

**RESEARCH ARTICLE**

**Prevalence and Profile of Patients with Otitis Externa at the Universitas Sumatera Utara Hospital in Medan in 2020-2021**

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**Abstract:** Otitis externa is an acute or chronic inflammation of the ear canal which also involves the tympanic membrane and pinna. This disease has a prevalence rate of about 10% of all Ear Nose Throat (ENT) diseases. This research aims to determine the prevalence and profile of the disease based on demographic characteristics (age, sex, and occupation), chief complaint, type, location, and comorbidities in patients with otitis externa. This research is a hospital-based retrospective study of patients diagnosed with otitis externa in Universitas Sumatera Utara Hospital Medan for the period January 2020 to December 2021. Data were obtained from medical records then processed using the SPSS program and analysed using descriptive statistics. The total number of patients in Universitas Sumatera Utara Hospital for the 2020-2021 period who met the study inclusion and exclusion criteria was 291 patients. Found 47.4% male and 52.6% female with a ratio of 1:1.1. The peak age group at 26-45 years was 36.8%. In employment status, 23.0% are self-employed and patients who do not work 22.7% are the majority while 0.3% Polisi Republik Indonesia (POLRI)/Police of the Republic of Indonesia and labourers are a minority. The majority 72.5% come with a chief complaint of pain or tenderness in the ear followed by 10% of the ear that felt full. The most common type of otitis externa was acute diffuse as much as 91.8% with the location of the right ear that was most often complained of as much as 44.7%. Otitis externa disease is commonly found in patients who do not have other comorbidities as much as 87.3%. Otitis externa is a common ear disease that affects all age groups and genders. Most of the patients come with complaints of pain in the right ear and were diagnosed with acute diffuse otitis externa.

**Keywords:** Otitis externa, prevalence, profile

## INTRODUCTION

the cutis or subcutis of the external ear canal, it is also possible to affect the tympanic membrane and pinna.<sup>1</sup> Otitis externa can be experienced by all genders, occupations, and age groups, both adults and children. However, several studies have shown that the highest prevalence of otitis externa patients is found in the age range of 21-30 years. This is associated with the potential for increased outdoor activity of these individuals which directly and frequently exposes them to dust, humidity, high temperatures, and other risk factors.<sup>2</sup>

Factors that facilitate the occurrence of otitis externa such as changes in pH in the ear canal which are usually normal or acidic to alkaline, too little cerumen, trauma to the epithelial layer, or in warm and humid air conditions, can cause protection against infection to decrease and make germs and mushrooms are easy to grow. Diabetes mellitus is also a predisposing factor for otitis externa. In diabetics, the pH of the cerumen is higher than the pH of the cerumen of patients who do not have diabetes where this condition makes diabetics more prone to otitis externa. As a result of immunocompromised factors and microangiopathy, otitis externa progresses to malignant otitis externa where inflammation progressively extends to the subcutaneous layer, cartilage, and surrounding bone, resulting in chondritis, osteitis, and osteomyelitis which destroys the temporal bone.<sup>3</sup>

Otitis externa is an acute or chronic inflammation of the ear canal that affects

Otitis externa can be classified based on the onset of symptoms into acute otitis externa if symptoms last less than 6 weeks and chronic if symptoms last more than 3 months, and necrosis which is a malignant form of otitis externa. Acute otitis externa is further divided into diffuse otitis externa and otitis externa circumscripta. It can be concluded that otitis externa can be divided based on its clinical course into diffuse otitis externa, circumscripta otitis externa, chronic otitis externa, and malignant otitis externa (necrotizing otitis externa).<sup>4</sup>

Complaints of pain or pain in the ear are the main complaints that are usually complained of by otitis externa sufferers. There is pressure on the tragus or there is tension on the pinna, usually exacerbating the pain experienced by sufferers. Pain in the ear can vary from slight discomfort, a feeling of fullness in the ear, a burning feeling to intense pain and throbbing.<sup>5</sup> Further symptoms are otorrhea (watery discharge from the ear), itching, erythema, and swelling of the ear canal, which has the potential to cause conductive hearing loss.<sup>1</sup>

Otitis externa is one of the most common types of ear disease and is widely treated by both general practitioners and Ear, Nose, and Throat specialists with an estimated overall prevalence of this condition of around 10%.<sup>6</sup> Based on the results of data analysis from the National Ambulatory-Care (NAC) and Emergency Department

(ED) in America in 2007, an estimated 2.4 million health visits or around 8.1 visits per 1000 residents in the United States were diagnosed with acute otitis externa.<sup>7</sup> Other studies also show that the prevalence of otitis externa in developing countries is 17.5%.<sup>2</sup> In Indonesia alone, the prevalence of otitis externa, is still limited. In research at the ENT Polyclinic, RSU Prof. Dr R. D. Kandou Manado, in 2011, obtained from 5,297 visitors there were 440 (8.33%) cases of otitis externa from.<sup>8</sup>

Otitis externa is a health problem that needs special attention. Because there are not enough studies on otitis externa, especially in Indonesia, researchers are interested in conducting research that records and discusses the prevalence and profile of otitis externa sufferers based on gender, age, occupation, type of otitis externa, chief complaint, location of the affected ear, and comorbidities at the Universitas Sumatera Utara Hospital in Medan for the 2020-2021 period.

## METHODS

This research is descriptive with a retrospective cross-sectional design study using secondary data obtained from the medical records of otitis externa patients at the Universitas Sumatera Utara Hospital for the period January 2020 - December 2021. This research has been approved by the ethics committee of the Faculty of Medicine, Universitas Sumatera Utara, under the ethical clearance number **844/KEPK/USU/2022**.

The sampling technique in this study was total sampling which met the

inclusion and exclusion criteria. The inclusion criteria in this study were research subjects registered as otitis externa patients (circumscriptive acute otitis externa, diffuse acute otitis externa, chronic otitis externa, and malignant otitis externa) at the Universitas Sumatera Utara Hospital Medan visiting January 2020 – December 2021 and the patient's medical record have complete data such as age, gender, occupation, chief complaint, type of otitis externa, location of the complained ear, and comorbidities needed in this study. The exclusion criteria in this study were the unreadability of the patient's medical record data. The data obtained were then processed using the SPSS program and analysed using descriptive statistics.

## RESULTS

This research was conducted from 10 October 2022 to 21 November 2022 at the Universitas Sumatera Utara Hospital on the medical records of 392 otitis externa patients who visited the Universitas Sumatera Utara Hospital for the 2020-2021 period. Found 291 patients who met the inclusion and exclusion criteria.

Table 1 shows that the highest cases of otitis externa based on gender were female patients namely as many as 153 patients (52.6%), while patients with male sex were as many as 138 patients (47.4%).

Based on age group, the most cases of otitis externa were in the 26-45 year age group 107 patients (36.8%), followed by the 12-25 year age group of 79 patients (27.1%), the 46-65 year age group of 75

patients (25.8%), then the 0-11 year age group of 24 patients (8.2% ), and the least in the age group >65 years, namely 6 patients (2.1%).

Based on occupation, the highest cases were found in patients who worked as entrepreneurs, namely 67 patients (23%), followed by patients who did not work, namely 66 patients (22.7%), then patients who worked as private employees, namely 50 patients (17.2% ), then students as many as 38 patients (13.1), students as many as 36 patients (12.4%), civil servants as many as 29 patients (10%), farmers as many as 2 patients (0.7%), traders as much as 2 patients (0.7%), and the lowest was in the group of patients who worked as POLRI, namely 1 person (0.3%) and 1 worker (0.3%).

**Table 1.** Demographic characteristics of sufferers.

<b>Demographic Characteristics</b>	<b>n</b>	<b>%</b>
<b>Gender</b>		
Male	138	47.4
Female	153	52.6
<b>Age (years old)</b>		
0-11	24	8.2
12-25	79	27.1
26-45	107	36.8
46-65	75	25.8
>65	6	2.1

<b>Occupation</b>		
Housekeepers	66	22.7
Junior and senior high school	36	12.4
Student	38	13.1
Employees	29	10
Private employees	50	17.2
Self-employed	67	23
Farmer	2	0.7
POLRI	1	0.3
Labourer	1	0.3
Trader	2	0.7
<b>Total</b>	<b>291</b>	<b>100</b>

Table 2 shows that the main complaint most commonly experienced by otitis externa sufferers was pain or pain in the ear, namely 211 cases (72.5%), followed by complaints of fullness/clogged ness in the ears in 29 cases (10%), then complaints of discharge. as many as 18 cases (6.2%), then complaints of hearing loss (deafness/tinnitus) as many as 17 cases (5.8%), and complaints of itching in the ears as many as 16 cases (5.5%).

**Table 2.** Frequency distribution based on main complaints

Main complaint	n	%
Pain or tenderness in the ear	211	72.5
Itchy feeling in the ears	16	5.5
Feeling full/ clogged ears	29	10
Discharge	18	6.2
Hearing loss (deafness/ <i>tinnitus</i> )	17	5.8
<b>Total</b>	<b>291</b>	<b>100</b>

Table 3 shows that in this study the most common type of otitis externa experienced by patients was diffuse acute otitis externa, namely 267 cases (91.8%), followed by chronic otitis externa with 16 cases (5.5%), then circumscribed acute otitis externa with 8 cases (2.7%), and no cases of malignant otitis externa were found at the Universitas Sumatera Utara Hospital for the period January 2020-December 2021 (0%).

**Table 3.** Frequency distribution by type of otitis externa

Types of otitis externa	n	%
Circumscripta acute otitis externa	8	2.7
Diffused acute otitis externa	267	91.8
Chronic otitis externa	16	5.5
Malignant otitis externa	0	0
<b>Total</b>	<b>291</b>	<b>100</b>

Table 4 shows that in this study, the location of the ear that most patients complained about was the right ear, namely 130 cases (44.7%), followed by the left ear with 128 cases (44%), and both ears with 33 cases (11.3%).

**Table 4.** Frequency distribution based on the location of the complained ears

Location of the Complained Ear	n	%
Right ear	130	44.7
Left ear	128	44
Both ears	33	11.3
<b>Total</b>	<b>291</b>	<b>100</b>

Table 5 shows that in this study, the majority of otitis externa patients did not have comorbidities, namely 254 patients (87.3%), while patients who had comorbidities were as many as 37 patients (12.7%). Patients who have comorbidities mostly suffer from diabetes mellitus, namely 24 patients, followed by hypertension in as many as 20 patients, 3

patients with HIV/AIDS, 2 patients with congestive heart failure (CHF), 2 patients with chronic obstructive pulmonary disease (COPD), 1 person with coronary heart disease, 1 person with hepatitis B, and 1 person with pulmonary TB.

**Table 5.** Frequency distribution based on concomitant diseases.

Concomitant Diseases	n	%
Yes	37	12.7
No	254	87.3
<b>Total</b>	<b>291</b>	<b>100</b>

## DISCUSSION

It was found that the comparison between male and female patients in this study was 1:1.1 where the highest cases of otitis externa were in patients who were female. The results of this study following research conducted in Iran by Kiakojuri et al., that 54.31% of sufferers were women while 45.69% of sufferers were men<sup>9</sup>. Research conducted by Sutanto also showed that out of 92 cases, the prevalence of otitis externa was found to be more in women, namely 52.2% and in men, namely 47.8% at the Universitas Sumatera Utara Hospital in 2017.<sup>10</sup> However, different results were found in the study by Tanaya et al. at the ENT Polyclinic at Sanglah Hospital Denpasar in 2018, out of 70 patients, 42 patients (60%) were male, 28 patients (40%) were female.<sup>11</sup> Different results were also found in the study of Adegbiyi et al., that out of 392 patients, 179 (54.4%) patients were male and 150 (45.6%) patients were

female, but still in a ratio of 1:1<sup>2</sup>. From these results it can be found that the incidence of otitis externa can occur in any gender, and no studies have been found that prove that there is a relationship between the incidence of otitis externa and gender.

The age group with otitis externa in this study was in the age group of 26-45 years. The results in this study were almost the same as the study of Adegbiyi et al., that the age group that suffered most from otitis externa was in the age range 21-30 years, namely 91 patients (27.7%) and in the age range 31-40 years, namely 61 patients (18.6%), and the age group that suffers from otitis externa the least is the age group >61 years, namely 11 patients (3.3%)<sup>2</sup>. Similar results were found in a study by Triastuti et al., at Sanglah General Hospital, Denpasar, that out of 105 patients, the group of patients most affected by otitis externa was in the age range of 15-49 years, namely 72 patients (68.6%).<sup>12</sup> Although previous studies have shown that otitis externa can occur in all age groups, the possible reason is that in adults (25-65 years) outdoor activity is higher than in other age groups. This also exposes sufferers in this age group to excessive heat, humidity, dust, and others.<sup>2</sup>

Based on occupation, the highest cases were found in patients who work as self-employed patients followed by groups of patients who are housekeepers. Research reported by Tobing in 2014 at Dr General Hospital Pirmgadi Medan, showed that the highest number of otitis externa sufferers was found in the group

of patients who were housekeepers, namely 20 patients (39%), followed by entrepreneurs and students, each with 9 patients (17%).<sup>13</sup> Data from a study by Kiakojuri et al. also found that the highest incidence of otitis externa was found in the group of patients who worked as housekeepers (not working), namely 43 patients (37.07%), followed by entrepreneurs with 23 patients (19.83%), and employees of 21 patients (18.1%).<sup>9</sup>

There are no studies that show that there is a relationship between the incidence of otitis externa and work. Like gender and age group, the incidence of otitis externa can occur in all patients, both those who have jobs and those who do not have jobs. In the study by Kiakojuri et al., it was found that the majority of otitis externa sufferers were women who were housekeepers (not working), similar to the results shown in this study. Although women tend to be more health conscious, the contributing factors to this condition are likely the habit of picking their ears and excessive humidity and heat in the house, especially in countries with tropical and subtropical climates, which can affect the condition and increase the incidence of otitis externa.<sup>9</sup>

Pain or pain in the ear is the most common complaint of otitis externa sufferers. Wulandari and Sudipta stated that at Sanglah General Hospital, Denpasar, the most common clinical symptom complained of by otitis externa sufferers was ear pain, namely 67.9%, followed by watery ears (55.9%).<sup>14</sup> Pain in the ear is the most common major

complaint found in the study of Musa et al. in Kaduna, Nigeria<sup>15</sup>. Sutanto's research at the Universitas Sumatera Utara Hospital also showed that the most common complaint of otitis externa sufferers was pain or tenderness in the ear, which was 57 cases (62%), followed by itchy ears in 15 cases (16.3%), a feeling of fullness or congestion in the ear in 10 cases (10.9%), hearing loss in 8 cases (8.7%), and discharge in 2 cases (2.2%).<sup>10</sup>

The results of this study are following the theory stated by the Ministry of Health of the Republic of Indonesia (2014) that the typical symptom of acute otitis externa is otalgia (severe pain in the ear). Pain in the ear can vary from slight discomfort, a feeling of fullness in the ear, a burning feeling to intense pain and throbbing.<sup>5</sup> The typical finding in acute otitis externa is ear pain induced or exacerbated by pressure on the tragus or tension on the pinna, along with swelling of the ear canal that can cause complete obstruction, where the appearance of the skin of the ear canal can be erythematous or pale due to oedema.<sup>1</sup> Generally, otitis externa patients come to the hospital with complaints of pain in the ear, especially when the earlobe is touched and when chewing. If this inflammation is not treated adequately, complaints such as pain, itching and possibly smelly secretions will persist. Otitis externa can spread to the pinna, periauricular, or temporal bone and usually involves the entire ear canal.<sup>21</sup>

The results of this study also support the theory that complaints of pain

or pain in the ears are the main complaints that are usually complained of by otitis externa sufferers compared to complaints of itching in the ears, the feeling of fullness or congestion in the ears, and hearing loss (deafness/tinnitus). Complaints of fullness in the ear and hearing loss are caused by swelling and occlusion of the ear canal.<sup>16</sup> Hearing loss that occurs in patients with otitis externa is caused by oedema of the skin of the ear canal, serous or purulent secretions, or progressive thickening of the skin in old otitis externa so that it often blocks the lumen of the canal and causes conductive hearing loss.<sup>5</sup>

Severe pain is usually felt by sufferers of acute otitis externa, especially circumscribed acute otitis externa, regardless of the degree of severity they experience. This is because the skin of the ear canal does not contain loose tissue underneath, so pain arises when pressing the perichondrium. Pain can also arise spontaneously when opening the mouth (temporomandibular joint).<sup>3</sup> The intense pain felt by otitis externa patients is also caused by: the skin and cartilage of the outer 1/3 of the ear canal being connected to the skin and cartilage of the auricle so that the slightest movement from the auricle will be delivered to the skin and cartilage of the outer ear canal.<sup>21</sup>

The most common type of otitis externa experienced by patients at the Universitas Sumatera Utara Hospital is diffuse acute otitis externa, The results of this study following research conducted by Trastuti et al., at Sanglah General Hospital, Denpasar, that out of 105

patients, the highest case was found to be diffuse acute otitis externa in 64 cases (61%).<sup>12</sup> The same thing was also found in the study of Musa et al., that most cases were diffuse acute otitis externa as much as 78.9%.<sup>15</sup> Research by Tanaya et al., also showed that the most common type of otitis externa was diffuse acute otitis externa, namely 67 patients (95.7%) of 70 patients.<sup>11</sup>

Diffuse external otitis, also known as swimmer's ear or hot weather ear, is one of the common cases of sufferers coming to see a doctor in tropical and subtropical areas.<sup>17</sup> Diffuse external otitis usually affects the skin of the ear canal two-thirds of the way. It appears that the skin of the ear canal is hyperaemic and has oedema that has no clear boundaries.<sup>3</sup> In humid weather, mild trauma to the ear canal such as light scratching can result in abrasion which will provide space for bacteria to grow. In addition, because it is hot and humid, patients tend to swim more often which is one of the predisposing factors for the occurrence of cases of diffuse acute otitis externa. Even if they don't swim, patients bathe more often and try to clean their ears which also predisposes to an increased likelihood of cases of acute otitis externa.<sup>18</sup>

The location of the ear that most sufferers complain about is the right ear. Similar results were found in the study of Adegbiyi et al., that unilateral otitis externa was the most complained of by patients, namely 251 cases (76.2%) compared to bilateral otitis externa, which was 78 cases (23.7%) and was more common in the right ear.<sup>2</sup> Damayanti's



research in 2017 at RSUP.H. Adam Malik Medan also showed that the location of the most involved ear was the right ear, namely 19 cases (50%), followed by the left ear as many as 16 cases (42.1%), and at least both ears (bilateral) only 3 cases (7.9%).<sup>17</sup> There is no definite reason to support this result. Allegedly, sufferers use their right hand more often than their left hand to clean their ears by carrying out one of the predisposing factors for otitis externa, namely by picking the ear.<sup>2,17</sup>

Although the majority of otitis externa patients in this study did not have comorbidities, the most common comorbid disease found in otitis externa patients who had comorbidities was diabetes mellitus, which is a risk factor for otitis externa.

In patients with malignant otitis externa, the main predisposing factor is diabetes mellitus, where the incidence of diabetes mellitus is found in 90-100% of patients who mostly have poor metabolic control.<sup>19</sup> In diabetics, the pH of the cerumen is higher than the pH of the cerumen of patients who do not have diabetes where this condition makes diabetics more prone to otitis externa. As a result of immunocompromised factors and microangiopathy, otitis externa progresses to malignant otitis externa where inflammation progressively extends to the subcutaneous layer, cartilage, and surrounding bone, resulting in chondritis, osteitis, and osteomyelitis which destroys the temporal bone.<sup>3</sup>

Diabetes mellitus is the most common comorbid disease in patients

with malignant otitis externa, namely 23 out of 30 patients (76%) who were observed from January 2008 to December 2018 in Belgrade, Serbia. The patient has type 2 diabetes mellitus and 13 of them are currently receiving insulin therapy. There were other co-morbidities observed, namely cases of hypertension in 13 patients, stroke in 3 patients, and myocardial infarction in 1 patient. There were 3 immunocompromised patients, 1 of whom had bladder cancer and was undergoing chemotherapy and the other two had secondary anemia.<sup>20</sup>

This study found several patient comorbidities such as hypertension, HIV/AIDS, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), coronary heart disease, hepatitis B, and pulmonary TB. HIV/AIDS sufferers are one of the predisposing factors for otitis externa because immunosuppressed patients are more susceptible to infection, especially fungal infections.<sup>1</sup> However, no studies have shown that there is a relationship between other co-morbidities found in this study and the incidence of otitis externa. Even though in this study patients who had comorbidities such as diabetes mellitus, hypertension, immunocompromised, etc. did not suffer from malignant otitis externa or chronic otitis externa, however, it was found that patients who had comorbidities had acute diffuse otitis externa which could eventually progress to chronic otitis externa. as well as malignant otitis externa, so it is necessary to increase preventive and educational efforts related

to the importance of maintaining ear hygiene and health to the public, especially in groups of patients who have comorbidities and predisposing factors such as diabetes mellitus.

## CONCLUSION

The frequency of occurrence of otitis externa at the Universitas Sumatera Utara Hospital in Medan in 2020-2021 is 291 cases. Based on demographic characteristics, the most common otitis externa sufferers were found in the female sex group, namely 153 patients (52.6%), in the 26 - 45-year age group, there were 107 patients (36.8%), and the majority of otitis externa sufferers worked as entrepreneurs. namely as many as 67 patients (23%). The main complaint felt by most otitis externa sufferers was pain or pain in the ear, as many as 211 patients (72.5%). The most common type of external otitis was diffuse acute otitis externa, in 267 patients (91.8%). The location of the ear that most patients with otitis externa complained about was the right ear, with as many as 130 patients (44.7%). Based on co-morbidities, the majority of otitis externa patients in this study did not have co-morbidities, namely 254 patients (87.3%).

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