Source details

Research Journal of Pharmacy and Technology

Scopus coverage years: 1997, 2005, from 2011 to 2022

Publisher: A and V Publication

ISSN: 0974-3618 E-ISSN: 0974-360X

Subject area: Pharmacology, Toxicology and Pharmaceutics: Pharmacology, Toxicology and Pharmaceutics (miscellaneous)

Medicine: Pharmacology (medical)

Source type: Journal

CiteScore 2021
1.3

SJR 2021
0.234

SNIP 2021
0.618

View all documents > | Set document alert | Save to source list

CiteScore | CiteScore rank & trend | Scopus content coverage

Improved CiteScore methodology

CiteScore 2021 counts the citations received in 2018-2021 to articles, reviews, conference papers, book chapters and data papers published in 2018-2021, and divides this by the number of publications published in 2018-2021. Learn more >

CiteScore 2021

$$1.3 = \frac{4{,}996 \text{ Citations 2018 - 2021}}{3{,}865 \text{ Documents 2018 - 2021}}$$

Calculated on 05 May, 2022

CiteScoreTracker 2022

$$1.3 = \frac{4{,}898 \text{ Citations to date}}{3{,}845 \text{ Documents to date}}$$

Last updated on 05 February, 2023 • Updated monthly

CiteScore rank 2021

Category	Rank	Percentile
Pharmacology, Toxicology and Pharmaceutics	#13/30	58th
Pharmacology, Toxicology and Pharmaceutics (miscellaneous)		
Medicine	#180/255	29th
Pharmacology		

View CiteScore methodology > | CiteScore FAQ > | Add CiteScore to your site

About Scopus

What is Scopus

Content coverage

Scopus blog

Scopus API

Privacy matters

Language

日本語版を表示する

查看简体中文版本

查看繁體中文版本

Просмотр версии на русском языке

Customer Service

Help

Tutorials

Contact us

ELSEVIER

Research Journal of Pharmacy and Technology

COUNTRY

India

Universities and research institutions in India

Media Ranking in India

SUBJECT AREA AND CATEGORY

Medicine
Pharmacology (medical)

Pharmacology, Toxicology and Pharmaceutics
Pharmacology, Toxicology and Pharmaceutics (miscellaneous)

PUBLISHER

A and V Publication

H-INDEX

47

PUBLICATION TYPE

Journals

ISSN

0974360X, 09743618

COVERAGE

1997, 2005, 2011-2021

INFORMATION

Homepage

How to publish in this journal

editor.rjpt@gmail.com

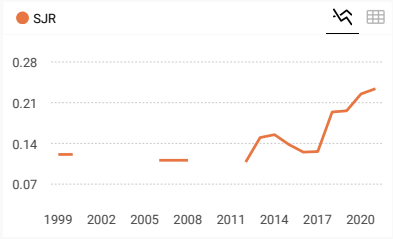
SCOPE

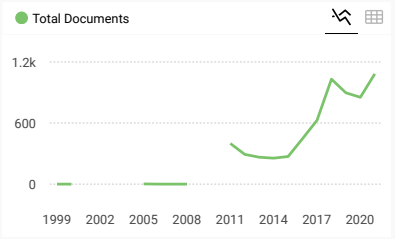
Research Journal of Pharmacy and Technology (RJPT) is an international, peer-reviewed, multidisciplinary journal, devoted to pharmaceutical sciences. The aim of RJPT is to increase the impact of pharmaceutical research both in academia and industry, with strong emphasis on quality and originality. RJPT publishes Original Research Articles, Short Communications, Review Articles in all areas of pharmaceutical sciences from the discovery of a drug up to clinical evaluation. Topics covered are: Pharmaceutics and Pharmacokinetics; Pharmaceutical chemistry including medicinal and analytical chemistry; Pharmacognosy including herbal products standardization and Phytochemistry; Pharmacology: Allied sciences including drug regulatory affairs, Pharmaceutical Marketing, Pharmaceutical Microbiology, Pharmaceutical biochemistry, Pharmaceutical Education and Hospital Pharmacy.

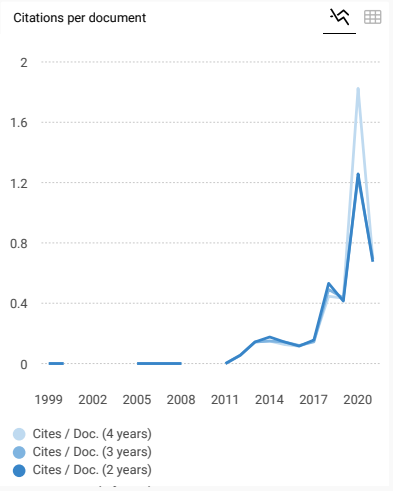
Quartiles

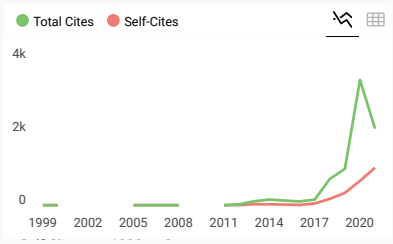
FIND SIMILAR JOURNALS options

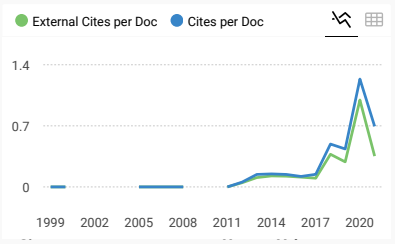
1	2	3	4	5
International Journal of Research in Pharmaceutical IND	**Journal of Applied Pharmaceutical Science** IND	**Indian Journal of Pharmaceutical Sciences** IND	**Brazilian Journal of Pharmaceutical Sciences** BRA	**Turkish Journal of Pharmaceutical Sciences** TUR
47% similarity	**44%** similarity	**43%** similarity	**41%** similarity	**40%** similarity

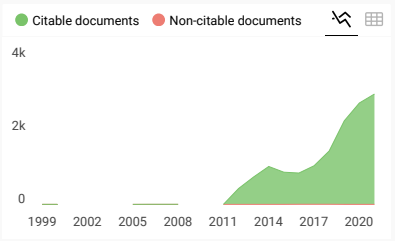


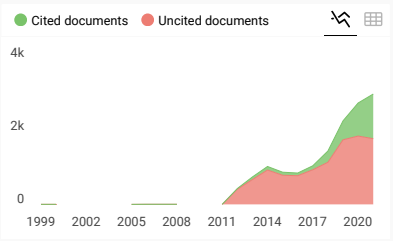












← Show this widget in your own website

Just copy the code below and paste within your html code:

```
<a href="https://www.scima
```

SCImago Graphica

Explore, visually communicate and make sense of data with our **new data visualization tool**.

Research Journal of Pharmacy and Technology
Year 2022, Volume-15, Issue-4 (April)
Print ISSN: 0974-3618
Online ISSN: 0974-360X

Table of Contents

Research Articles

Review Articles

Top

Editorial Board

Editors

Experts

Note: Please use Internet Explorer (6.0 or above). Some functionalities may not work in other browsers.

ISSN 0974-3618 (Print)
0974-360X (Online)

www.rjptonline.org

RESEARCH ARTICLE

Microbiological profile with Antibiotic Sensitivity Pattern for Chronic Suppurative Otitis Media in A Tertiary Hospital, Indonesia

Artono[1,2], Rahmi Surayya[2], Nyilo Purnami[2]*, Edi Handoko[3]

[1]Doctoral Program, Faculty of Medicine, Universitas Airlangga, Jl. Mayjen Prof. Dr. Moestopo No.47, Pacar Kembang, Tambaksari, Surabaya, Jawa Timur 60132, Indonesia.

[2]Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Airlangga, Dr Soetomo General Academic Hospital. Jl. Mayjen Prof. Dr. Moestopo No.6-8, Airlangga, Gubeng, Surabaya, Jawa Timur 60286, Indonesia.

[3]Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Brawijaya, Veteran Malang Road, Malang, Jawa Timur 65145, Indonesia.

*Corresponding Author E-mail: **nyilo@fk.unair.ac.id**

ABSTRACT:

Introduction: Chronic suppurative otitis media (CSOM) is a chronic inflammation in the middle ear and mastoid space that repeatedly secretes through the perforated membrane of tympanic disease over three months. This disease is a critical cause of hearing in developing countries. The prevalence of CSOM in Indonesia is 3.8%. Improper use of antibiotics leads to germicidal incidence. Understanding the pattern of germs and their antibiotic sensitivity will lead to a rational choice of antibiotics to prevent the emergence of resistance. **Aim:** to report the microbiological profile and sensitivity patterns in CSOM patients in our department. **Materials and Methods:** This is a retrospective descriptive study conducted on 45 patients from September 2019 - March 2020 at the ENT-KL Department of Dr Soetomo Surabaya Indonesia. Forty-five samples were collected from CSOM patients who underwent mastoidectomy. Specimens were collected from these patients, examination, isolation, examination and isolation antibiogram were carried out according to standard procedures. **Results:** A total of 45 samples were obtained from this study, and all (57.77%) of the patients were identified as CSOM cases with cholesteatoma. The number of women is 62.3% more than men, and the age group 12 to 16 (20.0%) is the most reported. There were 75.6% perforations in the tympanic membrane, and a central perforation was primarily found (35.6%). Most of the Schuller mastoid X-ray results showed sclerotic features in 29 patients (59.2%). Of the 45 ear swabs, about 68.89% of the surgical materials gave positive culture results, the remaining 31.11%. There was no microbial growth, where most of the growth of monomicrobial bacteria (57.8%). Of the isolates that grew, 70.58% were identified as the group of gram-negative bacteria, with Pseudomonas Aerogenosa isolates being the most common (44.11%). **Conclusion:** The sensitivity test showed the most sensitivity to Meropenam, Amikacin, Piperacillin-Tazobactam, Ceftasidim and Cefoperazone-Sulbactam Cefotaxime and Ceftriaxone showed lower sensitivity.

KEYWORDS: Chronic Suppurative Otitis Media, Sensitivity, Pseudomonas Aeroginosa, Infected, Human and Disease.

INTRODUCTION:

Chronic suppurative otitis media (CSOM) is chronic inflammation in the middle ear and mastoid space characterized by repeated discharge through the tympanic membrane's perforation for more than three months[1]. This disease is divided into CSOM with cholesteatoma and without cholesteatoma[2,3]. Chronic suppurative otitis media is still a significant problem worldwide because of its high morbidity and mortality[4]. The incidence of CSOM in developing countries is still high, especially in low socio-economic groups, dense living environments, poor hygiene, malnutrition, and inadequate health services[5]. The incidence of CSOM per year globally is estimated at 31 million, with 22% occurring in children aged less than five years[6]. The highest incidence of

Received on 26.03.2021 Modified on 13.06.2021
Accepted on 03.08.2021
Research J. Pharm.and Tech 2022; 15(4):1683-1688.
DOI: 10.52711/0974-360X.2022.00282

CSOM occurs in the first year of life, namely 15.4 new cases per 1,000 children per year[6]. The prevalence of CSOM varies in various countries, ranging from 4% to - 33.3%[4,6]. The high prevalence of CSOM (2-4%) is found in Nigeria, Korea, Thailand, Philippines, Malaysia, Vietnam, and China[4]. The prevalence of CSOM in Indonesia, in general, is 3.8% or around 6.6 million Indonesians[7]. CSOM patients constitute 25% of all patient visits to ENT polyclinics[8].

Chronic suppurative otitis media has a significant impact on hearing loss and can cause complications if not treated appropriately[9]. The use of antibiotics has reduced the incidence of CSOM complications, but the use of antibiotics incorrectly leads to germ resistance[9,10]. Therapy CSOM is a challenge in itself because the disease tends to recur easily, and the germs can quickly turn resistant. The patterns of germs and antibiotic sensitivity in CSOM patients differ from one place to another[9,11,12]. Understanding germs' pattern and their antibiotic sensitivity will lead to a rational choice of antibiotics to prevent the emergence of resistance[9,10]. This study aims to report the microbiological profile and antibiotic sensitivity patterns in CSOM patients.

MATERIAL AND METHOD:

This retrospective study was conducted at the Department of Otorhinolaryngology-Head and Neck Surgery in Dr Soetomo General Surabaya from September 2019 to March 2020 using a medical records database. This study used total sampling, namely all CSOM patients who underwent mastoidectomy with genetic anaesthesia who met the inclusion and exclusion criteria. Inclusion criteria were patients with complaints of ear secretions less than three months old and tympanic membrane perforation (MT). Exclusion criteria were patients with complaints of ear secretions for less than three months, intact MT, who had received systemic or local antibiotic therapy within the last week, and incomplete data. Samples were collected using two sterile swabs labelled with the patient's name and examined at the Clinical Microbiology Section. The first swab was used to make Gram stain smears, while the second swab was planted into Mac Conkey agar, blood agar, and chocolate agar for bacterial isolation, which was then incubated at 35-37˚C for 24-48 hours. Identification of pathogenic isolates was carried out microscopically by looking at colour, shape, cell structure, and colony characteristics, including colony morphology, hemolysis on blood agar, and agar media changes[13].

The organisms of each colony were cultured onto nutrient agar and continued with biochemical tests. Gram-positive isolates were tested with catalase and coagulase tests, while gram-negative isolates were tested with oxidase, triple sugar iron (TSI), sulfur indole and motility (SIM), urease production and citrate utilization[13]. Antibiotic sensitivity tests were carried out on Muller Hinton agar[14]. Identification of pathogens was based on microscopy (gram stain, shape, cell arrangement) and colony characteristics (colony morphology, hemolysis on blood agar, changes in the physical appearance of the differential media). Organisms from discrete colonies were cultured into nutrient agar (Oxoid, UK) for subsequent. Biochemical tests. Gram-positive isolates were tested for catalase and coagulase tests, while biochemical tests for gram-negative isolated bacteria were tested for oxidase, Triple sugar Iron (TSI), Sulfur indole and motility (SIM), urease production and citrate utilization[15]. According to the clinical and Laboratory Standard Institute (CLSI), antibiotic susceptibility patterns of isolated bacteria pathogens were performed using the modified Kirby Bauer disc diffusion method. A colony suspension with a concentration equivalent to 0.5 McFarland solution was prepared for each identified isolate and inoculated into Mueller – Hinton-Agar (Oxoid, UK). The selected antibiotic discs were appropriately placed onto the media and incubated at 37°C for 24 hour[16]. Data analysis was done using the Statistical Package for Social Sciences (SPSS) version 21. The p-value of <0.05 was considered statistically significant.

RESULT:

The results of this study describe the distribution of patients based on the diagnosis of CSOM type, demographics (including age, sex, and place of residence), clinical symptoms, comorbidities, clinical signs of CSOM, and the mastoid X-ray image presented in tabular form. Microbiological profiles of CSOM patients and analysis of germ patterns and antibiotic sensitivity are presented in tables and graphs. There were 45 participants diagnosed with CSOM with cholesteatoma 26 (57,8%) and 19 participants with CSOM without cholesteatoma (42,2%).

The age distribution was 6 years to 66 years, with a mean age of 31.00 (SD ± 17.8). The most CSOM incidence occurred in the age group from 12 to 16 (20.0%), followed by the age group 17 to 25 years (17.8%). Approximately 37.8% were male, and 62.3% were female, making the male to female ratio 1.0: 1.7.

Table 1. Patient Characteristics

Age (Year)	Gender				Total	
	Man		Woman		F.	%
	n	%	n	%	n	%
6 – 11	3	6.7%	2	4.4%	5	11.1%
12 – 16	4	8.9%	5	11.1%	9	20.0%
17 – 25	2	4.4%	6	13.3%	8	17.8%
26 – 35	3	6.7%	4	8.9%	7	15.6%
36 – 45	2	4.4%	3	6.7%	5	11.1%
46 – 55	2	4.4%	4	8.9%	6	13.3%
56 – 65	1	2.2%	2	4.4%	3	6.7%
> 65	0	0.0%	2	4.4%	2	4.4%
TOTAL	17	37,8%	28	62,2%	45	100,0%

All patients had complaints of hearing loss, and most of the patients had symptoms of otorrhea with a frequency of more than 5 times per year (68.9%). Clinical examination found that 75.6% of perforations in the tympanic membrane and central perforations were most found (35.6%). Schooler X-ray mastoid sclerotic features in 29 patients (59.2%). Bone erosion was present in 25 patients (45.5%).

Table 2. Characteristics of Sign, Symptom, Clinical Finding and Schuller's X-Ray Mastoid

Complaints and clinical signs	Frequency	Percentage
Hearing loss		
Light	18	40,0%
Affects daily life	27	60,0%
Otore		
Nothing	3	6,7%
<3 Times/ Year	4	8,9%
3-5 x/ Year	7	15,6%
>5 x/Year	31	68,9%
Physical examination	**Frequency**	**Percentage**
Tympanic membrane perforation		
Perforation	34	75,6%
Cannot be evaluated	11	24,4%
MT Perforation Location		
Central	16	35,6%
Atik/posterior superior	13	28,9%
Marginal	5	11,1%
Cannot be evaluated	11	24,4%
Schuller's X-Ray Mastoid	**Frequency**	**Percentage**
Pneumatisasi mastoid		
Pneumatik	2	4,4%
Diploik	14	28,6%
Sklerotik	29	59,2%
Bone Erosion		
No	25	55,5%
Yes	20	45,5%

There was the growth of monomicrobial germs in 26 patients (57.8%), polymicrobial in 5 patients (11.1%), and no growth of germs/sterility in 14 patients (31.1%). About 68.89 % of the operating materials gave positive culture results, the remaining 31.11%. No microbial growth was found (Table 3).

Table 3. Growth patterns of monomicrobial and polymicrobial germs

Germ growth	Frequency	Percentage
Monomicrobial	26	57,8%
Polymicrobial	5	11,1%
No germ growth / sterile	14	31,1%
Total	45	100%

In this study, a total of 24 isolates (70.58%) were identified as a group of gram-negative bacteria with *Pseudomonas aerogenosa* isolates the most being found, namely 44.11%, followed by *Proteus mirabilis* and *Providencia struartii* at 8.82%, and 5.88%. 12 isolates (29.42%) were gram-positive microbes, with the most types of isolates being *Staphylococcus epidermidis* and *Corynebacterium amycolatum*, each with 2 isolates (5.55%). 5 isolates were obtained. The growth of polymicrobial bacteria with various microbes was obtained, and the growth of *E coli* was obtained.

Table 4. Incidence of bacterial isolates

Positive Gram	**Frequency**	**Percentage**
1. *Enterococcus avium*	1	
2. *Staphylococcus epidermidis*	2	
3. *Streptococcus pygenes*	1	
4. *Staphylococcus hominis*	1	
5. *Corynebacterium amycolatum*	2	
6. *Staphlococcus aureus*	1	
7. *Streptococcus constellatus*	1	
8. *Staphylococcus coagulase*	1	
9. *Staphylococcus epidermidis*	1	
10. *Clostridium subterminale*	1	
Total	**12**	**31, 25 %**
Negative Gram	**Frequency**	**Percentage**
1. *Pseudomonas aeruginosa*	15	
2. *Citrobacter koseri*	1	
3. *Providencia struartii*	2	
4. *Providencia alcalifaciens*	1	
5. *Proteus mirabillis*	3	
6. *Proteus vulgaris*	1	
7. *Escherichia coli*	1	
Total	**24**	**67,75 %**
No Growth	**14**	

Table 5. Incidence of Polymicrobial combination of isolates

Negative Gram	**Freq uency**
1. *Ps. aeruginosa and Stap pyogenes*	1
2. *Citrobacter K and Stap hominis*	1
3. *E colli and Corynebacterium amycolatum*	1
4. *Ps.aeruginosa and Clostridium subterminale*	1
5. *Providencia alcalifaciens and Proteus mirabillis*	1
Total	5

Pseudomonas aeruginosa showed 93.33% sensitivity with Meropenam, Amikacin, Piperacillin-Tazobactam, Ceftasidim and Cefoperazone-Sulbactam. Meanwhile, showing very low sensitivity with Imipenem (6.66%), gentamicin (33.33%), with Cefotaxime and Ceftriaxone (13.33%) among the fluoroquinolones, ciprofloxacin showed a lower sensitivity of 33.33% and levofloxacin 40 %. *Proteus mirabilis* showed 100% sensitivity with Meronem, Amikacin, Piperacillin-Tazobactam, Ceftasidim and Cefoperazone-Sulbactam. Meanwhile, it showed very low sensitivity with Colistin and Ampicillin (33.33%). One *E coli* isolate was obtained, which showed 100% sensitivity of Meronem, Imipenem, Amikacin, Aztreonam, Ceftasidim, and Cefoperazone-Sulbactam. Meanwhile, it is resistant to Gentamycin, Amoxycillin, Ampicillin, Ampicillin-Sulbactam, Ceftriaxone, Cotrimoxazole, Chloramphenicol and all fluoroquinolones.

Table 6. Antibiotic susceptibility pattern

Antibiotik	Ps Aeruginosa (15)	Proteus Mirabilis (3)	Prudentia Struatii (2)	E Coli (1)	Corynebacterium Amilacatum (2)
Meropenem	14 (93,33%)	3 (100 %)	2 (100%)	1 (100%)	2 (100%)
Amikacin	14 (93,33%)	3 (100 %)	2 (100%)	1 (100%)	-
Gentamycin	5 (33,33 %)	3 (100 %)	0 (0%)	0	2 (100%)
Astreonam	3 (20 %)	2 (66,66 %)	2 (100%)	1 (100%)	-
Amoixcillin-Clavulanic Acid	1 (6,66 %)	2 (66,66 %)	0 (0%)	0 (0%)	1 (50%)
Ampicilin	1 (6,66 %)	1 (33,33%)	0 (0%)	0 (0%)	-
Ampicillin-Sulbactam	1 (6,66 %)	3 (100 %)	1 (50%)	0 (0%)	-
Piperacillin	80 %	2 (66,66 %)	1 (50%)	0 (0%)	-
Piperacillin-Tazobactam	14 (93,33%)	3 (100 %)	2 (100%)	-	-
Cephazolin	1 (6,66 %)	3 (100 %)	0 (0%)	-	-
Cotrimoxazol	-	2 (66,66 %)	2 (100%)	0 (0%)	0 (0%)
Ceftazidimie	14 (93,33%)	3 (100 %)	2 (100%)	1 (100%)	-
Cefotaxime	2 (13,33 %)	2 (66,66 %)	1 (50%)	1 (100%)	2 (100%)
Ceftriaxone	2 (13,33 %)	3 (100 %)	2 (100%)	0 (0%)	-
Cefoperazone-Sulbactam	14 (93,33%)	3 (100 %)	1 (50%)	1 (100%)	-
Tetracyclin	1 (6,66 %)	3 (100 %)	0 (0%)	1 (100%)	-
Tigecyline	4 (26,66 %)	3 (100 %)	1 (50%)	1 (100%)	-
Chloramphenicol	1 (6,66 %)	2 (66,66 %)	0 (0%)	0 (0%)	0 (0%)
Ciprofloxacin	5 (33,33 %)	3 (100 %)	1 (50%)	0 (0%)	-
Levofloxacin	6 (40 %)	-	1 (50%)	0 (0%)	0 (0%)
Moxifloxacin	-	3 (100 %)	1 (50%)	0 (0%)	-
Imipenem	1 (6,66 %)	-	-	-	-
Colistin	-	1 (33,33%)	-	-	-
Fosomycin	-	-	1 (50%)	-	-
Oxacilin	-	-	-	-	0 (0%)
Penicilin-G	-	-	-		0 (0%)
Erythromycin	-	-	-		1 (50%)
Clindamycin	-	-	-		0 (0%)

DISCUSSION:

Chronic suppurative otitis media is a chronic infectious disease that is a worldwide health problem, especially in developing countries[13,17]. Chronic suppurative otitis media is an infection of the middle ear and mastoid cavity characterized by the persistent discharge from the middle ear and perforation tympanic membrane[14,17]. Prompt and precise diagnosis and management are critical to prevent complications[13]. CSOM is generally divided into CSOM with cholesteatoma and without cholesteatoma[2,3]. In this study, the proportion of CSOM patients with CSOM cholesteatoma more than CSOM without cholesteatoma (1.3:1). This is consistent with previous research[18]. This study is different from the research of Lisa and Haidar[19]. CSOM with cholesteatoma, which is more common in this study, may be associated with the precedence of operative action in CSOM with cholesteatoma. The patients' age in this study ranged from 6 to 66 years, with most patients in the age range 12 to 16 years (20%). The results of this study are almost the same as previous studies[1,9,20-22]. Chronic suppurative otitis media is a disease that is often found in young adults, and about 50% of patients are between 11-30 years of age[23]. CSOM is usually present since childhood but is mainly detected in adulthood young. Things like young patient awareness of the illness, pre-employment treatment, or accessibility to the hospital are easier for this age group.

The study found that CSOM was more common in women than in male patients with a ratio of 1.6: 1. This ratio is not entirely different from Prakash's study, which found a female to male ratio of 1.2:1[22]. Several researchers reported different results[13,14]. The dominance of women in this study may be an incidental finding. No anatomical or genetic differences have been found related to women and men's ears to explain the differences in the incidence of CSOM in men and women[13].

In this study, all patients had hearing loss complaints, and most of the patients had otorrhea more than 5 times per year. In this study, complaints of hearing loss were found in all patients, followed by otorrhea complaints. Several researchers reported different findings of where otorrhea was the leading complaint[19,20]. Otorrhea and hearing loss are the two main symptoms of CSOM that patients often complain of hearing loss and are the most frequent sequel to CSOM, which can be conductive hearing loss or sensory neural hearing loss[5,17,20,21]. Otore often causes embarrassment and inferiority in patients, while hearing loss is often an obstacle to learning and work, so they tend to seek treatment more quickly.

MT perforation was found in 75.6% of patients with the most central location of the perforation, namely 35.6%, and this is following several investigators[8,13,20]. MT perforation is essential for evaluation in CSOM because

it is associated with otorrhea and hearing loss complaints[17,20]. In Schuller's X-ray evaluation, it was found that most pneumatization was the sclerotic type (64%) and the presence of bone erosion (44.5%). Pneumatization is defined as the process of forming air spaces in the temporal bone. Mastoid pneumatization decreases as a chronic infection of the middle ear worsen[23,24]. The mastoid air cell system makes an essential contribution to middle ear ventilation[24,25]. Bone erosion can occur in CSOM with and without cholesteatoma. In CSOM with cholesteatoma, the accumulation of keratin in the middle ear and mastoid cavity results in damage to the surrounding bone structures[3]. The growth pattern of germs in this study consisted of 57.8% monomicrobial, 11.1% polymicrobial, and no germ growth of 31.1%. The culture results found 16 kinds of germs with *Pseudomonas aeruginosa* as the most prominent bacteria, 35.1%, followed by *Proteus mirabilis* 10.8%, *Staphylococcus epidermidis*, *Providencia stuartii*, and *Corynebacterium amycolatum*, respectively 8.1%, and *E. coli* bacteria were found.

In this study, the results of polymicrobial isolates were less than polymicrobial. This is probably because topical and systemic broad-spectrum antibiotics in the period before the study may have resulted in lower polymicrobial infections[1]. The discovery of polymicrobial may explain that eardrum perforation facilitates such as *Escherichia coli* and *Pseudomonas aeruginosa* associated with wet and poor hygiene of the outer ear migrates to the middle ear and reproduces[13]. Most authors elsewhere have reported *Pseudomonas aeruginosa* as a common isolate. This study follows Juyal, who found *Pseudomonas aeruginosa* 32.1% as the most bacteria in CSOM(5). Google and Harshika's research also found that the highest *Pseudomonas aeruginosa* was in CSOM, namely 53.91% and 33.09%[1,14]. This study was different from Mofatteh, who found Staphylococci spp at 64.9%[9]. A study by VK Pooreyetal, Pseudomonas pyocyaneus in 35.2% of cases was the most frequently isolated organism, followed by Klebsiella aerogenes in 25.4% and Staphylococcus aureus in 14.7% of cases[26]. This study was also different from Hafizah, who received the most Proteus sp[12,27]. This study was different from Mofatteh, who found the most Staphylococci spp. 64.9%[9]. In a study from Agartala, Pseudomonas (37.73%) was the most isolated bacteria, followed by Escherichia coli (20.75%) and Staphylococcus aureus (20.75%) of the cases[28]. *Pseudomonas aeruginosa* is the main pathogen that is often found in CSOM[5]. This pathogen is not included in the commensal germs in the upper respiratory tract, so that its presence in the middle ear cannot be attributed to invasion through the Eustachian tube[5,9]. Other factors, such as poverty, hygiene, and unconventional ear drop, such as oil and honey to the middle ear, contribute to their presence in the middle ear[5]. *Pseudomonas aeruginosa* is difficult to treat because these bacteria can grow in various environmental or nutritional conditions and are resistant to antibiotics[5,29]. These bacteria can also escape from the host's defence system by forming a shell of damaged epithelium around it, so that blood circulation to the area decreases[1,17]. Organisms can damage tissues, disrupt normal body defences, and produce enzymes and damage so that antibiotics become inactive[1,5].

Pseudomonas aeruginosa growing well in the ear can cause bone necrosis and mucosal disease[5]. The next most common organism isolated was Proteus mirabilis 3 (6.09%), following Gul's findings[30]. In this study, the Escherichia coli bacteria were also found. Isolation of Escherichia coli coliform bacteria known to be faecal bacteria, and *Pseudomonas aeruginosa*, which is associated with wet environmental conditions, indicates that people are at high risk of infection due to a poor hygienic environment. Patterns of antibiotics that serve as the right original electrical currents for CSOM therapy[5]. This study found that *Pseudomonas aeruginosa* was 90% sensitive to imipenem, ceftazidime, amikacin, and meropenem. The sensitivity of these microbes to cefoperazone-sulbactam and Piperacillin was 75%. This study follows Ghogare, who found that 89% of *Pseudomonas aeruginosa* is sensitive to imipenem, 70% sensitive to Piperacillin, and 67% sensitive to amikacin[1]. Harshika's research found that *Pseudomonas aeruginosa* is sensitive to amikacin and imipenem, Piperacillin, gentamicin, tobramycin, and cefuroxime[14]. Juyal's research found *Pseudomonas aeruginosa* was sensitive to piperacillin-tazobactam, amikacin, imipenem, and cefepime[5]. This study found that 90% of *Pseudomonas aeruginosa* were resistant to amoxicillin-clavulanic acid, cefazolin, ceftriaxone, cotrimoxazole, and tetracyclines. These bacteria are 75% resistant to ampicillin, ampicillin-sulbactam, and cefotaxime. The resistance of *Pseudomonas aeruginosa* to ceftriaxone and cotrimoxazole was also found in Mofatteh's study[9]. This study was different from Juyal, who found the highest resistance of *Pseudomonas aeruginosa* to fluoroquinolones (48.7%), penicillin (41.7%), aminoglycosides (38.0%), and cephalosporins (29.4%)[5]. The type of bacteria and antibiotic sensitivity in CSOM varies from region to region, managed by geographic location and other factors. Increasing prevalence of antibiotic resistance for inappropriate use of antibiotics[9,12]. The selection of antibiotics based on culture results and sensitivity is an effective therapeutic modality to prevent resistance[9,32].

CONCLUSION:

Pseudomonas aeruginosa is the microorganism that is most often found in this study. The pattern of sensitivity of *Pseudomonas aeruginosa* shows the level of resistance of this organism to the antibiotics used. This study found that 90% of *Pseudomonas aeruginosa* was resistant to amoxicillin-clavulanic acid, cefazolin, ceftriaxone, cotrimoxazole, and tetracyclines but sensitive to imipenem, ceftazidime, amikacin, and meropenem. The development and widespread use of antibiotics can change pathogenic microorganisms and their resistance to antibiotics. Ear secretion culture examination is helpful as a guide for the proper administration of antibiotics to prevent the emergence of resistant microbial strains. Data on germs and their sensitivity to antibiotics can formulate policies for local antibiotic use in an institution.

ETHICAL CLEARANCE:

Ethical clearance was obtained from the Research and Publications Committee of Dr Soetomo General Hospital.

CONFLICT OF INTEREST:

The authors declared there is no competing interest in the study.

REFERENCES:

1. Ghogare H, Vitore V, Hatkar S, Bhalchandra MH, Wyawhare AS, Bansal VP. Microbiological Profile of Chronic Suppurative Otitis Media. Int J Curr Microbiol App Sci. 2018;7(10):1152–9.
2. Arts HA, Neely JG. Intratemporal and intracranial complications of otitis media. Head neck surgery-otolaryngology Philadelphia Lippincott Williams Wilkins. 2014;2399–409.
3. Yorgancilar E, Akkus Z, Gun R, Yildirim M, Bakir S, Kinis V, et al. Temporal bone erosion in patients with chronic suppurative otitis media. B-ENT. 2013;9(1):17–22.
4. Acuin J, World Health Organization (WHO). Chronic suppurative otitis media : burden of illness and management options. Geneva. 2004;
5. Juyal D, Sharma M, Negi V, Prakash R, Sharma N. *Pseudomonas aeruginosa* and its sensitivity spectrum in chronic suppurative otitis media: A study from Garhwal hills of Uttarakhand State, India. Indian J Otol. 2017;23(3):180.
6. Schilder AGM, Chonmaitree T, Cripps AW, Rosenfeld RM, Casselbrant ML, Haggard MP, et al. Otitis media. Nat Rev Dis Prim. 2016 Sep;2(1):16063.
7. Lisa AN, Wibawa FS. Karakteristik Penderita Otitis Media Supuratif Kronis (Omsk) Di Poliklinik Tht-Kl Rsud Dr. H. Abdul Moeloek Bandar Lampung Periode Januari 2013-Desember 2014. 2014.
8. Lisa A., Wibawa F. Karakteristik Penderita Otitis Media Supuratif Kronis (OMSK) Di Poliklinik THT-KL RSUD DR. H. ABDUL MOELOEK Bandar Lampung Periode Januari 2013-Desember 2014. J Chem Inf Model. 2019;53(9):1689–99.
9. Mofatteh MR, Moghaddam FS, Yousefi M, Namaei MH. A study of bacterial pathogens and antibiotic susceptibility patterns in chronic suppurative otitis media. J Laryngol Otol. 2018;132(1):41–5.
10. Viswanatha B. Microbiology of Chronic Suppurative Otitis Media: A Prospective Study in a Tertiary Care Hospital. J Otolaryngol Res. 2017;9(1):1–4.
11. Asroel HA, Siregar DR, Aboet A. Profil of Patient with Chronic Suppurative Otitis Media. J Kesehat Masy Nas. 2010;7(17):567–71.
12. Hafizah H, Qamariah N, Budiarti LY. Perbandingan sensitivitas bakteri aerob penyebab otitis media supuratif kronik tipe benigna aktif tahun 2008 dan 2012. Berk Kedokt. 2016;9(1):75–83.
13. Abraham ZS, Ntunaguzi D, Kahinga AA, Mapondella KB, Massawe ER, Nkuwi EJ, et al. Prevalence and etiological agents for chronic suppurative otitis media in a tertiary hospital in Tanzania. BMC Res Notes. 2019;12(1):429.
14. Harshika YK, Sangeetha S, Prakash R. Microbiological profile of CSOM and their antibiotic sensitivity pattern in a tertiary care hospital. Int J Curr Microbiol App Sci. 2015;4(12):735–43.
15. Tiedt NJ, Butler IRT, Hallbauer UM, Atkins MD, Elliott E, Pieters M, et al. Paediatric chronic suppurative otitis media in the Free State Province: Clinical and audiological features. South African Med J. 2013;103(7):467–70.
16. Bauer AW. Antibiotic susceptibility testing by a standardized single disc method. Am J clin pathol. 1966;45:149–58.
17. Mittal R, Lisi C V, Gerring R, Mittal J, Mathee K, Narasimhan G, et al. Current concepts in the pathogenesis and treatment of chronic suppurative otitis media. J Med Microbiol. 2015;64(Pt 10):1103.
18. Dewi PCS, Ahadiah TH, Ekorini HM. Perbandingan bone conduction pada penderita otitis media supuratif kronik dengan kolesteatoma dan tanpa kolesteatoma. Oto Rhino Laryngol Indones. 2018;48(1):18–25.
19. Haidar H, Sheikh R, Larem A, Elsaadi A, Abdulkarim H, Ashkanani S, et al. Ossicular chain erosion in chronic suppurative otitis media. Otolaryngol (Sunnyvale). 2015;5(203):2.
20. Kumara A, Nigam R, Jain AK. Chronic suppurative otitis media: A clinicopathological study at a tertiary care hospital. IJAR. 2015;1(10):235–40.
21. Veeranjaneyulu P, Kumar YA, Anisha KR, Devi PK. Clinicopathological correlation in chronic suppurative otitis media. J Clin Diagnostic Res. 2017;11(11):MC01–4.
22. Prakash R, Juyal D, Negi V, Pal S, Adekhandi S, Sharma M, et al. Microbiology of chronic suppurative otitis media in a tertiary care setup of Uttarakhand state, India. N Am J Med Sci. 2013;5(4):282.
23. Roy A, Deshmukh PT, Patil C. Pneumatization pattern in squamousal type of chronic otitis media. Indian J Otolaryngol Head Neck Surg. 2015;67(4):375–80.
24. Masdarinah A. Hubungan Lama Sakit dengan Tipe Pneumatisasi Mastoid Penderita Otitis Media Supurative Kronik. Medica Hosp J Clin Med. 2016;4(1).
25. Sunitha M, Asokan L, Sambandan AP. A comparative study of plain x-ray mastoids with HRCT temporal bone in patients with chronic suppurative otitis media. J Evol Med Dent Sci. 2015;4(30):5190–8.
26. Poorey VK. Study of bacterial flora in CSOM and its clinical significance. Indian J Otolaryngol Head neck Surg. 2002;54(2):91–5.
27. Ferede D, Geyid A, Lulseged S, Melaku A. Drug susceptibility pattern of bacterial isolates from children with chronic suppurative otitis media. Ethiop J Heal Dev. 2001;15(2).
28. Kumar D, Agrawal A, Kumar S, Gupta N. " A Study of the Microbiological Profile of CSOM in A Tertiary Care Centre of North India ." 2019;18(5):20–4.
29. Gellatly SL, Hancock REW. *Pseudomonas aeruginosa*: new insights into pathogenesis and host defenses. Pathog Dis. 2013;67(3):159–73.
30. Gül HC, Kurnaz A, Turhan V, Oncül O, Pahsa A. Microorganisms isolated from middle ear cultures and their antibacterial susceptibility in patients with chronic suppurative otitis media. Kulak burun bogaz Ihtis Derg KBB= J ear, nose, throat. 2006;16(4):164–8.
31. Abraham ZS, Ntunaguzi D, Kahinga AA, Mapondella KB, Massawe ER, Nkuwi EJ, et al. Prevalence and etiological agents for chronic suppurative otitis media in a tertiary hospital in Tanzania. BMC Res Notes [Internet]. 2019 Dec 17 [cited 2019 Sep 24];12(1):429. Available from: https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-019-4483-x
32. Mohammed EH, Zimam EH. Synthesis Characterization and Studying Antibacterial Activity of some New Pyrazol Derivatives. Research Journal of Pharmacy and Technology. 2021 Jul 1;14(7):3905-10.