

**Correlation of Clinical and Biochemical Parameters in Liver Abscess Patients at Tertiary Centre of North Bihar**Chiranjeevi B<sup>1</sup>, Arohi Kumar<sup>2</sup><sup>1</sup>Senior Resident, Department of Medicine, Sri Krishna Medical College and Hospital (SKMCH), Muzaffarpur, Bihar<sup>2</sup>Professor, Department of Medicine, Sri Krishna Medical College and Hospital (SKMCH), Muzaffarpur, Bihar

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**Abstract:**

**Background:** 48 percent of all visceral abscesses are located in the liver. Due to inadequate nutrition, overcrowding, and poor sanitation, it is frequent in India, where it has the second highest prevalence. An estimated 40–50 million individuals worldwide contract amoebic abscesses each year. In order to provide a timely diagnosis and effective treatment, the purpose of this study is to monitor the clinical and biochemical characteristics of patients suffering from liver abscesses at the tertiary center set up in North Bihar.

**Methods:** The study examined 50 liver abscess patients and was carried out over a 12-month period. A physical examination and history were taken. A full hemogram, a liver function test, a coagulation profile (PT/INR), and an abdominal USG were performed on each patient. HIV and Entamoeba histolytica serology were performed.

**Results:** The patients were 41.8 years old on average, with a male preponderance. The majority of liver abscesses were amoebic (86%) as opposed to pyogenic (14%). Diabetes mellitus (20%) and alcoholism (52%) are the two main risk factors for hepatic abscess. In 80% of instances, hepatomegaly was detected. Low albumin, elevated PT INR, and elevated ALP all suggest a liver abscess. Right lobe abscesses accounted for 76% of all abscesses, and 66% of them were solitary. Pleural effusion (6%), and ascites (12%) were the observed complications.

**Conclusion:** Patients who come with a protracted fever and right upper quadrant abdominal pain may have a liver abscess, especially if they have diabetes mellitus or are alcoholism. The use of ultrasonography is a simple and affordable method of diagnosing liver abscess. A strong foundation for preventing complications, morbidity, and death is early and aggressive treatment.

**Keywords:** ALA, Liver abscess, PLA.

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**Introduction**

The liver contains 48 percent of all visceral abscesses. [1] A liver abscess is a build-up of purulent material in the liver parenchyma caused by bacterial, parasitic, fungal, or a combination of illnesses. It is most common in India, where it is the second most common cause, due to inadequate nutrition, overcrowding, and poor sanitation. [2]

Amoebic liver abscesses are thought to affect 40–50 million people annually worldwide. In endemic locations, the prevalence of infection is greater than 5%–10%. [3] Prevalence rates as high as 55% have been observed in a number of studies conducted in rural areas of Central and South America, India, and the tropical regions of Asia and Africa. [4,5] The incidence of pyogenic liver abscess is estimated to be between 1.1 and 2.3 per 100,000 person-years worldwide, and it has been increasing in the United States, where it is currently at 3.6 per

100,000. [6] Broadly classified into two types: pyogenic liver abscess (PLA) and amoebic liver abscess (ALA), with the majority of pyogenic etiologies occurring in industrialized countries and amoebic etiologies in poorer ones. [7] While amoebic and pyogenic abscesses have similar clinical, laboratory, and imaging features, their epidemiologies and courses of therapy differ significantly.

Therefore, distinction is necessary for treatment to be effective. [8] This paper examines the clinical, laboratory, and management aspects of patients suspected of having a liver abscess in order to facilitate early diagnosis, timely initiation of treatment, and avoidance of sequelae. The main aims of this study were to distinguish between amoebic and pyogenic liver abscesses, as well as to examine risk factors, clinical symptoms,

biochemical changes complications, and prognosis in liver abscess patients.

### Material and Methods

This study, which was conducted between October 2022 and September 2023 at Sri Krishna Medical College and Hospital in Muzaffarpur, Bihar, examined patients who attended the emergency room and outpatient department (OPD) for medicine.

The study included patients who met the inclusion criteria and provided written informed permission. Every willing adult over the age of eighteen who consistently had liver abscess symptoms and who had a radiological diagnosis of liver abscess (CT scan and ultrasound, if necessary). Participants in this study who did not provide informed consent were not included.

Over a period of a year, 50 patients with liver abscesses who came to the SKMCH medical OPD/Casualty were included in the study. Detailed medical history and physical examinations were performed. A full hemogram, a liver function test, a

kidney function test, a coagulation profile (PT/INR), and an abdominal USG were performed on each patient. The hospital laboratory's reference ranges served as the guidelines for these investigations' reference ranges. Cultures of the urine and blood were sent. Additionally, serologies for the hepatitis B, hepatitis C, HIV, and Entamoeba histolytica viruses were performed. As soon as the pus was aspirated, pus cultures were performed. Only after the abscess had subsided was the pus aspirated, and by then the patients had begun receiving antibiotics empirically.

### Results

The study included 50 patients in total, of which 41 (82%) were male and 9 (18%) were female. The ratio of men to women was 4.5:1. The age range of 40 to 50 years old saw the highest number of instances. The patients' ages ranged from 18 to 68 years old, with a mean of 41.8 years (Table 1). Based on amoebic serology and pus culture, an etiological investigation of liver abscesses showed that 86% of the cases were of the amoebic type (n = 43) and 14% were pyogenic (n = 7).

**Table 1: Demographic profile of liver abscess patients**

	ALA (43)	PLA (7)	Total (50)
Mean age (years)	42.06	39.2	41.8
Age range (years)	18-60	23-68	18-68
Sex : Male	36 (83.7%)	5 (71.4%)	41 (82%)
Female	7 (16.3%)	2 (28.5%)	9 (18%)

Drinking alcohol including Tadi was the most prevalent risk factor in our study, accounting for 26 (52%) of the cases. Another significant risk factor, diabetes mellitus (DM), was discovered to be 10% in the current investigation. Both risk factors were present in 12% of cases (Table 2).

**Table 2: Risk factor profile of liver abscess patients**

Risk Factors	ALA (43)	PLA (7)	Total (50)
Alcoholic	25 (58.14%)	1 (14.2%)	26 (52%)
DM	9 (21.0%)	1 (14.2%)	10 (20%)
ALC+DM	5 (11.6%)	0	6 (12%)

The most typical symptom was right upper quadrant abdominal pain (96%) which was followed by fever (94%). On abdominal examination, hepatomegaly (80%) was the most common result, followed by abdominal pain (72%). 50% of cases had anorexia. As a result, 6% of patients experienced ascitis and 12% of cases experienced right-sided pleural effusion (Table 3).

**Table 3: Clinical features of liver abscess patients**

Signs and Symptoms	ALA	PLA	Total
Fever	40 (93.0%)	7 (100%)	47 (94%)
Pain abdomen	41 (95.3%)	7 (100%)	48 (96%)
Vomiting	8 (18.6%)	2 (28.5%)	10 (20%)
Nausea	22 (51.1%)	2 (28.5%)	24 (48%)
Jaundice	9 (20.9%)	0	9 (18%)
Cough	9 (20.9%)	2 (28.5%)	11 (22%)
Abdominal tenderness	31 (72%)	5 (71.4%)	36 (72%)
Hepatomegaly	35 (81.4%)	5 (71.4%)	40 (80%)
Anorexia	23 (53.4%)	2 (28.5%)	25 (50%)
Pleural effusion	5 (11.6%)	1 (14.2%)	6 (12%)
Ascitis	2 (4.6%)	1 (14.2%)	3 (6%)

According to ultrasound examination, 76% of cases involved the right lobe, 14% involved a left lobe abscess, and 10% involved multiple abscesses (both lobes) (Table 4). Based on the examination of biochemical markers,

40 patients (or 80%) had a TLC count greater than 11000/mm<sup>3</sup>. Of the patients, 48 (96%) had elevated ALP. 37 patients (74%) had a rise in INR (Table 5).

**Table 4: USG findings of liver abscess patients**

	ALA	PLA	Total
Single	28 (65.11%)	5 (71.4%)	33 (66%)
More than One	15 (34.88%)	2 (28.5%)	17 (34%)
Lobe involved : Right	32 (74.41%)	6 (85.7%)	38 (76%)
Left	6 (14%)	1 (14.2%)	7 (14%)
Both	5 (11.6%)	0	5 (10%)

In the current investigation, we didn't aspirate the pus until the abscess had softened. Since the patients were started on empirical antibiotics before pus aspiration, pus cultures were negative in 49 out of 50 cases. There was no mortality in the current series.

**Table 5: Biochemical parameters of liver abscess patients**

	ALA	PLA	Total
TLC >11000/□L	35 (81.3%)	5 (71.4%)	40 (80%)
S. Bil. >1.2mg/dl	15 (34.8%)	1 (14.2%)	16 (32%)
SGOT >35	28 (65.2%)	5 (71.5%)	33 (66%)
SGPT >35	30 (69.8%)	4 (57.2%)	34 (68%)
SAP (IU/L)>100	41 (95.3%)	7 (100%)	48 (96%)
S. albumin <3.5	38 (88.3%)	6 (85.7%)	44 (88%)
INR >1	31 (73%)	6 (85.7%)	37 (74%)

## Discussion

Tropical nations tend to have higher rates of liver abscesses. [2,7] Both bacteria (pyogenic) and *E. histolytica* (amoebic) are frequent etiological factors for liver abscesses. Amoebic etiology accounts for the majority of liver abscess cases in underdeveloped nations. [7] More over three-fourths of the cases in the current study were also caused by ALA, with the majority of them being single right lobe abscesses. Sharma et al, Mukhopadhyay et al, and Ghosh et al. have all previously reported on this pattern of involvement in ALA series. [9–11]

According to Indian studies by Ghosh et al, Sharma et al, and Mukhopadhyay et al, the mean age of the patients in our study was 41.8 years, which was consistent with their reported values of 41, 40.5, and 43.64 years, respectively. [9–11] While PLA was prevalent in all age groups equally, the highest incidence of liver abscess was observed in the fifth decade of life, with comparable findings in cases of ALA. Studies from the west, where PLA are more prevalent, show that the average age is higher than 60. [12–14]

In terms of sex predilection, only 9 patients were found to be female after 50 successive recruitments. The male to female ratios recorded by Sharma et al, Mukhopadhyay et al, and Ghosh et al were 14.4:1, 7:1, and 11:1, respectively, indicating a preponderance of male engagement in the Indian data. [9–11] It was reported to be 2:1 by Pang et al. and 1.22:1 by Heneghan et al. [12, 13]

While only 14.2% of PLA cases were discovered to be alcoholics, alcohol intake was considered a

substantial risk factor in the current investigation, as it was shown to be present in 58.4% of ALA patients. This runs counter to a study by Islam QT et al. that found a link between native alcohol use and the emergence of pyogenic liver abscesses. [15] In their study, Ghosh et al. included 72% of alcoholic patients. [11] Alcohol inhibits the liver's Kupffer cells, which are specialized macrophages that play a crucial part in amoeba clearance. Furthermore, the presence of free iron seems to be a prerequisite for invasive amoebiasis. Both a high iron and high-carb diet which is typically acquired from country liquor in heavy drinkers predispose people to invasive amoebiasis. [16]

Another risk factor that was observed in 20% of instances was diabetes mellitus, and 12% of patients also had alcoholism. Diabetes was documented in 9% of patients by Ghosh et al. and 70% by Das et al. According to Thomsen et al., compared to control persons, diabetic patients had a 3.6-fold higher risk of getting PLA. [17]

According to the current study, abdominal discomfort and fever account for 96% and 94% of all symptoms, respectively. According to Ghosh et al., it is present in 99% and 94% of cases, but other research reports it to be between 67-87% and 62-94% of cases, respectively. [9–11]

Other notable symptoms that were more common in ALA patients included nausea and anorexia, which were reported in 48% and 50% of cases, respectively. In their study, Ghosh et al. found that 93% of the patients had anorexia and 54% had nausea and vomiting. [11] Cough was another unusual symptom that affected 22% of the individuals.

Only 18% of cases had jaundice, which is consistent with the trend. Ghosh et al. observed it in 26 percent of patients. [11] It was noted in 45–50% of patients in earlier Indian research. [18] But it's grown less common since effective antimicrobial therapy was developed. It was only documented in 12.7% of patients by Sharma et al. [9] In their analysis of patient data from the 1970s and 1980s, Yoo et al. found that the incidence of jaundice decreased from 25% to 7% throughout this time. [19] In the current investigation, diarrhea was observed in 24% of the patients, a finding that was previously reported by Ghosh et al in 23% of the patients and varied from 4% to 33% in prior studies. [9–11, 20–22] In 80% of the cases, we reported hepatomegaly. Das et al. discovered it in only 40% of cases, which is in contrast to the current study, whereas Ghosh et al. reported it in 89% of cases, which agrees with the current study. [11,23]

In the current study, leukocytosis was found in 80% of the patients, with 81.3% and 71.4% frequency in ALA and PLA, respectively. Leucocytosis cannot therefore be used to distinguish between ALA and PLA and is not a reliable sign of PLA. Similar results were found by Ghosh et al. in 82% of cases with leucocytosis. [11] Malik and colleagues found that in 68% of PLA cases, leucocytosis was present. [24] In Khan et al., polymorphonuclear leucocytosis was found in 26.7%. [25] According to other earlier research, blood alkaline phosphatase was raised in 96% of patients in the current study, with 95% and 100% frequency from ALA and PLA, respectively. [24,26,27]

In 64% and 66% of the patients, respectively, SGOT and SGPT were elevated. In 88% of the patients, the albumin level was less than 3.5g/dL. Ghosh et al. also observed similar findings. In 85.7% of PLA cases and 74% of all liver abscess cases, 11 PT INR >1. Regarding radiological findings, 66% of patients had a single abscess and 34% had numerous abscesses.

Likewise, a research by Ghosh et al. discovered 65% of single abscesses. [11] In line with prior investigations, the right lobe was mostly implicated. [10, 11, 23, 24, 26, 28] It was discovered that the abscess involved either the left, right, or both sides, with a mean volume of 210 cm.

Ascites and pleural effusion were the two problems seen in this investigation. Ascites was noted in 6% of cases, while pleural effusion was observed in 12% (n = 6). Siddiqui et al. observed a similar finding. [8] The current study did not find any additional problems, such as sepsis, multi-organ failure, or mortality. This could be because the condition was promptly and aggressively treated

after an early diagnosis. The current study's smaller sample size is another factor.

## Conclusion

Patients who present at the emergency room with a protracted fever and upper abdominal pain should be suspected of having a liver abscess. Diabetes mellitus and alcohol intake are the two main risk factors for the development of liver abscess. A simple, accessible, non-invasive, and reasonably priced method of diagnosing a liver abscess is ultrasonography. The most important tests to distinguish between a pyogenic liver abscess and an amoebic liver abscess are pus culture and amoebic serology. Low albumin levels, elevated INR, and elevated alkaline phosphatase continue to be reliable markers for liver abscess. The only observed side effects are ascitis and pleural effusion. In this trial, there was very little mortality.

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