

Original Research Article

Clinical and biochemical profile of liver abscess patients

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ABSTRACT

Background: Liver comprises 48% of all the visceral abscesses. It is common in India with 2nd highest incidence due to poor sanitation, overcrowding and inadequate nutrition. Worldwide, approximately 40-50 million people are infected annually with amoebic abscesses. This study aims to observe the clinical and biochemical profile of liver abscess patients so that a prompt diagnosis can be made and early treatment can be given.

Methods: The study was conducted over a period of 1 year on 50 patients of liver abscess. History and physical examination was done. All patients were subjected to complete hemogram, liver function test, coagulation profile (PT/INR) and USG abdomen. Serology for *Entamoeba histolytica* and HIV was done.

Results: The mean age of the patients was 41.8 years with male preponderance. Amoebic liver abscess (86%) was predominant over pyogenic liver abscess (14%). Alcoholism (52%) and diabetes mellitus (20%) are main predisposing factors in case of liver abscess. Hepatomegaly was found in 80% cases. Elevated ALP, low albumin, increased PT INR points to the diagnosis of liver abscess. The abscesses were predominantly in right lobe (76%) and solitary (66%). Complications seen were ascites (12%) and pleural effusion (6%).

Conclusions: Liver abscess should be suspected in patients presenting with prolonged fever and pain upper abdomen specially if patient is alcoholic or has diabetes mellitus. Ultrasonography is an easy and cost effective investigation to diagnose liver abscess. Early and aggressive treatment is the mainstay to prevent complications, morbidity and mortality.

Keywords: ALA, Liver abscess, PLA

INTRODUCTION

Liver comprises 48% of all the visceral abscesses.¹ Liver abscess is the condition which involves collection of purulent material in liver parenchyma due to bacterial, parasitic, fungal, or mixed infections. It is common in India with 2nd highest incidence due to poor sanitation, overcrowding and inadequate nutrition.² Worldwide, approximately 40-50 million people are infected annually with amoebic abscesses. Prevalence of infection is higher than 5%-10% in endemic areas.³ Various studies from rural areas of Central and South America, India, and the tropical areas of Asia and Africa have reported

prevalence rate as high as 55%.^{4,5} Pyogenic liver abscess has an estimated global incidence of 1.1-2.3 per 100,000 person-years and in United States, the incidence is approximately 3.6 per 100,000 and has been rising.⁶ Broadly divided into amoebic liver abscess (ALA) and pyogenic liver abscess (PLA) with majority of amoebic etiology in developing countries and pyogenic in developed countries.⁷ Amoebic and pyogenic abscess share many clinical, laboratory and imaging feature, but they exhibit significant difference in epidemiology and treatment. Hence the differentiation is essential for effective treatment.⁸ In this article, we present the study of clinical, lab parameters and management of suspected

liver abscess patients, so that an early diagnosis can be made and prompt treatment can be started and complications can be prevented.

Aims and objectives

The objectives of the study were as follows:

- To study the risk factors, clinical manifestations and biochemical changes in patients of liver abscesses.
- To study the complications and prognosis of liver abscess.
- To differentiate between amoebic and pyogenic liver abscess.

METHODS

This study was a cross sectional study of patients attending medicine outpatient department (OPD) and emergency department in a medical institute situated in South Delhi, India. After obtaining permission from the institutional ethics committee to conduct the study, patients who satisfied the inclusion criteria and those who gave written informed consent were selected for the study.

Inclusion criteria

- All consenting individuals with the age above 18 years.
- Patients presenting with consistent symptoms of liver abscess.
- Patients diagnosed with liver abscess radiologically (Ultrasonography and CT Scan, if required).

Exclusion criteria

Patients not giving consent for the study.

The study was conducted over a period of 1 year on 50 patients of liver abscess who presented to medicine OPD/Casualty. A detailed history was taken; a thorough physical examination was done. All patients were subjected to complete hemogram, liver function test, kidney function test, coagulation profile (PT/INR) and USG abdomen. Reference ranges of these investigations were defined by the reference ranges of hospital laboratory. Blood and urine cultures were sent. Serologies for *Entamoeba histolytica*, HIV, hepatitis B and hepatitis C viruses were also done. Pus cultures were done whenever the pus was aspirated. Pus was aspirated only when the abscess was liquefied, by then the patients were started on empirical treatment with antibiotics.

RESULTS

A total of 50 patients, 41 (82%) males and 9 (18%) females were enrolled in the study. Male to female ratio was 4.5:1. Maximum number of cases were seen in the

age group of 40-50 years. The mean age of the patients was 41.8 years (range: 18-68 years) (Table 1). Etiological analysis of liver abscess (on the basis of amoebic serology and pus culture) revealed that 86% were of amoebic type (n=43) and 14% 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%)	41 (82%)
	Female	7 (16.3%)	9 (18%)

Amongst the risk factor, alcohol intake was the most common risk factor, contributing to 26(52%) cases in our study. Diabetes mellitus (DM) was found to be another major risk factor, 10% in present study. 12 % of cases had both the risk factors (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%)	1 (14.2%)	10 (20%)
ALC+DM	5 (11.6%)	0	6 (12%)

Pain abdomen (96%) was the most common symptom followed by fever (94%). Hepatomegaly (80%) was the most common per abdominal examination finding followed by abdominal tenderness (72%). 50% cases were found anorexic. 12% cases developed right sided pleural effusion while 6% patients developed ascitis as complications (Table 3).

Table 3: Clinical features of liver abscess patients.

Signs and symptoms	ALA	PLA	Total
Fever	40 (93%)	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 (57.1%)	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%)

On ultrasound examination, right lobe was involved in 76% cases, left lobe abscess in 14% and multiple abscesses (both the lobes) in 10% of the cases (Table 4). On analysis of biochemical parameters, out of 50 patients, 40(80%) had TLC count >11000/mm3. ALP

was raised in 48 (96%) patients. INR was increased in 37 patients (74%) (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 present study, we aspirated the pus only after the abscess was liquefied. Hence pus cultures were negative in 49 out of 50 patients, as the patients were started on empirical antibiotics prior to pus aspiration. Mortality rate in present series was none.

Table 5: Biochemical parameters of liver abscess patients.

	ALA	PLA	Total
TLC >11000/ μ 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

Liver abscess is more common in tropical countries.^{2,7} The common etiological agents for liver abscess are *E. histolytica* (amoebic) and bacteria (pyogenic). Majority of liver abscess cases from developing country are of amoebic etiology.⁷ In present study also ALA accounted for more than three-fourth of cases, most of them being solitary right lobe abscess. This pattern of involvement has also been reported in previous series on ALA by Sharma et al, Mukhopadhyay et al and Ghosh et al.⁹⁻¹¹

The mean age of patients in our study was 41.8 years which was in accordance with Indian studies, Ghosh et al, Sharma et al and Mukhopadhyay et al who reported it to be 41, 40.5 and 43.64 years, respectively.⁹⁻¹¹ Highest incidence of liver abscess was seen in fifth decade of life with similar finding in ALA cases but PLA was present in all age groups in equal frequency. However, studies from west where PLA are more common, average age is above 60years.¹²⁻¹⁴

As far as sex predisposition was concerned, after recruiting 50 consecutive patients, only 9 patients were female. Indian data show predominant male involvement; Sharma et al, Mukhopadhyay et al and Ghosh et al, reported male to female ratio to be 14.4:1, 7:1 and 11:1, respectively.⁹⁻¹¹ However, Pang et al and Heneghan et al reported it to be 2:1 and 1.22:1, respectively.^{12,13}

In present study alcohol consumption was seen as a major risk factor as 58.4% patients of ALA were exposed to it, however only 14.2% of PLA cases were found alcoholic. It is contrary to the study of Islam QT et al which showed that indigenous alcohol has association with the development of pyogenic liver abscess.¹⁵ Ghosh et al had 72% alcoholic patients in their study.¹¹ Alcohol suppresses function of Kupffer cells (specialized macrophage) in liver which has important role in clearing amoeba. Moreover, invasive amoebiasis appears to be dependent on the availability of free iron. A high content of iron in the diet, often obtained from the country liquor in habitual drinkers predisposes to invasive amoebiasis, as does a diet rich in carbohydrate.¹⁶

Diabetes mellitus was another risk factor reported in 20% cases while 12% patients were exposed to alcoholism as well diabetes mellitus. Ghosh et al reported diabetes in 9%, Das et al in 70% patients. Thomsen et al found that diabetic patients had a 3.6-fold increased risk of developing PLA, compared with control subjects.¹⁷

In present study, most common symptoms are pain in abdomen and fever with frequency of 96% and 94% respectively. Ghosh et al reported it to be present in 99% and 94% whereas various other studies quote it in range of 62-94% and 67-87%, respectively.⁹⁻¹¹

Nausea and anorexia were other significant symptoms present in 48% and 50% patients respectively with greater frequency in ALA. Ghosh et al in their study reported 93% patients with anorexia and 54% with nausea and vomiting.¹¹ Cough was another uncommon symptom which was present in 22% patients.

Jaundice was seen in only 18% cases which is in accordance to the trend. It was seen in 26% of patients by Ghosh et al.¹¹ In earlier studies from India, it was reported in 45-50% of patients.¹⁸ But after advent of good antimicrobial therapy, it has become less common. Sharma et al reported it in only 12.7% of patients.⁹ Yoo et al in their study compared data of patients between 1970s and 1980s and reported a fall in incidence of jaundice from 25% to 7% during this period.¹⁹ Diarrhoea was seen in 24% patients in the present study which was also reported by Ghosh et al in 23% and variably from 4% to 33% by previous studies.^{9-11,20-22}

We reported hepatomegaly in 80% cases. Ghosh et al reported it in 89% cases which correlates with present study whereas Das et al found it in only 40% cases which is contrary to present study.^{11,23}

Leukocytosis was observed in 80% patients in the present study with 81.3% and 71.4% frequency in ALA and PLA, respectively. Hence leucocytosis is not an absolute indicator of PLA and cannot be used to differentiate between ALA and PLA. Ghosh et al reported similar findings with leucocytosis in 82% cases.¹¹ Leucocytosis was observed in 68% of cases of PLA in a study done by

Malik and his co-workers.²⁴ Khan et al showed 26.7% polymorphonuclearleucocytosis.²⁵

In present study, serum alkaline phosphatase was elevated in 96% patients with 95% and 100% frequency from ALA and PLA respectively which is in accordance with various previous studies.^{24,26,27} SGOT and SGPT were raised in 64% and 66% patients respectively. Albumin level <3.5g/dL was seen in 88% patients. Similar finding was reported by Ghosh et al also.¹¹ PT INR >1 was recorded in 85.7% PLA cases and 74% total liver abscess cases.

In concern with radiological findings, solitary abscesses were seen in 66% patients and multiple abscesses in 34% patients. Likewise, 65% solitary abscess were found in a study by Ghosh et al.¹¹ Right lobe was involved predominantly in conformity with other various studies.^{10,11,23,24,26,28} Mean volume of the abscess was found to be 210cc with involvement of either right, left or both.

Pleural effusion and ascites were the two complications seen in present study. Pleural effusion was seen in 12% (n=6) cases whereas ascites was observed in 6% cases. Similar finding was reported by Siddiqui et al.⁸ Other complications like sepsis, multi-organ dysfunction and death were not seen in present study which could be attributed to the early diagnosis with prompt and aggressive treatment of the disease. Another reason being the smaller number of sample size of present study.

CONCLUSION

This study was conducted in 50 cases with liver abscess, which can be considered as a tip of an iceberg. It is endemic in tropical countries like India. In present study, ALA is much more common than PLA with male preponderance. Poor sanitation, over-crowding and inadequate nutrition could be the contributing factors. Despite all the limitations in this study, the following conclusions can be drawn, that both ALA and PLA have almost similar clinical features. Mean age of presentation is in fourth decade, however the disease can present in any age group.

Liver abscess should be suspected in patients presenting with prolonged fever and pain upper abdomen to the emergency department. Alcohol consumption followed by diabetes mellitus are the major risk factors in development of liver abscess. Ultrasonography is an easy, widely available non-invasive and cost effective investigation to diagnose liver abscess. Amoebic serology and pus culture are the key tests to differentiate amoebic liver abscess from pyogenic liver abscess. Elevated alkaline phosphatase, low albumin level and increased INR remains the consistent indicators for liver abscess. Pleural effusion and ascitis are the only seen complications. Mortality rate was negligible in this study.

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