**ABSTRACT**

**Introduction:** Liver abscess (LA) is the formation of a pus-filled cavity in the liver parenchyma due to bacterial, fungal, or parasitic infection and is one of the most common tropical diseases of the gastrointestinal tract. Liver abscesses are classified as pyogenic liver abscess (PLA) or amoebic LA. Antibiotics and drainage are first and most important in managing hepatic abscesses. This study aims to determine the profile of hepatic abscess patients at Dr. Soetomo General Hospital, Surabaya, 2017-2022.

**Method:** This research is an observational study with a cross-sectional research design. The data of this study were collected from medical records of patients with pyogenic hepatic abscesses at Dr. Soetomo General Hospital, Surabaya, in 2017-2022.

**Results:** This study found liver abscesses more common in patients aged 31-40 (27.5%). Male subjects with hepatic abscesses showed a higher percentage (82.5%) than females (17.5%). Most patients performed subcutaneous drainage management in 26 (65%) subjects, while 14 (35%) subjects performed surgical drainage. Bacterial cultures were performed on 40 patients diagnosed with hepatic abscess, and 6 cultures (15%) had no bacterial growth, while 34 cultures (85%) had microorganism growth. Of the 34 cultures with bacterial growth, the most bacterial growth was *Candida albicans* (2.5%) and *Pseudomonas sp.* (2.5%).

**Conclusion:** In this study, hepatic abscess patients at Dr. Soetomo General Hospital, Surabaya, in 2017-2022, mainly occurred in patients aged 31-40 and female. In addition, this study also showed that most patients were treated with subcutaneous drainage compared to surgical drainage. Bacterial growth cultures were found in most patients, with *Escherichia coli* bacteria being the most prevalent.

**Keywords:** pyogenic liver abscess, percutaneous drainage, surgical drainage.

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**INTRODUCTION**

Liver abscess occurs in 3–9% of the infected population, which is highly prevalent in Indonesia. Hygiene and sanitation are two risk factors that play the most role in liver abscesses. Men in their 30s to 40s are the age group with the highest incidence of liver abscesses.¹ In the event of a liver abscess, there is a risk of recurrence and death. The recurrence rate varies from 2% to 23.8%, and the death rate ranges from 3% to 30%. Rupture of abscesses into the chest and pericardium, or intra-abdominally, may occur. Large-size and left-lobe abscesses are more likely to rupture. Rupture can impact the bronchi, lungs, pericardium, pleural cavity, and in the abdomen, into the peritoneal cavity, stomach, or large intestine.²

Liver abscesses based on etiology are divided into two types, namely pyogenic liver abscess (PLA) and amoebic liver abscess (ALA), caused by the *Entamoeba histolytica* parasite.³ However, the differences in symptoms between the two are almost similar and difficult to differentiate. Antibiotics and drainage are the first and most important treatments for liver abscesses. Currently, surgical techniques are number two in the treatment of liver abscesses. Appropriate antibiotics are administered based on culture. Antibiotic treatment should be initiated while awaiting culture, and broad-spectrum antibiotics should be used. A map of the reported germs causing liver abscesses should help determine the initial antibiotic choice. The administration of antibiotics must be appropriate and not excessive to avoid resistance.³ Our study aims to determine the profile of liver abscess patients at Dr. Soetomo General Hospital, Surabaya.

**METHOD**

This research was a cross-sectional observational study. Data were taken from medical records of patients with pyogenic liver abscesses at Dr. Soetomo General Hospital, Surabaya, in 2017-2022. Data were taken on gender, age, type of bacteria/parasite, and type of definitive therapy. The sample size is taken from the entire sample (total sampling), where all subjects who meet the inclusion and exclusion criteria will be taken as samples. The inclusion criteria were patients diagnosed with liver abscesses by a surgeon or surgical resident doctor in 2017-2022, while the exclusion criteria were patient medical records with incomplete data.

**RESULT**

The total number of subjects in our study was 40 liver abscess patients. There were...
more male subjects, namely 33 subjects (82.5%). The youngest is 21 years old, and the oldest is 70 years old. By age group, there were 8 subjects (20%) in the 18–30 year age group and 8 patients (20%) in the 41–50 year age group (Figure 1). Meanwhile, in the 51–60 year age group, there were 10 (25%). The highest number was in the 31–40 year age group, with as many as 11 patients (27.5%), while the lowest age group was over 60 years, namely 3 patients (7.5%).

In bacterial cultures carried out on 40 patients with a diagnosis of liver abscess, it was found that in 6 cultures (15%), there was no bacterial growth, while in 34 cultures (85%), there was a growth of microorganisms. Of the 34 cultures with bacterial growth, there were 13 cultures (38.2%) with the growth of *Escherichia coli*, 2 cultures (5%) with the growth of *Streptococcus anginosus*, 4 cultures (10%) with the growth of *Enterobacter sp.*, 9 cultures (25.5%) with the growth of *Klebsiella pneumoniae*, 4 cultures (10%) with the growth of *Bacillus sp.*, 1 culture (2.5%) with the growth of *Candida albicans*, and 1 culture (2.5%) with the growth of *Pseudomonas sp.*

**DISCUSSION**

Hepatic abscess is the formation of a pus-filled cavity in the liver parenchyma due to bacterial, fungal, or parasitic infection. It is one of the most common tropical diseases of the gastrointestinal tract. Liver abscesses are classified as pyogenic liver abscess (PLA) or amoebic LA. This study found liver abscesses more common in patients aged 31-40 (27.5%). These results differ from previous research conducted by Sahu et al., which showed that the age group with the highest incidence of hepatic abscesses was the 18-30-year age group. Meanwhile, Mangukya et al. researched more than 400 patients with LA and showed the average age was 35.

This study showed that male subjects with hepatic abscesses showed a higher percentage (82.5%) than females (17.5%). The results of this study are supported by previous research conducted by Sahu et al. (2022), showing that the ratio of men and women is 5.67:1. In addition, this study showed that the majority of patients performed subcutaneous drainage management in 26 (65%) subjects, while 14 (35%) subjects performed surgical drainage. A previous study on 200 patients with hepatic abscesses conducted by Ghosh et al. showed that most patients were treated with percutaneous needle aspiration in 158 (79%) patients, followed by pigtail drainage in 34 (17%) subjects, and open surgery in 8 (4%) patients. Meanwhile, a study conducted by Sahu et al. on 64 patients showed that most patients with hepatic abscesses performed percutaneous needle aspiration in 45 patients, followed by percutaneous pigtail drainage in 10 patients, and open surgery in 9 patients.

Medical management is feasible in small abscesses, but 200 ml or more abscesses require therapeutic aspiration. Interventional radiology has changed the management of hepatic abscesses over the past three decades. Currently, antibiotics with percutaneous drainage (needle aspiration and pigtail drainage) are used as the management method of choice. Specific criteria for percutaneous drainage include abscess size >5 cm, persistent fever even after 48 to 72 hours of targeted antibiotic administration, and clinical features or images suggestive of perforation. Many recent studies use percutaneous drainage if the abscess size is >5 cm.

Bacterial cultures were performed on 40 patients diagnosed with hepatic abscess, and 6 cultures (15%) had no bacterial growth, while 34 cultures (85%) had...
microorganism growth. Of the 34 cultures with bacterial growth, the most bacterial growth was *Escherichia coli* (32.5%), and the least bacterial growth was *Candida albicans* (2.5%) and *Pseudomonas sp.* (2.5%). This result is in line with research conducted by Rismiller et al., which found that the most isolates were *E. coli* (30%), followed by anaerobic bacteria as much as 26%, *S. viridans* as much as 24%, *Enterococcus spp.* as much as 20%, and *Klebsiella spp.* as much as 15%. This differs from research conducted by Lee et al., which showed that bacterial culture was performed on 122 patients with a positive rate of 84.4%. Sterile cultures in 19 (15.6%) patients, and multiple organisms were found in 13.6% of positive cultures. *Klebsiella* was the most common aerobic bacteria found. In patients with diabetes mellitus, cultures were positive in 30 of 39 patients (76.9%), and the most common isolated organism was also *K. pneumoniae* (96.7%). 25 of 31 (80.7%) patients with biliary duct stones had *K. pneumoniae* (36%) as the most frequently found organism in culture, followed by *Escherichia coli* (28%) and *Bacteroides fragilis* (16%).

The study has several limitations. First, because this study was limited to a single hospital, its results are not comprehensive enough to describe the situation throughout Indonesia. Secondly, there are comparatively few subjects in this research. More comprehensive results may be obtained from nationwide studies or larger-scale research.

**CONCLUSION**

From the data of this study, hepatic abscess patients at Dr. Soetomo General Hospital, Surabaya, in 2017-2022 mainly occurred in patients aged 31-40 and female. In addition, this study also showed that most patients were treated with subcutaneous drainage compared to surgical drainage. Bacterial growth cultures were found in most patients, with *Escherichia coli* bacteria being the most prevalent.

**ETHICAL CLEARANCE**

Patient approval has been obtained in this study, and ethics approval was fulfilled from the Ethics Committee of Dr. Soetomo General Hospital No. 2662/106/4/XII/2023.

**CONFLICTS OF INTEREST**

No competing interests were declared.

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**AUTHOR CONTRIBUTION**

All of the authors equally contributed to the study.

**REFERENCES**


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