DOI: https://doi.org/10.53555/nnmhs.v8i12.1478 Publication URL: https://nnpub.org/index.php/MHS/article/view/1478

MANAGEMENT OF CHRONIC SUPURATIVE OTITIS MEDIA PATIENTS WITH INTRACRANIAL COMPLICATION AT DR. HASAN SADIKIN CENTRAL GENERAL HOSPITAL

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Abstract

Background: Chronic suppurative otitis media (CSOM) is an inflammatory process due to infection of the mucoperiosteum of the middle ear cavity which is characterized by perforation of the tympanic membrane and discharge of secretions. An important problem that arises due to CSOM is intracranial complications that can cause death, so it is necessary to know the characteristics of CSOM patients with intracranial complications.

Methods: This study was a retrospective descriptive study on CSOM patients with intracranial complications who were treated at Dr. Hasan Sadikin central general hospital, in the period January 1, 2014 - December 31, 2019.

Results: A total of 39 CSOM patients with intracranial complications in the period 1 January 2014 - 31 December 2019. After exclusion, there were 33 total samples in this study. The group after the most was 18-34 years and it was more common in men. The chief complaint from the most patients was headache and as many as 30 people did not have comorbid diseases, and as many as 15 people experienced complications of subdural abscess.

Conclusion: From the results of this study it was concluded that there were significant differences based on gender, age, and educational background. The most common complaint of patients was headache, without comorbidities, and the most common complication was subdural abscess, and the duration of time from otitis media to intracranial complications was >5 years.

Keywords: *Chronic suppurative otitis media, intracranial complications, craniotomy, canal wall do*

INTRODUCTION

Chronic suppurative otitis media is an inflammation process caused by infection of middle ear cavity mucoperiosteum that is characterized by tympanic membrane perforation, continuous or disappearing secret discharge, and may cause permanent pathological changes.

inflammation of the middle ear canal (Eustachian tube, mastoid, and middle ear) and its complication is frequently found in children. Late and inaccurate management, presence of overdue and inaccurate management, high bacterial virulence, weak body resistance toward bacteries, bad nutritional status, low rate of hygiene and education, increase the inflammation of upper respiratory tract, which increases the rate of middle ear infection.

Accite middle ear infection that does not receive proper management, will continue into chronic middle ear infection. Complication of chronic ear infection may occur due to inadequate management, high bacterial virulence, or patient's low immune system. complication that may occur is divided

Incidence rate of CSOM is split in two, intracranial and extracranial complication. Intracranial complication that is found frequently is meningitis (34%), brain abscess (25%), hydrocephalus otitis (12%), cavernous sinus thrombosis (10%), extradural abscess (3%), petrositis (3%), and subdural abscess (1%). incidence rate of intracranial complication is much decreased concomitant with the use of antibiotics, from 35% in 19th century to 5% in 20th century.[4]

Incidence rate of CSOM with intracranial complication is mostly caused by the presence of cholesteatoma that causes bone detruction, particularly mastoid tegmen, that confine the mastoid cavity from the intracranial. So that, if that barrier bone is damaged, infection process will easily enter the brain cavity. Duramates is an extremely strong brain wrapping layer, so the infection process enter the brain cavity.

Death threat in CSOM with intracranial complication is extremely high, so it reaquires a proper and immediate management and collaboration with other scientific field, such as neurosurgery

RESEARCH METHOD

This study is a retrospective descriptive study conducted at the Dr. Hasan Sadikin central general hospital over a period of 6 years from January 1, 2014 through December 31, 2019 using medical records of hospitalized patients. The sample was taken by total sampling with the inclusion criteria of CSOM patients with intracranial complications who had complete medical record data and the exclusion criteria were patients with incomplete, missing, or unclear medical record data. The variables studied were patient characteristics (gender, age, educational history), the chief complaints, comorbid disease, type of intracranial complications, duration of CSOM, intracranial complications, type of Treatment and outcomes.

RESULTS

There were 39 CSOM patients with intracranial complications (0.6%) of the total number of patients diagnosed with CSOM at Dr. Hasan Sadikin central general hospital for a span of 6 years. Of the 39 patients, there were 6 patients with incomplete medical record data, so as many as 33 CSOM patients with intracranial complications were included in this study. The youngest age was 16 years old and the oldest age was 45 years old, with an average age of 37.4 years old. The number of male patient (82%) more than women (18%) and patients with lower education level (SD, SMP, SMA) (66.6%) more than patients with higher education.

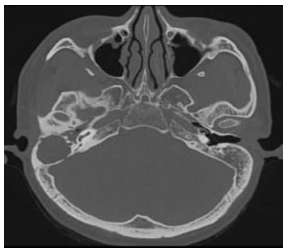

Figure 1. Axial CT scan of a patient with chronic suppurative otitis media

Among the loss of consciousness and seizures, headache was the most common complaint (72.7%). Most of the patients had no comorbidities, but there were 3 patients who had comorbid diabetes mellitus.

Table 1. Types of intracranial complications

Types of Intracranial Complications	n (%)
Meningitis	3 (9,1%)
Subdural Abscess	15 (45,5%)
Cerebral Abscess	11 (33,3%)
Hydrocephalus	4 (12,1%)

From table 1 above, it appears that the most intracranial complications are subdural abscess and meningitis are owned by the least number of patients with CSOM.

Figure 2. Axial CT scan of patient with subdural abscess (a), cerebral abscess (b)

Table 2. Duration of OM to intracranial complications

Duration	n (%)
3 months – 1 year	2 (6,1%)
>1 year – 5 years	7 (21,2%)
>5 years	24 (72,7%)

Table 2 demonstrates that the time gap between the onset of OM and the incidence of the most intracranial problems is >5 years, with an average of 10.7 years.

All patients had intravenous cephalosporin antibiotics for 6 weeks, as well as canal wall down (CWD) surgery by T.H.T.K.L. and a neurosurgeon's evacuation craniotomy. A total of 22 patients (66.6%) had evacuation craniotomy surgery followed by CWD, 9 patients (27.3%) had evacuation craniotomy and CWD surgery at the same time, and 2 patients (6.1%) had CWD surgery before surgery. craniotomy for the removal of the brain.

Two individuals died after therapy, while the others improved. In a 6-month follow-up study, 27 patients reported no otorrhoea and four patients reported otorrhoea.

DISCUSSION

The findings of this study show that there were substantial disparities in the number of male and female CSOM patients with intracranial problems from January 1, 2014 to December 31, 2019. These findings are consistent with a study done by Meis Malirmasele et al. at the hospital dr. M. Haulussy Ambon, which found that out of 54 patients, there were more male patients (51.9%) than female patients. Because guys interact with their surroundings more frequently than girls, they are more vulnerable to infectious pathogens.[5] Men are also more likely than women to smoke, which is considered to be one of the predispositions for upper respiratory tract infections.

In this study, the majority of CSOM patients with intracranial problems were of working age, with an average age of 37.4 years. Children and young adults are more likely to develop chronic suppurative otitis media. CSOM usually always begins with recurrent otitis media in children, and only rarely occurs in adults. Infectious agents generally enter the middle ear through the Eustachian tube from the nasopharynx. Infectious agents generally enter the middle ear through the Eustachian tube from the nasopharynx. Low immune function makes middle ear infections more common.[2,3] The findings of this study are consistent with a study done by Yuliani Mardiati Lubis et al at H. Adam Malik Hospital Medan, which found that the largest incidence occurred in the 22-31 year old age group out of 75 patients (38.7%).[6]

It is found that CSOM happens more frequently in patients with a middle to low level of education due to the fact that the knowledge of the patient is low, causing them to not give too much attention to the disease that they have, resulting in them not getting treatment faster than others. This result is the same with a result that is being held in RSUD dr. M. Haulussy Ambon, which concludes that CSOM tends to happen on people with a low education or knowledge level.[5]

The highest proportion based on the chief complaint of the patient is headaches with as many as 24 people complaining about it (72,7%). This is caused by compressions on the organs in the head, as well as strain from the duramater, thus causing headache to occur.[4]

In this research, the most common comorbid disease to appear alongside CSOM with intracranial complications is diabetes mellitus that happened on 3 patients. So far, experts have not found an explanation regarding how diabetes mellitus affects the number of chronic suppurative otitis media with intracranial complication incidences. It is predicted that diabetes mellitus increases the patient's vulnerability against infection due to metabolic disorders.[7]

Based on intracranial complication diseases, the biggest proportion is subdural abscess and the least to occur on patients is meningitis. This result is different from a research done by Kan and Tyagi, as well as other sources, which stated that meningitis is the most common intracranial complication from chronic suppurative otitis media .[8] Meningitis complication

is less likely to happen because the dura mater that is not too vascularized and thicker than other brain layers, therefore it would cause pathogens to not be able to penetrate the dura mater and happened more frequently in the subdural layer that would eventually cause subdural abscess.[4,9]

Middle ear infections tend to spread on regions that are affected by the pathogen's virulence, host resistance, adequate antibiotic therapy, anatomical barrier and pneumatic space drainage. The extra and intracranial complication pathway consists of nearby cranial bone thrombophlebitis venula, bone erosion due to pressure or enzymatic activity, pathway that is already formed and hematogen. The middle ear bone barrier can undergo erosion via osteitis, granulation or cholesteatoma. This condition causes infection to spread intracranially.[9]

From this research, it is found that the longest duration between otitis media until intracranial complications can reach around >5 years. Those CSOM incidences almost always start with repeated otitis media on children, and rarely begin after adult. This result could have happened because there are several patients that actually has a history of fluids going out from their ears (otorrhea) since they are a child and begins when they have become adults with those complaints and diagnosed with CSOM that may be a continuation from a complaint that has happened when they are a child. Besides that, there are also other factors affecting it such as inadequate treatment, unfinished treatment, patient delaying treatment, pathogen virulence that keeps on increasing with the improper use of antibiotics, as well as low patient resistance.[3,10]

All patients in this study were treated with cephalosporin antibiotics and canal wall down (CWD) surgery by Otorhinolaryngology-Head and Neck Surgery and evacuation craniotomy by a neurosurgeon. The choice of the use of cephalosporin antibiotics because it is a broad spectrum antibiotic, besides that based on research it was found that the most common bacteria causing CSOM was Staphylococcus sp and cephalosporin antibiotics were the most effective against Staphylococcus sp. 11 There were 22 patients underwent evacuation surgery craniotomy first, followed by CWD which aimed for decompression and contain the spread of infection by evacuating the pus and its capsule. The remaining 9 patients underwent evacuation craniotomy and CWD simultaneously because when CWD was performed, the pus immediately came out through the mastoid antrum. The remaining 2 patients underwent CWD surgery prior to the evacuation craniotomy operation, because it was suspected that the abscess was immature, so it was hoped that by giving antibiotics first, the abscess capsule could mature. These results are in line with a study conducted by Neeta Sherma, et al at Bhilai Hospital, India which stated that of 26 CSOM patients who had intracranial complications of cerebral abscess, all of them underwent intracranial drainage before mastoidectomy. 12 After treatment, 2 patients died. namely patients with complaints of decreased consciousness and complications of meningitis. This happened probably because sepsis had already occurred which worsened the patient's condition.[9]

CONCLUSION

The highest proportion of patients with chronic suppurative otitis media with intracranial complications by sex was male with an average age of 37.4 years. The highest proportion of CSOM patients with intracranial complications based on the latest level of education is patients with lower secondary education background.

The chief complaint in CSOM patients with intracranial complications is headache and most of them are not accompanied by comorbid diseases. The most common intracranial complications were subdural abscess followed by cerebral abscess, with the duration of experiencing OM until intracranial complications occurred for >5 years. With adequate management, CSOM with intracranial complications can be treated and the patient can return to normal activities. Administration of intravenous cephalosporin antibiotics for 6 weeks, canal wall down surgery (CWD) and evacuation craniotomy gave satisfactory results as the management of CSOM with intracranial complications.

Preventive action and also good and comprehensive management in CSOM cases, especially CSOM with intracranial complications are needed to eradicate the focus of infection and prevent the occurrence of more severe conditions.

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