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Demographic and Clinical Patterns of Acute Otitis Media in a Secondary Care Setting

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Abstrak

Acute Otitis Media (AOM) is an acute inflammation of the middle ear lasting less than three weeks and is a common condition in low-income countries such as Indonesia. Prompt and appropriate care is essential to prevent progression to more severe forms. This study aimed to describe the characteristics of AOM patients treated at the ENT Outpatient Clinic of Deli Serdang Lubuk Pakam Regional General Hospital in 2017. This was a descriptive cross-sectional study involving 102 AOM cases identified through total sampling at the ENT Outpatient Clinic of Deli Serdang Lubuk Pakam Regional General Hospital throughout 2017. The measured variables included age, gender, affected ear, chief complaint, treatment, and hearing impairment. Male patients accounted for 57.8% of cases, while females comprised 42.2%. Most patients were aged 0–5 years. The left ear was most affected (51.9%). The most frequent symptom was ear pain, reported in 36.3% of cases. All patients received medical treatment. Hearing impairment was observed in 54.9% of patients. Conclusion: AOM was most prevalent among male children aged 0–5 years. Ear pain was the most common presenting complaint. Medical therapy was the primary treatment modality, and over half of the patients experienced hearing impairment.

Keywords: *Acute Otitis Media (AOM); Affected Ear; Symptom Treatment; Hearing Impairment.*

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INTRODUCTION

Acute Otitis Media (AOM) is an inflammation of part or all of the mucosa of the middle ear, Eustachian tube, mastoid antrum and mastoid cells that lasts less than three weeks (Djaafar et al., 2012). The incidence of AOM, as one of the infectious diseases of the ear that can cause hearing loss, is found to vary in various countries. According to World Health Organization (2007), AOM is a common disease in countries with low economies. This disease has also caused other significant burdens, including time and costs. Coticchia et al. (2013) stated that more than 80% of children in the United States are diagnosed with AOM by the age of 3 years and spending on otitis media is estimated at around 4.1 billion dollars for children alone.

Another study conducted by Meropol et al. (2008) stated that among all antibiotics given to children in the United States, 45-62% of them were given for AOM indications. Due to the high use of antibiotics, the burden of the country used for AOM cases is quite significant, exceeding 3.8 trillion dollars each year. Meanwhile in Canada, specifically in Quebec, the cost of handling AOM is estimated to cost more than 10 million dollars each year and medical personnel spend approximately 4.9 hours for the entire handling of AOM (Dubé et al., 2011; Meropol et al., 2008).

AOM is more common in children. This is because the Eustachian tube in children is shorter and more horizontal than in adults, so AOM is more common in children. Research conducted by Donaldson (2010) found that 70% of children in the United States experience

≥ 1 AOM attack before the age of 2 years. Some babies may experience their first attack immediately after birth and are considered at risk for recurrent otitis media. The age most susceptible to AOM is 6-11 months, where the frequency will decrease with age, namely in the age range of 18-20 months. In older children, some children tend to continue to experience AOM with a fairly small percentage of occurrence and occurs most often at the age of 4 years and early age of 5 years. After permanent teeth appear, the incidence of AOM decreases significantly, although some individuals who do have a high tendency to experience otitis still often experience acute exacerbation episodes until entering adulthood. Sometimes, adult individuals who have never had a history of ear disease before, but experience an Upper Respiratory Tract Infection (URTI) caused by a viral infection, also experience AOM (Donaldson, 2010).

In addition to children, AOM also occurs in adults. Redaelli de Zinis et al. (2003) research in 1993-2000 found 11 AOM patients aged between 21-71 years in Brazil. Geyik et al. (2002) in their study in Turkey found 56 cases of AOM in adults. A study conducted by Yonamine et al. (2009) stated that the estimated incidence of AOM in adults is around 0.004% and the progression of AOM cases is generally more severe in adults than in children.

Racial differences also affect the incidence of AOM. Native Americans are at higher risk of AOM compared to African Americans living in the same community. Another study conducted by Dubé et al. (2011) stated that by the age of 3 years, 60-70% of children have experienced at least 1 episode of AOM and recurrent cases of AOM. A study by Howie showed that an episode of S. pneumoniae infection in the first year of life was associated with a continued incidence of recurrent acute otitis media episodes. This condition is more common in boys than girls (Dubé et al., 2011; Soepardi et al., 2012). Research by Titisari (2005) conducted at the ENT Department, FKUI RSCM & ENT Polyclinic, RSAB Harapan Kita showed that there were 43 patients who experienced AOM between August 2004 and February 2005 and the highest proportion of AOM sufferers were aged >5-12 years with a percentage of 32.6%.

The incidence of AOM is higher in men than women. A study conducted by Umar et al. (2013) in East Jakarta City, on 502 AOM sufferers who obtained the highest proportion were men with a percentage of 50.39% and women with a percentage of 49.61%. A study conducted by Wang et al. (2011) also obtained a larger proportion in men, namely 54.6% and in women 45.4%.

It is also said that the trigger for AOM is upper respiratory tract infection. In children, the more often a child is attacked by respiratory tract infection, the greater the possibility of AOM. Other factors that influence the occurrence of AOM are the amount of exposure to cigarette smoke, the time of exclusive breastfeeding, the child's play environment and residence, decreased immune system, and a history of AOM in the family. Serious symptoms such as fever, otalgia and otorrhea can interfere with a child's daily activities and have a major negative impact on their quality of life (Wang et al., 2011).

According to research conducted by Culpepper et al. (1993) showed that the highest proportion of clinical symptoms of AOM is ear pain, which is 89.3%. According to Djaafar et al. (2012), most AOM patients who only experience pain symptoms prefer to go to the nearest clinic or buy medicine at the pharmacy. When patients experience other symptoms such as discharge from the ear, patients feel anxious and come to the hospital. Research conducted by Titisari (2005) stated that AOM occurs more often in one ear (unilateral) with a percentage of 79.1% in unilateral (right/left) while in bilateral only 21.9%.

In addition, OMA can also cause hearing loss. Research conducted by Awuah et al. (2012) obtained results that out of 69 patients diagnosed with OMA, 63 people (91.3%) experienced hearing loss (unilateral/bilateral). Hearing loss in OMA sufferers is caused by fluid accumulation in the tympanic cavity due to infection.

AOM if not treated properly can develop into Chronic Suppurative Otitis Media (CSOM), Therefore, AOM needs special attention so that this disease can be prevented and does not continue to develop. Therefore, researchers are interested in conducting research on the characteristics of patients suffering from Acute Otitis Media at the Deli Serdang Lubuk Pakam Regional General Hospital (RSUD).

METHOD

This observational study is a cross-sectional study conducted at Deli Serdang Lubuk Pakam Regional Hospital on 192 patients with acute otitis media during 2017 who were selected using the saturated sampling method (Total Sampling Technique). The selection of research samples in this study was also limited by inclusion and exclusion criteria.

The inclusion criteria in this study were medical record data of patients suffering from acute otitis media and had complete data at Deli Serdang Lubuk Pakam Regional Hospital from January 1, 2017 to December 31, 2017. While the exclusion criteria in this study were incomplete patient medical record data.

This study took secondary data from medical records during 2017. The research data were patient characteristics data including gender, age, side of the ear that hurts, main complaint, management, and hearing loss. All data obtained in this study were analyzed with IBM SPSS 27 using descriptive statistics. Descriptive statistics measure the frequency and proportion of AOM patients presented in the form of tables, diagrams, and text.

RESULT AND DISCUSSION

This study was conducted at the ENT Polyclinic of Deli Serdang Lubuk Pakam Regional Hospital located at Jalan Mh.Thamrin No. 126, Lubuk Pakam, Deli Serdang Regency, North Sumatra. Deli Serdang Lubuk Pakam Regional Hospital is located in Lubuk Pakam City which is the capital of Deli Serdang Regency. From the capital city of North Sumatra Province, namely Medan City, this hospital is only ± 29 km away with a travel time of about 30 minutes. This hospital is the only regional hospital owned by the Deli Serdang Regency Government, as a teaching hospital and referral service center, with class B status, based on the Decree of the Minister of Health of the Republic of Indonesia Number 405 / MENKES / SK / IV / 2008 dated April 25, 2008 and has been fully accredited through SK.No.HK.03.05 / III / 3389/2008.

In this study, the characteristics of the samples assessed in this study were gender, age, side of the affected ear, main complaint, management, and hearing loss, the frequency distribution of which can be seen in Figure 1.

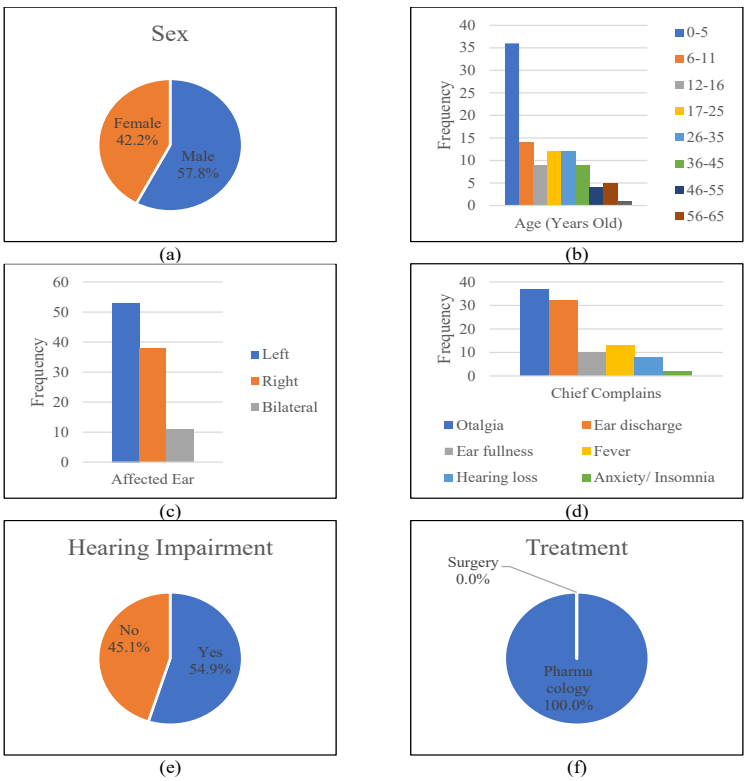

Figure 1. Frequency Distribution Diagram of Characteristics of AOM Patients in ENT Polyclinic Patients of Deli Serdang Lubuk Pakam Hospital in 2017. (a) Pie Chart based on

Gender, (b) Bar Chart based on Age, (c) Bar Chart based on ear pain, (d) Bar Chart based on Main Complaint, (e) Pie Chart based on Hearing Disorders, and (f) Pie Chart based on Management.

Gender as one of the characteristics assessed in this study, the frequency distribution of AOM patients in the ENT Polyclinic of Deli Serdang Lubuk Pakam Hospital in 2017 can be seen in the following table.

For more details, each characteristic of AOM patients is described one by one in the form of tables and narratives. Frequency distribution of AOM patients in ENT Polyclinic patients of Deli Serdang Lubuk Pakam Hospital in 2017 based on Gender.

Table 1. Frequency Distribution of Acute Otitis Media (AOM) Patients in ENT Polyclinic Patients of Deli Serdang Lubuk Pakam Regional Hospital in 2017 Based on Gender

Gender	Frequency	Percentage (%)
Male	59	57.8
Female	43	42.2
Total	102	100.0

In Table 1, it can be seen that the frequency distribution of AOM sufferers based on gender is male as many as 59 people (57.8%) and female as many as 43 people (42.2%). The highest frequency of AOM sufferers based on gender is male as many as 59 people (57.8%) while the lowest frequency is female as many as 43 people (42.2%).

The results of this study are in line with research conducted by Umar (2013) in East Jakarta City, of 502 OMA sufferers who received the highest proportion were men with a percentage of 50.39% and women with a percentage of 49.61%. Research conducted by Wang et al. (2011) also obtained a larger proportion in men, namely 54.6% and in women 45.4%.

However, research conducted by Titisari (2005) obtained different results from this study, where the research obtained a larger proportion in women, namely 51.2% and in men 48.8%. In research conducted by Palandeng et al. (2013) at the THT-KL BLU Polyclinic, Prof. Dr. R. D. Kandou Manado General Hospital, it also stated that the proportion was higher in female patients, namely 55% and male patients 45%. From several previous studies, there was no mention of the relationship between gender and the incidence of AOM. In addition to gender, this study also evaluated the age of AOM patients at the ENT Polyclinic of Deli Serdang Lubuk Pakam Hospital in 2017 based on age which can be seen in the Table 2.

From the data in Table 2, it can be seen the frequency distribution of AOM sufferers based on age with 0-5 years old as many as 36 people (35.3%), 6-11 years old as many as 14 people (13.7%), 12-16 years old as many as 9 people (8.8%), 17-25 years old as many as 12 people (11.8%), 26-35 years old as many as 12 people (11.8%), 36-45 years old as many as 9 people (7.5%), 46-55 years old as many as 4 people (3.9%), 56-65 years old as many as 5 people (4.9%), and age>65 years as many as 1 person (1.0%). The frequency distribution of AOM sufferers based on age is the largest age of 0-5 years, which is 36 people (35.3%), while the smallest frequency is age>65 years, which is 1 person (1.0%).

Table 2. Frequency distribution of AOM patients in ENT Polyclinic patients at Deli Serdang Lubuk Pakam Regional Hospital in 2017 based on age

Age (years)	Frequency	Percentage (%)
0-5	36	35.3
6-11	14	13.7
12-16	9	8.8
17-25	12	11.8
26-35	12	11.8
36-45	9	8.8
46-55	4	3.9
56-65	5	4.9
>65	1	1.0
Total	102	100

The results of this study are in accordance with those stated by Donaldson (2010) that AOM occurs more often in children aged <5 years. The results of the study conducted by Titisari (2005) at the Department of ENT FKUI RSCM & ENT Polyclinic RSAB Harapan Kita showed that the highest proportion of AOM patients were aged >5-12 years with a percentage of 32.6%.

The results obtained in this study are in accordance with the theory that the incidence of AOM is higher in children than in adults. This is due to the immature structure and function of the Eustachian tube. In children, the Eustachian tube is shorter, wider, and tends to be more horizontal when compared to the Eustachian tube in adults. This condition makes inflammation of the Eustachian tube very common in children. This inflammation will trigger physiological disorders of the Eustachian tube in protecting the middle ear so that the tendency for middle ear infection increases (Djaafar et al., 2012). The analysis was then continued to assess patient characteristics related to the side of the affected ear, the frequency distribution of which can be seen in Table 3.

Table 3. Frequency distribution of AOM patients in ENT Polyclinic patients at Deli Serdang Lubuk Pakam Regional Hospital in 2017 based on the side of the affected ear

The side of the ear that hurts	Frequency	Percentage (%)
Left	53	51.9
Right	38	37.3
Bilateral	11	10.8
Total	102	100

From the data in Table 3, it can be seen that the frequency distribution of AOM sufferers based on the side of the ear that hurts is the left ear as many as 53 people (51.9%), the right ear as many as 38 people (37.3%), and both ears or bilateral as many as 11 people (10.8%). The frequency distribution of AOM sufferers based on the side of the ear that hurts with the highest frequency being the left ear with a total of 53 people (51.9%), and the lowest frequency being both ears or bilateral with a total of 11 people (10.8%).

The results of this study are in accordance with Titisari (2005) which stated that the highest proportion was unilateral (right/left) which was 79.1% while bilateral was only 21.9%. However, previous studies did not mention the cause of the unilateral proportion being higher than bilateral.

In addition to the side of the ear that hurts, this study also analyzed the main complaints of AOM patients at the ENT Polyclinic of Deli Serdang Lubuk Pakam Hospital in 2017 and the frequency distribution can be seen in the following table.

Table 4. Frequency distribution of AOM patients in ENT Polyclinic patients at Deli Serdang Lubuk Pakam Regional Hospital in 2017 based on main complaints

Main complaint	Frequency	Percentage (%)
Ear pain	37	36.3
Fluid coming out of the ear	32	31.4
Feeling of fullness in the ear	10	9.8
Fever	13	12.7
Hearing loss	8	7.8
Restless/difficulty sleeping	2	2.0
Total	102	100.0

From the data in Table 4, it can be seen that the frequency distribution of AOM sufferers based on the main complaint, namely ear pain as many as 37 people (36.3%), discharge from the ear as many as 32 people (31.4%), a feeling of fullness in the ear as many as 10 people (9.8%), fever as many as 13 people (12.7%), decreased hearing as many as 8 people (7.8%), and restlessness/difficulty sleeping as many as 2 people (2.0%). The frequency distribution of AOM sufferers based on the highest main complaint was ear pain with a total of 37 people (36.3%) and the lowest frequency was restlessness/difficulty sleeping with a total of 2 people (2.0%).

The results of this study are in line with the results of a study conducted by Culpepper et al. (1993)which showed that the highest proportion of clinical symptoms of AOM was ear

pain, which was 89.3%. According to Djaafar et al. (2012), most AOM patients who only experience pain symptoms prefer to go to the nearest clinic or buy medicine at the pharmacy. When patients experience other symptoms in the form of discharge from the ear, patients feel anxious and come to the hospital. The presence of fluid or discharge from the ear is caused by a ruptured tympanic membrane so that secretions in the form of pus flow into the outer ear canal.

Not only personal characteristics and patient complaints, this study also assessed the management received by AOM patients at the ENT Polyclinic of Deli Serdang Lubuk Pakam Hospital in 2017 and the frequency distribution can be seen in the following table.

Table 5. Frequency distribution of AOM patients in ENT Polyclinic patients at Deli Serdang Lubuk Pakam Regional Hospital in 2017 based on therapy

Therapy	Frequency	Percentage (%)
Medication	102	100.0
Surgery	0	0.0
Total	102	100.0

Table 5 shows that the frequency distribution of OMA sufferers based on therapy, namely medication, was 121 people (100%) and none underwent surgery (0%). According to Djaafar et al. (2012), the management of OMA depends on the stage of the disease, namely:

a. Occlusion stage: given HCl nasal drops, 0.5% ephedrine, and antibiotics.
b. Hyperemic stage: given analgesics, antibiotics, and nose drops.
c. Suppuration stage: antibiotics and symptomatic drugs are given. Myringotomy can also be performed if the tympanic membrane is protruding and still intact to prevent perforation.
d. Perforation stage: given 3% H2O2 for 3-5 days and adequate antibiotics.

Finally, this study also analyzed hearing loss in AOM patients at the ENT Polyclinic of Deli Serdang Lubuk Pakam Hospital in 2017 and the frequency distribution can be seen in the following table.

Table 6. Frequency distribution of AOM patients in ENT Polyclinic patients at Deli Serdang Lubuk Pakam Regional Hospital in 2017 based on hearing disorders

Hearing disorders	Frequency	Percentage (%)
Sufferer	56	54.9
Not a sufferer	46	45.1
Total	102	100.0

From the Table 6, it can be seen that the frequency distribution of OMA sufferers based on the presence or absence of hearing loss is that there are 56 people (54.9%) with hearing loss, and 46 people (45.1%) without hearing loss. The highest frequency distribution based on the presence or absence of hearing loss is that there are 56 people (54.9%) with hearing loss.

The results of this study are in accordance with the results of research conducted by Awuah et al. (2012) which obtained results that out of 69 patients diagnosed with AOM, 63 people (91.3%) experienced hearing loss (unilateral/bilateral). Hearing loss in AOM patients is caused by fluid accumulation in the tympanic cavity due to infection.

CONCLUSION

From the results of this study it can be concluded that the majority of AOM patients at the ENT Polyclinic of Deli Sedang Lubuk Pakam Hospital in 2017 were male (57.8%) from the 0-5 years group (35.3%). The majority of AOM patients showed hearing loss with clinical symptoms of ear pain (36.3%) especially in the left ear (51.9%).

RECOMMENDATION

Further research is needed to provide a comprehensive picture to the hospital about the condition of patients with hearing loss. So that appropriate treatment can be given to patients so that they can recover quickly.

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