

CHARACTERISTICS OF HEPATIC ABSCESS PATIENTS UNDERGOING TREATMENT AT NTB PROVINCIAL HOSPITAL FOR THE PERIOD 2020-2023

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ABSTRACT

Background: *A liver abscess is defined as a mass containing pus that can arise due to injury to the liver or intra-abdominal infection that spreads from the portal circulation. The annual incidence rate is approximately 2.3 cases per 100,000 people. Men are affected more often than women. Age plays a role as a factor that determines the type of abscess that develops, where those aged 40-60 years are more susceptible to non-traumatic liver abscesses and most of them are reported to be pyogenic. In developing countries, amoebic liver abscess is more common than pyogenic liver abscess. The incidence of liver abscesses that occur in the NTB Provincial Regional Hospital is still unknown, but the presence of protozoa or bacteria that cause liver abscesses is often found in Indonesia. This study aims to determine the characteristics of liver abscess patients undergoing treatment at the NTB Provincial Regional Hospital for the 2020-2023 period.*

Method: *This research is a retrospective descriptive study with a cross-sectional design. The sampling technique in this study was simple random sampling, which was obtained from secondary data in the form of medical records of all liver abscess patients undergoing treatment at the NTB Provincial Regional Hospital for the period 2020 - 2023.*

Results and Conclusions: *From this study it was found that the characteristics of liver abscess patients undergoing treatment at the NTB Provincial Regional Hospital were mostly men, with the largest age group being 50 - 59 years old (27.5%), the highest number of diagnoses of liver abscess without complications were 132 patients (72.5%), with complications obtained by Peritonitis generalista ec ruptured liver abscess in 38 patients (20.9%). The main antibiotic used is Metronidazole, as well as additional antibiotics including Cefrtiaxone, Levofloxacin, Ceftazidine, Meropenem, Cefoperazone and Moxifloxacin. The most common procedures performed were laparotomy and liver abscess drainage (75.8%), several other procedures such as adhesiolysis (20.9%), liver resection (2.2%), liver repair (0.5%), cecum repair (0.5%), and long Treatment for liver abscess patients in this study was in the range of 6 – 10 days (54.9%) with an average of 7.7 days.*

Keywords: *Liver abscess, characteristics, NTB Provincial General Hospital*

INTRODUCTION

A hepatic abscess is defined as a pus-filled mass that can be caused by injury to the hepatic bed or intra-abdominal infection spreading from the portal circulation. The majority of these abscesses are categorized to be pyogenic or amoebic, although a small proportion are caused by parasites and fungi. Most amoebic infections are caused by *Entamoeba histolytica*. Pyogenic abscesses are usually polymicrobial, but some organisms are more commonly seen in such abscesses, such as *E.coli*, *Klebsiella*, *Streptococcus*, *Staphylococcus*, and anaerobes. Despite the low incidence, it is important to understand the severity of these abscesses due to the high risk of mortality in untreated patients.¹

The common pattern of abscess formation is perforation of the intestine draining into the hepatic via the portal vein, but there are also many cases of bile duct infection causing abscesses. The main cause of hepatic abscess used to be appendicitis, but the rate has decreased to less than 10% since better diagnosis and management of the disease. Currently, biliary tract diseases (gallstones, strictures, malignancies, and congenital abnormalities) are the leading causes of hepatic abscesses. In addition, it is necessary to look for other sources of infection such as endocarditis that has spread hematogenously to the liver. *Klebsiella pneumoniae* is a prominent etiology in Southeast Asia and is thought to be associated or related to colorectal cancer. If the source is anaerobic bacteria, the most common organism is *Entamoeba histolytica*. The disease affects the liver by first causing amoebic colitis, then spreading to the portal system and migrating to the liver and causing amoebic hepatic abscess.¹

The annual incidence rate is about 2.3 cases per 100,000 people. Males are more commonly affected than females. Age plays a role in determining the type of abscess that develops, with 40-60 year old more susceptible to non-traumatic liver abscesses and most reported to be pyogenic.¹ In developing countries amoebic liver abscess is more common than pyogenic liver abscess.² The mortality rate of pyogenic liver abscess is very high, reaching almost 40%. With the advent of antibiotics, the mortality rate has been reduced to less than 10%. The 30% mortality rate is usually characterized by complications such as abscess rupture. If the patient has comorbid factors that favor a worse prognosis, the mortality rate will triple.³

Pyogenic liver abscesses are also common in western Asia. In western Asia, 84% of patients were diagnosed with pyogenic *Klebsiella pneumoniae* liver abscess. Pyogenic liver abscess has a prevalence of 48% of all tissue abscesses. Pyogenic liver abscess occurs due to infection by aerobic or anaerobic bacteria leading to descending infection. The bacteria enter through the systemic circulation, such as the portal system, which eventually causes cell damage to the liver tissue. In addition to systemic circulation, pyogenic liver abscess can also be caused by obstruction of the bile ducts. This causes an increase in laboratory markers, such as bilirubin, SGOT and SGPT, and a decrease in Hb and albumin in patients with pyogenic liver abscess. Damage caused by bacteria is mostly multiple in the right lobe of the liver abscess.^{1,3}

Amoebic liver abscess is the most common extraintestinal manifestation of infection from the protozoan *Entamoeba*

histolytica. The parasite enters through the ascending route of the GI Tract or through the portal vein. Upon entry, the parasite secretes proteolytic enzymes which can increase leukocyte levels greatly. Because it enters through the portal vein, the affected lobe is more on the right lobe with a single characteristic with a larger size. The presence of *Entamoeba histolytica* protozoa is most prevalent in Asia, due to many developing countries with low economic status. In Indonesia, the presence of *Entamoeba histolytica* is 18%-25% with the most common extra-intestinal infection being the liver.³

The incidence of hepatic abscesses that occur in the NTB Provincial Hospital is still unknown, but the presence of protozoa or bacteria that cause hepatic abscesses is commonly found in Indonesia. This study aims to determine the characteristics of patients with hepatic abscess who underwent treatment at the NTB Provincial Hospital for the period 2020-2023.

METHODS

This study is a retrospective descriptive study with a cross-sectional design. The study used medical record data of patients with hepatic abscess who underwent treatment at the NTB Provincial Hospital in the period 2020 to 2023. The study was conducted at the NTB Provincial Hospital from November to December 2023. Inclusion criteria were all patients included in the sampling who were diagnosed with hepatic abscess from 2020 to 2023. Exclusion criteria are patients with incomplete medical record data. This study uses a simple random sampling technique, namely random sampling of the population without regard to the strata in the population and each member of the population has the same opportunity to be sampled. The data obtained were analyzed

using the SPSS Statistics 28 application and presented in descriptive form.

RESULTS

In the study period, 183 hepatic abscess patients were obtained. Sampling based on the descriptive research sampling formula obtained the required sample of 183 patients, so the sample in this study amounted to 183 samples.

Table 1. Characteristic Data

Characteristics	Frequency (n)	Percentage (%)
Age (year)		
0-9	1	0,5
10-19	4	2,1
20-29	11	6,0
30-39	28	15,3
40-49	33	18,0
50-59	50	27,3
60-69	43	23,4
70-79	11	6,0
80-89	2	1,0
Total	183	100,0
Gender		
Male	151	82,5
Female	32	17,4
Total	183	100,0
Level		
SD	1	0,5
SMP	4	2,1
SMA	11	6,0
S1	28	15,3
S2	33	18,0
Tidak Bersekolah	50	27,3
Total	43	23,4
Country		
Mataram	22	12,0
Lombok Barat	24	13,1
Lombok Tengah	26	14,2
Lombok Timur	22	12,0
KLU	19	10,3
Sumbawa	16	8,7
Dompu	14	7,6
Bima	40	21,8

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Total	183	100,0
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In Table 1, it was found that the characteristics of patients with hepatic abscess who underwent treatment at the NTB Provincial Hospital for the period 2020 - 2023 were mostly male 82.5%, the largest age group was 50-59 years old 50 patients (27.3%), with the age of the oldest

patient being 83 years old and the youngest patient being 8 years old, was 83 years old and the youngest patient was 8 years old, the most domiciled in Bima 40 patients (21.8%), and the most educational background was 32.7% of patients not attending school, 30.6% with the last high school education.

Table 2. diagnostic, location, antibiotic, and operation for patients hepar abscess

Characteristics	Frequenc y (n)	Percentage (%)
Diagnostic Hepar Abscess with or without complication		
Hepar abscess	133	72,6
Peritonitis generalisata ec rupture of hepatic abscess	38	20,7
Multiple giant livers with secondary infection	1	0,5
Perforated hepatic abscess	2	1,0
Ruptured hepatic abscess omental adhesiolysis	8	4,3
Hepatic abscess with hepatoma	1	0,5
Total	183	100,0
Lobus		
Kanan	161	87,9
Kiri	17	9,2
Kanan s/d kiri	5	2,7
Total	183	100,0
Antibiotik Utama		
Metronidazole	183	100,0
Antibiotik Tambahan		
Ceftriaxone	108	59,0
Levofloxacin	33	18,0
Meropenem	13	7,1
Ceftazidine	16	8,7
Moxifloxacin	3	1,6
Cefoperazone	10	5,4
Total	183	100,0
Operation		
Laparotomy Exploration and drainage hepar abscess	138	75,4
Laparotomy Exploration, drainage hepar abscess, and adhesiolisis	38	20,7
Laparotomy Exploration with resection hepar	4	2,1
Laparotomy Exploration, drainage, and repair hepar	1	0,5
Laparotomy Exploration, drainage, and repair caecum	1	0,5
Laparoscopy	1	0,5
Total	183	100,0
Length of post operation care (day)		
1-5	53	28,9
6-10	100	54,6
11-15	26	14,2
16-20	4	2,1
Total	183	100,0

Table 3. Diagnosis and Operation with Patient Hepar Abscess

Diagnosis	Operation					
	Laparotomy exploration and drainage hepar abscess	Laparotomy exploration, drainage hepar abscess, and adhesiolisis	Laparotomy exploration with resection hepar	Laparotomy exploration, drainage, and repair hepar	Laparotomy exploration, drainage, and repair caecum	Laparoscopy
Hepar abscess	122	9	1	0	0	1
Peritonitis generalised ec rupture abscess hepar	14	21	2	0	1	0
Multiple giant liver with secunder infection	0	0	1	0	0	0
Hepar abscess with perforation	2	0	0	0	0	0
Rupture abscess hepar with adhesiolisis omentum	0	8	0	0	0	0
Hepar abscess with Hepatoma	0	0	0	1	0	0
Total	138	38	4	1	1	1

In Table 2, the diagnosis of hepatic abscess without complications was 72.6% and hepatic abscess with the most complications, namely Peritonitis generalised ec rupture of hepatic abscess 20.7%. Then the location of the most abscesses in the right lobe 87.9%, with the most antibiotics used, namely Ceftriaxone as many as 108 patients (59.0%), the most common action performed was Laparotomy exploration and drainage of hepatic abscess 75.4%, then the longest post-action

treatment was in the range of 6 - 10 days (54.6%), where the longest post-operation was 19 days and the fastest was 4 days, with an average treatment of 7.7 days (SPSS).

In Table 3, it was found that the diagnosis of uncomplicated hepatic abscesses mostly received Laparotomy exploration and drainage of hepatic abscesses, namely 122 patients. Then for Peritonitis generalista ec rupture of hepatic abscess most of them get Laparotomy exploration, drainage of hepatic abscess

and adhesiolysis as many as 21 patients. Patients with multiple giant liver with secondary infection received Laparotomy exploration with hepatic resection, hepatic abscess with hepatoma received Laparotomy exploration, drainage and hepatic repair, and all patients with ruptured hepatic abscess adhesiolysis omentum received Laparotomy exploration, drainage of hepatic abscess and adhesiolysis.

DISCUSSION

Based on the data from this study, the majority of hepatic abscess patients were male (82.5%), this is in accordance with the literature which states that one of the risk factors for hepatic abscess is male gender, supported by the results of research conducted by Saumic et al in 2014 the ratio of men and women is 13.3: 1.4 Sahu's research in 2022 the ratio of men and women was 5.67: 1.7, in addition, the latest research conducted by Akhondi in 2023 also stated the same thing, namely men are more often affected than women.⁷ The majority of patients are young males who are likely to be alcoholics from lower socioeconomic classes which is also consistent with previous studies.⁵

The age predisposition and gender difference may be due to the high alcohol intake in young men which predisposes to amoebic hepatic abscess. Alcohol suppresses the function of Kupffer cells (specialized macrophages) in the liver that play an important role in clearing the amoeba. In addition, invasive amoebiasis appears to depend on the availability of free iron. High iron content in the diet, often obtained from the liquor of individuals who habitually consume alcohol, is a predisposing factor for invasive amoebiasis.⁴

The age of hepatic abscess patients in this study was mostly at the age of 50 -

59 years (27.3%), 60-69 years (23.4%), in line with research conducted by Heneghan et al, the average age that appeared was 65 and 60.3 years, respectively.⁵ Sahu in 2022 stated that the average age of presentation of hepatic abscess was 40.72 years.⁷ In a study conducted by Akhondi in 2023, it was stated that patients aged 40-60 years were more prone to developing non-traumatic hepatic abscesses.¹

In this study, hepatic abscess was also found at a young age, where this was also found in another study conducted by Hoffman (2019), it was found that hepatic abscesses also occurred in patients with adolescent age.⁹ In addition, a retrospective study based on medical record review, in pediatric patients (aged <18 years with pyogenic hepatic abscess and hospitalized at Chang Gung Memorial Hospital in January 2000 and December 2019, found that the average age of patients was 9.6 ± 6.2 years (range 1 month to 18 years 6 months), there were 25 male (66%) and 13 female (34%) patients (Male to female ratio: 1.92:1). The study reported 38 pediatric patients with hepatic abscess in a 20-year period. The estimated incidence was 5.39 per 100,000 pediatric patients admitted during 2011-2018, which was said to reflect a possible association with sanitation, healthcare access, and nutritional conditions.¹⁰

Underlying diseases and host predisposing factors thought to be associated with the development of hepatic abscesses in children include immunocompromised status (malignancy, malnutrition, and chemotherapy or immunosuppressant use), chronic granulomatous disease, celiac disease, diabetes mellitus, biliary tract abnormalities, abdominal disease. trauma, certain parasitic infections, systemic sepsis, perforated appendicitis, umbilical

infection, and inappropriate umbilical vein catheterization.¹⁰

In this study, the diagnosis of uncomplicated hepatic abscess was the most common, namely 133 patients (72.6%), with complications obtained Peritonitis generalista ec rupture of hepatic abscess 38 patients, there were also several other complications such as multiple giant liver with secondary infection, perforated hepatic abscess, rupture of hepatic abscess adhesiolysis omentum and hepatic abscess with hepatoma.

If left untreated, the hepatic abscess may rupture, causing peritonitis and shock. This will cause chronic pain and discomfort in the right upper quadrant of the abdomen with nighttime fever may occur.¹ Secondary peritonitis is a state of pathological conditions from the intra-abdominal such as aseptic or septic pre-existing, the most likely cause is the rupture of the hepatic abscess, rupture of the abscess that causes the spread to the peritoneum, this is because the liver receives blood circulation from the systemic and portal, the hepatic is more susceptible to infection and abscess from the bloodstream.¹ Rupture of the hepatic abscess is considered an emergency, so in particular, ruptures resulting in peritonitis require immediate surgical intervention.¹¹

The diagnosis of hepatic abscess in this study has the most location, namely in the right lobe 87.9%, this is similar to Kozielwicz's study in 2021 where the most common location of hepatic abscess is the right lobe compared to the second or left (60-70% vs 25% and 15% of cases respectively).⁸ Liver abscess can be classified in various ways: One is based on the location in the hepatic bed. 50% of solitary hepatic abscesses occur in the right lobe where it is the more significant part

with more blood supply, less often in the left liver lobe or caudate lobe.¹

In Sahu's study in 2022 the right lobe was more affected (83%) than the left lobe. The mean age of liver abscess presentation was 40.72 years, with a male to female ratio of 5.67:1. Alcohol consumption was reported by 33% of patients, mostly males. Serum bilirubin was elevated in 56% of liver abscess patients, while it was normal in 44%. The mean serum bilirubin was 2.08 mg/dl. The mean values in group 1, group 2, and group 3 were 1.44 mg/dl, 2.23 mg/dl, and 2.57 mg/dl, respectively. Liver abscesses were identified in 76% of patients with right lobes; 83% had solitary liver abscesses and 17% had multiple abscesses. Abscess culture showed *E. coli* in 21 (32.81%) patients and *Klebsiella* in 17 (26.56%) patients.

In the study of Soumik et al the 6th and 7th segments in the right lobe were most commonly affected. The predilection of hepatic abscesses in the right lobe is due to the effect on the portal circulation which receives

Predilection of hepatic abscesses in the right lobe is due to the effect on the portal circulation which receives most of the blood flowing from the right colon, the main site of intestinal amoebiasis.⁴

Antibiotics should include Enterobacteriaceae, anaerobes, streptococci, enterococci, and *Entamoeba histolytica*. Such antibiotic regimens include cephalosporins plus metronidazole, Beta-lactam Beta-Lactamase inhibitors plus metronidazole, or synthetic penicillins plus aminoglycosides and metronidazole.¹

Alternatively, fluoroquinolones or carbapenems can replace cephalosporins or penicillins in case of allergy or

unavailability. The duration of treatment varies but is usually two to six weeks. After initial intravenous treatment, the oral route can be used safely in most cases to complete treatment. Culture results help narrow down the organisms so that empirical treatment is no longer required as it can lead to antibiotic resistance. Anaerobes are difficult to culture, so should be treated empirically throughout. For stable patients, antibiotics can be given post drainage to improve culture results for appropriate treatment.¹

In this study, the main antibiotic used was Metronidazole in all patients, then additional antibiotics included Ceftriaxone (cephalosporin group) as much as 58.8%, then Levofloxacin (fluoroquinolone group) 18.1%, Ceftazidime (cephalosporin group) 8.8%, Meropenem (β lactam group) 7.1%, Cefoperazone (cephalosporin group) 5.5%, and Moxifloxacin (quinolone group) 1.6%. Then added several other drugs to treat symptoms in patients, including analgesic, antiemetic and anti-fibrinolytic drugs.

Other possible indications for surgical intervention are anatomical locations that are not inaccessible anatomical location, failure of response to treatment after conservative therapy, and other associated complications such as peritonitis, biliary-enteric fistulization, and so on.¹ Surgical intervention is required in large, multi-site abscesses and ruptures, resulting in peritonitis.¹¹

The most common procedure was Laparotomy and drainage of hepatic abscess (75.8%), followed by adhesiolysis (20.9%), and other procedures such as exploratory Laparotomy with hepatic resection (2.2%), hepatic repair (0.5%), caecum repair (0.5%) and laparoscopy (0.5%).

Drainage of the abscess and antibiotic treatment are the main treatments of a hepatic abscess. Drainage is required and can be performed under ultrasound or CT-Scan. Needle aspiration is sometimes performed for abscesses less than 5 cm in size. Percutaneous drainage with catheter insertion may be the most successful procedure for abscesses larger than 5 cm. Laparoscopic drainage is also sometimes used, and surgery should be performed for peritonitis, abscesses with thick walls, abscess rupture, multiple large abscesses, and previously failed drainage procedures.¹

The procedure is performed with either a transperitoneal approach or a posterior transpleural approach. The former approach drains the abscess and allows for exploration of undetected ulcers. The size, location and stage help determine the success of the treatment plan. An undrained hepatic abscess can lead to sepsis, peritonitis and empyema.¹

The length of treatment of hepatic abscess patients in this study was in the range of 6 - 10 days (54.9%), where the longest treatment was 19 days and the fastest was 4 days, with an average treatment of 7.7 days. This is in line with a study conducted by Abbas, amoebic hepatic abscess patients had an average hospital stay of about 7.7 days where all patients recovered, then the average length of hospitalization for pyogenic hepatic abscess patients was 13.6 days.⁸ In a study conducted by Abbas, patients with amoebic hepatic abscess had an average hospital stay of about 7.7 days where all patients recovered. In a study conducted by Akhondi in 2023, the average length of stay in the hospital, namely the start of hospitalization was 7.2 days, ranging from 3 to 11 days.¹

CONCLUSION

Based on the results of data analysis and discussion in this study, it can be concluded that the characteristics of patients with hepatic abscess who underwent treatment at the NTB Provincial Hospital for the period 2020 - 2023 were mostly male, with the largest age group at the age of 50 - 59 years (27.3%), the diagnosis of uncomplicated hepatic abscess was the most, namely 133 patients (72.6%), with complications obtained Peritonitis generalista ec rupture of hepatic abscess 38 patients. In this study, the main antibiotic used was Metronidazole in all patients, then additional antibiotics including Ceftriaxone, Levofloxacin, Ceftazidime, Meropenem, Cefoperazone and Moxifloxacin as well as several other drugs to treat symptoms in patients. other drugs to manage symptoms in patients, including analgesic, antiemetic and antifibrinolytic drugs.

The most common procedure was Laparotomy and drainage of hepatic abscess (75.4%), then additional adhesiolysis (20.7%), and other procedures such as exploratory Laparotomy with hepatic resection (2.1%), hepatic repair (0.5%), caecum repair (0.5%), laparoscopy (0.5%), with the length of treatment of hepatic abscess patients in this study in the range of 6 - 10 days (54.9%) with an average of 7.7 days.

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