

Analysis of Clinical, Etiological, and Biochemical Profile of Patients with Liver Abscess: A Prospective Study

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Abstract

Background: Of all the visceral abscesses, 48% are liver abscesses. Every year, between 40 and 50 million people worldwide suffer from abscesses. It is prevalent and has the second-highest incidence in India as a result of inadequate nutrition, overcrowding, and poor sanitation. This study aims to assess the etiology, clinical characteristics, and biochemical abnormalities of patients with liver abscesses.

Methods: From September 2020 to February 2021, 104 patients with liver abscesses identified by ultrasonography were examined in the Medicine department of Darbhanga Medical College and Hospital in Laheriasarai, Bihar. Every patient undergoes biochemical testing and a thorough clinical evaluation. Three groups were established based on the microbiological study: the pyogenic liver abscess (PLA) group (n = 28), the amoebic liver abscess (ALA) group (n = 39), and the not aspirated group (n = 37).

Results: Most of the patients belong to ALA group (58.2%) with male preponderance (90.1% in ALA and 60.7% in PLA group) ($P = 0.0038$). Maximum number of patients of ALA were in <40 years of age group (92.3%) compared to PLA (17.8%) ($P = 0.003$). Most common comorbidity was cholelithiasis (23.52% in ALA and 37.71% in PLA), and common symptoms were fever (92.30% in ALA and 68.96% in PLA), hypotension (39.2% in PLA and 20.5% in ALA), icterus (42% in ALA and 46% in PLA), and right quadrant tenderness (65.6%). Raised alkaline phosphatases (66% in ALA and 75% in PLA) were the most common liver function test abnormality.

Conclusion: PLA was more common in individuals over 40 with concomitant conditions such diabetes, cholelithiasis, or cholangitis and pulmonary findings, while ALA is more common in young males under 40 with a history of diarrhea and soreness or pain in the abdomen. Unlike PLA, ALA can be controlled without ambulation.

Keywords: Bacterial Growth; Percutaneous Aspiration; Cholelithiasis; Alkaline Phosphatases.

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Introduction

The accumulation of purulent material in the liver parenchyma as a result of bacterial, parasite, fungal, or combination infections is known as a liver abscess. Liver abscesses are very common in the Indian population, perhaps as a result of inadequate nutrition, overcrowding, and poor sanitation.[1] Every year, liver abscesses afflict 40–50 million people worldwide.[2]

Prevalence rates as high as 55% have been reported in a number of studies conducted in rural regions of Central and South America, India, and tropical Asia and Africa.[3,4]

The incidence of pyogenic liver abscess (PLA) is approximately 1.1–2.3 per 100,000 person-years

worldwide, and it has been increasing in the US, where it is roughly 3.6 per 100,000.[5] The two main categories of liver abscess are PLA and amoebic liver abscess (ALA). The majority of pyogenic and amoebic etiologies are found in industrialized and developing nations, respectively. Although the two abscesses have many clinical, laboratory, and imaging characteristics in common, their epidemiology and approaches to therapy differ greatly. Therefore, for treatment to be effective, distinction is necessary.[6]

In order to assess the etiology, clinical characteristics, and biochemical abnormality of

patients with liver abscess, the current investigation was carried out.

Materials and Methods

104 patients with liver abscesses were included in a prospective study conducted from September 2020 to February 2021 at the Department of Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Bihar.

All 104 patients of liver abscess included in the present study were diagnosed on the basis of ultrasonography. All patients were subjected to detailed clinical examination, biochemical testing, radiological assessment, optimal management, and outcome.

Of 104 patients, 67 gave consent for aspiration, and hence, the microbiological diagnosis was

confirmed in these patients. On the basis of the microbiological study, three groups were formed: ALA group ($n = 39$), PLA ($n = 28$) group, and not aspirated group ($n = 37$). Data were analyzed using the software IBM SPSS versus 20. Frequency distribution and cross tabulation were used to prepare Tables 1 and 2. Quantitative data were analyzed using Student's t-test, and categorical data were analyzed using Pearson's Chi-square test. Two-tailed $P < 0.05$ was considered as statistically significant.

Results

28 (41.8%) and 39 (58.2%) of the patients in this investigation were PLA and ALA, respectively. In both groups, males outnumbered females (90.1% in the ALA group and 60.7% in the PLA group) ($P = 0.0038$).

Table 1: Comparing different parameters between both the groups

Parameter	ALA (n=39)		PLA (n=28)		Total (n=67)	P value
	Male(n=34)	Female (n=5)	Male (n=17)	Female (n=11)		
Age group (years)						
<20	2 (6.8)	0 (0)	0 (0)	0 (0)	2 9 (0.1)	0.003
21–40	29 (85.2)	5 (100)	2 (11.7)	3 27.27)	37 (55.2)	
41–60	3 (7.7)	0 (0)	11(64.7)	8 (72.7)	22 (32.8)	
>61	0 (0)	0 (0)	4 (23.5)	0 (0)	4 (6.1)	
Education status						
Illiterate	23 (67.6)	4 (80)	4 (23.5)	7 63.63)	38 (56.7)	NS
HS	9 (26.4)	1 (20)	10 (58.8)	4 (36.36)	24 (27.5)	
G	2 (5.8)	0 (0)	2 (11.7)	0 (0)	4 (5.97)	
PG	0 (0)	0 (0)	1 (5.88)	0 (0)	1 (1.44)	
Occupation						
GS	2 (44.4)	0 (0)	5 (29.4)	0 (0)	7 (10.44)	0.0038
Laborer	19 (55.8)	0 (0)	8 (47.5)	0 (0)	27 (40.2)	
Farmer	11(32.3)	0 (0)	3 (17.6)	0 (0)	14 (20.2)	
Other	4 (11.7)	5 (100)	1 (58.82)	11(100)	21 (31.34)	

ALA: Amoebic liver abscess, PLA: Pyogenic liver abscess, M: Male, F: Female, HS: Higher secondary, GS: Government servant, NS: Not significant

Alcohol ingestion in male patient was attributed to an increased risk of liver abscess, i.e., ALA (74.3%) and PLA (58.8%) ($P = 0.0038$). On comparing clinical parameters between the groups, it was found that hypotension was most common with PLA (39.2%) compared to ALA patient (20.5%). Icterus was present in 43% of the total liver abscess patient, i.e., ALA (42%) and PLA (46%) ($P > 0.05$). Most common per abdomen finding in liver abscess patient was right quadrant

tenderness (65.6%), followed by hepatomegaly (40%) and splenomegaly (19%). Most common liver function test abnormality was raised serum alkaline phosphatase (70%), 66% patient of ALA and 75% patient of PLA. No significant difference was obtained between ALA and PLA patients in the level of serum bilirubin, serum glutamic oxaloacetic transaminase (SGOT), serum glutamate pyruvate transaminase (SGPT), prothrombin time (PT), and serum albumin ($P > 0.05$).

Table 2: Comparing comorbidity and associated symptoms in both the groups

Parameter	ALA (n=39)		PLA (n=28)		Total (n=67)	P value
	Male(n=34)	Female (n=5)	Male (n=17)	Female (n=11)		
Comorbidity						
Cholelithiasis	8 (23.52)	0 (0)	5 (29.41)	5 (45.45)	19 (28.53)	0.038
Cholangitis	1 (2.94)	0 (0)	4 (23.5)	3 (27.27)	8 (14.2)	
CLD	4 (11.76)	0 (0)	3 (17.64)	0 (0)	7 (11.8)	
Diabetes mellitus	8 (23.5)	0 (0)	9 (52.54)	5 (45.45)	22 (32.8)	
HIV	4 (11.7)	0 (0)	1 (5.88)	0 (0)	5 (7.74)	
On ISD	6 (17.64)	0 (0)	1 (5.88)	0 (0)	7 (10.44)	
Symptoms						
Fever	31 (91.17)	5 (100)	13 (76.4)	7 (63.63)	56 (83.4)	0.031
Abdominal pain	30 (88.23)	5 (100)	12 (70)	8 (72.72)	55 (82)	
Malaise	26 (76.47)	4 (80)	15 (88.23)	7 (63.63)	52 (77.7)	
Weight loss	19 (55.88)	3 (60)	5 (29.41)	4 (36.66)	31 (46.26)	
Nausea/vomiting	23 (67.64)	3 (60)	9 (52.94)	8 (72.72)	43 (64.17)	
Diarrhea	11(32.35)	2 (40)	1 (5.88)	0 (0)	14 (20.89)	
Cough	6 (17.64)	1 (20)	4 (23.52)	2 (18.18)	13 (19.4)	

Discussion

Tropical countries have a higher prevalence of liver abscesses.[1,7] Various bacteria (pyogenic) and *Entamoeba histolytica* (amoebic) are the major etiological agents for liver abscess. Amoebic etiology accounts for the majority of liver abscess cases in developing countries.[7]

Most of the patients in the present study with liver abscess were in middle age with patients in second–fourth decade accounting for 55.2% of the cases which is comparable to a study done by Giorgio *et al.*[8] Siddiqui *et al.* reported that, in case of ALA, most common age group was 31–40 years, and in case of PLA, it was 41–50 years.[6] In our study, there was a high incidence of liver abscess in males (77.61%) as was seen in another study by Huang *et al.* (96%).[9] A similar study done by Choudhary and Choudhary also reported similar age group (30–60 years) in liver abscess patients with male preponderance (72%).[10] Siddiqui *et al.* studied 50 liver abscesses cases and reported male preponderance (88%).[6] In the present study, fever (83.4%) was the most common symptoms followed by pain in the abdomen (82%). Similarly, Choudhary and Choudhary reported pain in the abdomen (98%) and fever (94%) as the most common symptoms.[10] Similar to the present study, Siddiqui *et al.* also showed that, among 50 patients, 92% of patients presented to the hospital with fever and 76% of patients presented with upper abdominal pain.[6] Ghosh *et al.* reported in 99% and 94%, whereas various other studies quote it in the range of 62–94% and 67–87%, respectively.[11-13] Most common abdominal finding in liver abscess patient in the present study was right quadrant tenderness (65.6%), followed by hepatomegaly (40%) and splenomegaly (19%). Choudhary and Choudhary also reported abdominal tenderness (98%) followed by hepatomegaly

(50%), jaundice (23%), and right intercostal tenderness (61%) as the most common clinical signs.[10] Almost similar to the present study, Seeto and Rockey reported that 60% of patients had either right upper quadrant tenderness or hepatomegaly.[14] Jain *et al.* reported hepatomegaly in 80% of cases.[15] Ghosh *et al.* reported it in 89% of cases which correlates with the present study, whereas Das *et al.* found it in only 40% of cases which is contrary to the present study.[13,16] In our study, alcohol ingestion was the single most consistent etiological factor in 74.3% of ALA and in 58.8% of PLA male patients which is comparable to the study done by Mathur *et al.*[17] (91.30% of male cases consumed alcohol). All these patients had a history of alcohol consumption for more than 1 year. Thus, this study found a strong association of alcohol and liver abscess. Siddiqui *et al.* also reported that 44% had a history of intake of indigenous alcohol.[6] Jain *et al.* also reported alcohol consumption as a major risk factor in 58.4% of patients of ALA; however, only 14.2% of PLA cases were found alcoholic.[15] Contrary to the present study, Islam *et al.* showed that indigenous alcohol has association with the development of PLA.[18] Ghosh *et al.* had 72% of alcoholic patients in their study.[13] Most common liver function test abnormality was raised serum alkaline phosphatase (70%) (66% in ALA group and 75% in PLA group). No significant difference was obtained between ALA and PLA patients in the level of serum bilirubin, SGOT, SGPT, PT, and serum albumin ($P > 0.05$). Siddiqui *et al.* reported that liver function tests were within normal limits in most of the cases. Only 8% of PLA and 20% of ALA cases showed mild rise of alkaline phosphates.[6] Serum alkaline phosphatase was elevated in 96% of patients as reported by Jain *et al.* (Jain V 2017) with 95% and 100% frequency

from ALA and PLA, respectively, which is in accordance with various previous studies.[19-21] Jain *et al.* also reported that SGOT and SGPT were raised in 64% and 66% of patients, respectively, but in the present study, opposite results were found.[15]

Conclusion

According to the present study, patients over 40 who had lung findings and concomitant conditions such diabetes, cholelithiasis, or cholangitis were more likely to have PLA. ALA affects young men under 40 who have a history of diarrhea and discomfort or pain in their abdomen. ALA was most frequently found and, in the majority of cases, is manageable without aspiration. It is quite challenging to distinguish between pyogenic and amoebic abscesses. Our study's findings, which include the clinico-etiological profile of liver abscess, are consistent with those of other studies and literature, indicating that a presumptive diagnosis based on clinical features is reliable and that it is not necessary to perform diagnostic aspirations on all patients who present with hepatic abscess.

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