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Risk Factor of Otitis Externa Patients

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ABSTRACT
Otitis externa is an inflammation of the ear canal that can extend to the outer ear or tympanic membrane, commonly caused by bacteria, fungi, and viruses. Warm, humid environments and risk factors such as age, gender, body weight, physical activity, and environmental conditions contribute to its development. Symptoms include ear pain, discharge, itching, and occasionally hearing loss. This Narrative Review analyzed 10 articles from 2020 to 2024 to identify characteristic risk factors of otitis externa. Findings reveal that the condition predominantly affects late adolescents and individuals aged 17-40 years. The review concludes that otitis externa can occur in any age group or gender, with certain occupations, like those involving art materials, showing higher incidence rates, and diffuse otitis externa primarily impacting productive age patients.

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INTRODUCTION

Otitis externa is an inflammation of the skin in the ear canal, which can also spread to the auricle (outer ear) or tympanic membrane. Infections are typically caused by bacteria, fungi, and viruses, and warm and humid environments are predisposing factors for otitis externa, as seen in countries experiencing summer seasons where incidences are more frequent (Wulandari & Sudipta, 2020). Acute otitis externa can be categorized into two types: diffuse otitis externa, often termed "swimmer's ear" or "tropical ear," commonly found in swimmers, and furuncle-like localized otitis externa, known as circumscribed otitis externa(Mandalahi T et al., 2023).

According to its etiology, otitis externa can be grouped into infectious types caused by bacteria, predominantly Staphylococcus aureus and Pseudomonas aeruginosa, as well as fungi and viruses. Reactive types include eczematous otitis externa, seborrheic otitis externa, and neurodermatitis. Otitis externa can further be categorized based on its progression: acute localized otitis externa, diffuse otitis externa, chronic otitis externa, and malignant otitis externa (Putu Wahyu D.T et al., 2020).

Symptoms commonly associated with otitis externa include ear pain (otalgia), discharge from the ear (otorrhea), itching, and in severe cases, hearing loss. Generally, the development of otitis externa begins when the ear is exposed to various etiological factors such as heat, potential trauma-inducing materials, loss of cerumen, and other irritants that reduce the acidity level of the outer ear, promoting bacterial growth and resulting in edema and excessive pain (Wulandari & Sudipta, 2020).

Indonesia, known for its tropical climate, is a contributing factor to the increased incidence of otitis externa due to high humidity and warmer temperatures (Raman et al., 2020). Reflecting on the rising number of otitis externa cases annually, there is a clear trend in tropical regions experiencing such conditions (Nieratschker et al., 2024).

Based on this background and the absence of recent data on the characteristics of otitis externa patients in Indonesia, the author aims to gather information from several studies linking risk factors in otitis externa patients.

THEORITICAL REVIEW

Acute otitis externa refers to inflammation of the external auditory canal lasting less than six weeks, whereas when the inflammation persists for more than three months, it is classified as chronic otitis externa. Bacterial infections are the most common cause of acute otitis externa, and it has been linked to conditions such as psoriasis, eczema, and allergies (Baoum et al., 2021).

Risk factors for otitis externa are extensively documented in the literature; however, there is a lack of information regarding the specific risk factors associated with acute otitis externa in our local context. Various factors can lead to infections of the external auditory canal and the onset of otitis externa, including the lack of cerumen, high humidity, trapped water in the ear canal, elevated temperatures, local trauma (such as from using cotton swabs),

anatomical abnormalities of the external ear canal, and dermatological conditions (Abdullahi & Aliyu, 2016).

RESEARCH METHODS

Design

This study is a Literature Review conducted using a Narrative Review design. This method is employed to identify, assess, evaluate, and interpret all available research. By using this method, a systematic review and identification of journals can be performed, with each process following predefined steps or protocols. The study also utilizes the PICO method in literature search.

Data Analysis

The data type in this research consists of secondary data, sourced from various references such as research journals, journal reviews, annual reports, books, and data related to the characteristics of otitis externa patients published between 2018 and 2023. Literature search was conducted through electronic databases including Google Scholar, Clinical Key, PubMed, Researchgate, and national survey results such as RIKESDAS, PSG, and WHO, using keywords like "Otitis externa." Content analysis was performed using a synthesis table comparing research methods, study subjects and objects, and variables studied, encompassing characteristics of otitis externa patients.

RESULTS

10 articles were analyzed using a synthesis table to see the variables studied by each study regarding patient characteristics;

No.	Author	Objective Study	Subject	Method	Result
1.	Tondi Rosali et al (2020)	The purpose of this study was to determine the relationship between risk factors and the incidence of otitis externa in the ENT-KL polyclinic of the Abdul Moeloek Hospital, Lampung Province in 2019.	The sample size was divided into 56 respondents who experienced otitis externa and 56 respondents who did not experience otitis externa.	Samples were taken using the consecutive sampling technique data analysis using the chi-square test.	The results of the data on the characteristics of respondents based on age show that the most otitis externa respondents are aged 0 - 10 years and 21 - 30 years with 12 respondents each (21.4%). Female> Male. The results of the research conducted are otitis externa (difusa) is closely related to the swimming pool which is found to have Pseudomonas aeruginosa microorganisms Plus if after swimming no proper drying of the ear is done

2.	Shada O.Baoum et al (2021)	In this literature review, we have discussed the epidemiology, risk factors, and monitoring of patients with acute otitis externa.	This study collects relevant studies and conducts an extensive literature search in the medline, cochra ne and EMBASE databases conducted on October 27, 2021 using medical subject heading (MeSH) or a combination of all possible related terms	This type of research is a literature review that varies epidemiology, risk factors, and monitoring of otitis externa patients.	Age group 7-12 years old are the most commonly affected. Male=female. Bacterial infections are responsible for about 90% of cases of otitis externa etiology. Even previous investigations reported that 98% of otitis externa cases are caused by bacterial infections. It has been shown that Pseudomonas aeruginosa (diffuse) and Staphylococcus aureus (pre-creative circumscription), with estimated prevalence rates of 22- 62%, and 11- 34% respectively.
3.	Sri Wahyu ni Gayatr i et al (2022)	The purpose of the study was to determine the characteristics of patients with otitis externa.	The data used in this study are secondary data, in the form of observational studies from several literatures related to the characteristics of otitis externa.	The research conducted was a literature review with a narrative review design.	The incidence of otitis externa is most common in the adult age group, and rare in the pediatric age group (generally 7-12 years old). Female>male. Based on the results of the study, it was found that the highest incidence of otitis externa was diffuse otitis externa. with the incidence influenced by hot and humid weather. This causes a change in the pH of the ear canal from acidic to alkaline, increasing the risk of bacterial infection.
4.	Putu Wahyu Dyatmi et all (2020).	The purpose of this study was to determine the prevalence of otitis externa cases based on	Total 70 existing samples.	Cross-sectional research design with the method of taking	The highest age group of otitis externa patients was in the Late Adolescent period (17-25 years), namely 17 people (24.3%). Male >

		age, gender and diabetes mellitus in the ENT clinic of Sanglah General Hospital in 2018.		through total sampling technique at the ENT polyclinic of Sanglah Hospital in Denpasar in 2018.	female. The most common type of otitis externa is diffuse acute otitis externa as many as 67 cases (94.3%).
5.	N.P Mirah Ayunda Karkita Wuland Ari et all (2020)	This study aims to improve public understanding of OE by knowing the description of the incidence of OE at Sanglah General Hospital.	The sampling technique uses secondary data in the form of medical records of Sanglah General Hospital in the 2015-2016 period.	This research method uses total sampling.	Most patients were from the age group of 15-49 years (55.9%). Female > Male. The most common cause of OE was trauma (58.3%) followed by Staphilococcus aureus infection which was the most common isolate (43.3%) lowered immunity (11.9%) and 9.5% were due to more than 1 cause.
6.	Zephania Saitabau, Abraham (2020	The aim of this study was to determine the prevalence and clinical characteristics of otitis externa in muhimbili national hospital the largest tertiary hospital in Tanzania.	16 patients were sampled with clinical symptoms of otitis externa with clinical presentations such as daytime ear pain, ear discharge and cranial nerve paralysis, EAC stenosis, granulation and plip.	The study was conducted with statistical analysis.	60-79 years old. Male>Female. Otitis Malginant.
7.	Michael Nierats Chkeret al (2024)	This study aims to link the effects of extreme weather events with the risk of acute otitis externa-related emergency department events.	A total sample of 1522 acute otitis externa clinic patients of the Vienna general hospital from 2015 to 2018 was analyzed. Meteorological data for the same study	This research uses analytical statistics	Most of the sample was aged 18-45 (63%) and the prevalence of Male > Female.

			period were obtained from the Austrian Central Institute of Meteorology and Geodynamics for Vienna and a non-linear distributed lag model was used to associate extreme weather events with the total number of AOE-related EVs.		
8.	Joy Firma L Tobing (2022)	This study aims to assess the age, gender, and type of otitis externa.	A total of 33 subjects with otitis externa participated in this study.	This research design is cross sectional.	The majority age was 21-30 years old (37%), Male > Female. Based on the type of otitis externa, diffuse otitis externa was the most common type (19 subjects, 57.6%), followed by circumscribed otitis externa (9 subjects, 24.2%) and malignant otitis externa (6 subjects, 18.2%). In line with previous studies that showed diffuse otitis externa patients (78.9%) were more common.
9.	Qatrun Nada Medina et al. (2023)	This study aims to determine the prevalence and disease profile based on demographic characteristics (age, gender, and occupation) of the main complaint, type, location and comorbidities in	Patients at the hospital diagnosed with otitis externa at the university hospital of North Sumatra in the period 2020-2021,	This study is a retrospective study of medical records then processed using the SPSS program and analyzed using descriptive statistics.	The highest prevalence was at the age of 26-45 years (36.8%), female>male with diffuse 91.8% and circumflex 2.7%.

		patients with otitis externa.			
10.	Matteo Gelardi et al (2023)	This study aims to observe patients suffering from OE consecutively, collecting data regarding the patient's demographic characteristics, signs and symptoms, frequency of OE episodes, risk factors, comorbidities, drug history, and any medication prescribed at the time of observation.	The sample in this study was 4365 patients.	This cross sectional study conducted a nationwide survey to evaluate the characteristics of patients affected by OE and analyze the most prescribed treatments.	The highest prevalence was at the age of 21-50 years (67%), and there were more males than females.

The analysis of risk factors for otitis externa revealed that 7 articles examined patient characteristics based on age (journals 1, 2, 3, 4, 5, 7, 9), and 9 articles discussed the characteristics of otitis externa itself (journals 1, 2, 3, 4, 5, 6, 8, 9, 10). Some strengths identified in several articles include the use of nationally or internationally representative data with recent editions, as well as adequate sample sizes for analyzing characteristics of otitis externa patients. Additionally, several variables that may serve as significant risk factors for otitis externa characteristics were identified, which is crucial for intervention efforts aimed at reducing otitis externa incidence and understanding the impact of these factors.

Researchers may tend to select data that aligns with their hypotheses, potentially influencing study outcomes and introducing bias. The available data sources in literature studies may not be comprehensive enough to address all research questions. Moreover, some articles may have limited population coverage, focusing only on specific otitis externa patient characteristics while excluding others, possibly introducing selection bias. Therefore, future research is recommended to employ improved methodologies, larger sample sizes, and inclusion of more variables to better investigate and mitigate otitis externa rates and associated risk factors.

Furthermore, six articles were identified that specifically discussed otitis externa patient characteristics based on age, with several indicating a significant relationship between age and otitis externa incidence (journals 1, 2, 3, 4, 5, 6, 8, 9, 10). Five articles reported higher incidence rates in males, while five articles highlighted higher incidence rates in females. Notably, six articles documented the highest incidence occurring in late adolescence (ages 17-30 years). Regarding

the types of otitis externa, seven articles (journals 1, 2, 3, 4, 5, 8, 9) predominantly identified diffuse otitis externa as the most common type, followed by four articles (journals 2, 5, 8, 9) mentioning circumscribed otitis externa, and one article discussing malignant otitis externa. Additionally, one article (journal 7) noted seasonal influences, with cases peaking in summer or during increased temperatures in August, and fewer cases in February due to lower temperatures.

Based on causative risk factors, trauma was mentioned in four journals (journals 1, 2, 3, 5, 7), and occupation-related factors such as ART workers and private employees were discussed in one journal (journal 9). One of the strengths identified in several articles was the relative efficiency in data collection, allowing researchers to gather comprehensive variables and measure prevalence for all factors simultaneously.

DISCUSSION

Based on research findings, it is concluded that otitis externa can occur in all age groups and genders, influenced by habits and ear conditions that are risk factors for its development. According to literature, occupations such as ART (Assisted Reproductive Technology) workers experience the highest incidence of otitis externa, followed by private sector workers. Additionally, the incidence of otitis externa in Indonesia is influenced by the increasing temperature in certain regions (Nieratschker et al., 2024).

The incidence of otitis externa is generally not influenced by gender, occurring equally among both sexes. This is because the pathophysiology of otitis externa is not affected by hormones. Research results indicate that the highest incidence of otitis externa is found in females, possibly due to anatomical differences. Male ear canals are typically longer, while females have shorter and narrower ear canals, which may increase the risk of infection. This difference could also be related to habits of ear cleaning, which are a known risk factor for otitis externa (Medina Salim et al., 2023). However, further research is needed to establish a definitive correlation between gender and otitis externa incidence.

Otitis externa is an acute bacterial infection of the skin in the ear canal, most commonly caused by Pseudomonas aeruginosa and Staphylococcus aureus. Based on several studies, the majority of cases are caused by gram-positive bacteria, particularly Pseudomonas aeruginosa, which thrives in various habitats including soil and water (Firman et al., 2022). This explains the high incidence of otitis externa among individuals frequently engaged in water activities such as swimming. The loss of protective mechanisms in the external ear canal due to decreased or absent cerumen, influenced by predisposing factors that alter pH levels from acidic to basic, increases the risk of bacterial infection.

CONCLUSION

In summary, otitis externa, an acute bacterial infection of the ear canal, affects individuals of all ages and genders, with risk factors including occupations involving water exposure like ART workers and environmental influences such as temperature variations. While gender differences in incidence exist, influenced by anatomical and hygiene factors, the condition primarily

stems from gram-positive bacteria like Pseudomonas aeruginosa and Staphylococcus aureus thriving in moist environments. Understanding these dynamics underscores the importance of tailored prevention strategies and treatment approaches to mitigate the impact of otitis externa globally.

FURTHER STUDY

This research should investigate gender and age-related risk factors for otitis externa, focusing on anatomical differences and hygiene practices. Research should also examine the impact of occupations with high water exposure and environmental factors like temperature on disease prevalence. Understanding these variables will aid in developing targeted prevention and treatment strategies.

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