were female[9].

A study was conducted on 35 individuals, 23 of whom had a history of allergies. The results showed relationship between allergies and the development of allergic rhinitis. These findings were consistent with a previous study conducted at Dr. H. Abdul Moeloek Bandar Lampung Hospital[7], which also found a correlation between exposure to allergens and allergic rhinitis. Allergic rhinitis is considered to be one of the manifestations of allergic reactions in the upper respiratory tract, and it can contribute to the development of otitis media specifically Otitis Media with Effusion (OME). Excess fluid produced in the respiratory tract during allergic reactions can enter the middle ear through the inflamed Eustachian tube, leading to fluid accumulation and subsequent infection or inflammation[10].

Incidence of AOM in ARI cases typically occurs between day 3 and day 8 after exposure to ARI. Repeated episodes of ARI increase the risk of AOM recurrence. A study conducted at Haji Adam Malik Hospital found that 73.8% of respondents with ARI were positive for AOM. This suggests a relationship between ARI and the incidence of AOM, which ARI causes nasopharyngitis thus leading to dysfunction of the eustachian tube and the spread of infection to the ear, resulting in negative pressure within the middle ear[11,12].

Exposure to cigarette smoke is a major risk factor for AOM (middle ear infection) due to its negative effects on the respiratory system, eustachian tube function, and the immune system. Cigarette smoke irritates and inflames the respiratory tract, increasing the risk of infection and aggravating existing middle ear conditions. Avoiding cigarette smoke exposure is crucial for preventing acute otitis media. Research has shown that 15 participants (42.9%) in a study had risk factors for cigarette smoke exposure, indicating a significant association between smoke exposure and the incidence of AOM. This finding aligns with other study which found that both direct and secondhand smoke exposure were associated with the occurrence of AOM. The relationship between cigarette smoke exposure and AOM in this study indicating a significant relationship. Active smokers were found to have a 1.18 to 3.70 times greater risk of developing acute respiratory infections (ARI), which can lead to AOM, compared to non-smokers. The 95% confidence interval of 1.18-3.70 further supports the notion that active smoking increases the risk of AOM through ARI[13].

The research findings in table 2 indicate that 68.6% of the participants were exposed to environmental pollution. Another study also revealed a significant relationship between risk factors for environmental pollution and the occurrence of acute otitis media. The research utilized medical records involving 21,416 children aged 0-17 years. The results demonstrated a correlation between pollutants such as PM10, SO2, CO, and NO2, and the incidence of acute otitis media[14,15].

This study examined the risk factors for AOM in individuals with a family history of ear infections. The results showed that 57.15% of the respondents had a family history of ear infections, while 42.85% did not have this risk factor. This finding is consistent with a previous study[16], conducted on elementary school children in Central Java, which also reported a significant association between family history and AOM among 125 respondents.

CONCLUSION

Risk factors that influence the occurrence of AOM in the ENT clinic of UMM General Hospital consist of age, gender, history of allergies, history of ARI, exposure to cigarette smoke, exposure to environmental pollution and family history of ear disease. The most dominant risk factor was exposure to environmental pollution and cigarette smoke.

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