

## Study of Demographic, Risk Factors, Clinical, Laboratory, Management and Outcomes in Patients of Liver Abscess from a Tertiary Care Centre in South India

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### ABSTRACT:

**Background:** Liver abscess is the most common cause of visceral abscess worldwide. This study was planned to identify the demographic profile, risk factors, clinical, laboratory parameters and 3 month mortality rate in south India. **Methods:** We analysed patients of liver abscess admitted at JSS Hospital, Mysore from January 2017 till December 2022. A total of 197 patients were included in the study and analysed retrospectively. **Results:** 197 liver abscess patients were included. 81% were males, Higher the age (>50 years), Diabetes were the most common risk factors (13.8%), Fever was the most common symptom (73%) followed by abdominal pain (67.7%) RUQ tenderness was most common sign seen in 67.2% of patients. E coli was the most common organism isolated from pus culture (8.7%) Mortality rate at the end of 3 months was 3.1%. **Conclusion:** Due to rapid urbanization and improved sanitation, mortality due to liver abscess is on the decline, owing to early interventions and antibiotic use.

**Keywords:** Liver abscess, Percutaneous drainage, Percutaneous needle aspiration.

### INTRODUCTION:

Liver abscess is one of the common diseases encountered in clinical practice. It is mainly caused by parasite *Entamoeba histolytica* in Amoebic liver abscess and in Pyogenic liver abscess, it is caused by multiple bacteria. Rare causes of liver abscess

include fungi, mycobacteria and other atypical organisms. In India, amoebic liver abscess accounts for 60% of the cases<sup>1</sup>. The major predisposing factors are alcohol ingestion, diabetes mellitus, malnutrition and immunodeficiency<sup>2</sup>. Rapid urbanization, improved sanitation and hygiene in India in the last few decades have led to reduction

in communicable diseases and emergence of non-communicable disease and injuries<sup>3</sup>. Amoebiasis is endemic in India and primarily affects the gastrointestinal tract. Amoebic Liver Abscess is the most common extraintestinal involvement in amoebiasis, seen in 3% to 9% of cases<sup>4</sup>. Although classically described as a solitary abscess in the right lobe of the liver, 35% of patients may have a left lobe liver abscess with or without a right lobe abscess, and 15% of patients can have multiple liver abscesses<sup>5</sup>. Pyogenic and tubercular liver abscess should always be considered as differential diagnosis while evaluating liver abscess. Recent advances in diagnostic and interventional radiology led to improved management strategies such as minimally invasive percutaneous drainage with reduced duration of hospital stay compared to conservative treatment and favourable outcomes<sup>6</sup>. In addition to the antimicrobial therapy, percutaneous drainage of abscess has become a mainstay of treatment. However, few patients do not respond to percutaneous drainage and deteriorate. It is important to promptly identify such patients for whom open surgical intervention is the definitive treatment.

## OBJECTIVE:

The objective of the present study is to study the changing trends in demographic, risk factors, clinical features, laboratory parameters and management in patients with liver abscess.

## MATERIAL AND METHODS:

It is a cross sectional retrospective observational study conducted in the Department of Medical Gastroenterology, JSS Medical College and Hospital, Mysuru, Karnataka – a tertiary care hospital. Study duration was from January 2017 till December 2022. A total of 197 patients who were diagnosed with liver abscess were included in the study. Inclusion criteria being adult patients, age more than 18 years with clinical features of liver abscess and radiological features on ultrasound or CT abdomen. Clinical features and signs were documented, baseline investigations were done in all cases including CBC, LFT, RFT, Viral markers - Anti HIV I/II, HbsAg and Anti HCV and blood culture. USG abdomen was done in all cases, CECT abdomen was done wherever deemed necessary.

## Statistical analysis:

Data was collected and entered in Microsoft excel worksheet and analysed using SPSS V21 software.

## RESULTS:

Most of the cases were in the age group of more than 50 years (44%). Liver abscess was more common in males (81%) compared to females (19%). Diabetes was the most common risk factor (13.8%) followed by alcohol use disorder (12.3%). Fever was the most common presenting symptom seen in 73% of the cases, abdominal pain was seen in 67% cases. Right upper quadrant tenderness was the most common sign, seen in 67.2% of the cases. Hepatomegaly was seen in 40% cases.

		Count	Column N %
Age_group	Less than 30	14	7.2%
	Between 31 to 40	46	23.6%
	Between 41 to 50	49	25.1%
	More than 50	86	44.1%
Sex	Female	37	19.0%
	Male	158	81.0%
Table 1 : Epidemiology			

		Count	Column N %
Pain abdomen	Yes	132	67.7%
	No	63	32.3%
Fever	Yes	144	73.8%
	No	51	26.2%
Anorexia	Yes	94	48.2%
	No	101	51.8%
Diarrhea	Yes	23	11.8%
	No	172	88.2%
Hepatomegaly	Yes	79	40.5%
	No	116	59.5%
Right upper quadrant tenderness	Yes	131	67.2%
	No	64	32.8%
Pedal Edema	Yes	30	15.4%
	No	165	84.6%
<b>Table 2 : Clinical Features</b>			

		Count	Column N %
Risk factors	No associated factor identified	119	61.0%
	Diabetes	27	13.8%
	Alcohol	25	12.3%
	Chronic Kidney Disease	4	2.1%
	Choledocholithiasis	3	1.5%
	HIV	2	1.0%
	Pulmonary TB	2	1.0%
	Post ERCP	2	1.0%

	Lung abscess	2	1.0%
	Post Cholecystectomy	1	0.5%
	Renal transplant	1	0.5%
	HBV infection	1	0.5%
	Chronic pancreatitis	1	0.5%
	Biliary stricture	1	0.5%
	Steroid use	1	0.5%
<b>Table 3 : Risk Factors</b>			

Right lobe was the most common lobe involved (71.8%) cases. Left lobe involvement was seen in 25.1% of the patients and both lobes were involved in 3.1% of the patients. Solitary abscess was the most common in terms of number of abscesses (47.7% cases aspiration of which revealed anchovy sauce like material and culture revealed no growth suggestive of amoebic liver abscess. Small abscess (<3cms) were present in 50.8% of patients, requiring only antibiotics. Large abscess (>5cms) were managed with percutaneous aspiration (26%) or percutaneous drainage (25.1%) along with

antibiotics. Laboratory investigations were analysed, mean haemoglobin was 11.19 g%, mean total leucocyte counts were 11,016 cells / cumm. History of prior antibiotic use was present in 14.4% cases, all of which revealed no growth on culture suggesting a relation between culture negativity and prior antibiotic usage. 80% of the cases had no growth on culture, of the positive cultures E coli was the most common organism isolated 8.1% followed by klebsiella 5.6%. Severe sepsis / SIRS was seen in 10% of the cases. Mortality rate at 3 months was 3.1% (N=6).

		Count	Column N %
Culture Positive	No Growth	160	82.1%
	E coli	17	8.7%
	Klebsiella	11	5.6%
	Staph aureus	4	2.1%
	Enterococcus	2	1.0%
	Salmonella	1	0.5%
<b>Table 4: Culture Analysis</b>			

		Count	Column N %
Number	1	93	47.7%
	2	74	37.9%

	3	15	7.7%
	4	8	4.1%
	5	3	1.5%
	6	2	1.0%
Site	Right	140	71.8%
	Left	49	25.1%
	Both	6	3.1%
Size	Less than 3 cm	99	50.8%
	Between 3.1 to 6.0 cm	63	32.3%
	Between 6.1 to 9 cm	28	14.4%
	More than 9.1 cm	5	2.6%
<b>Table 5: Abscess Characteristics</b>			

		Count	Column N %
3 months death rate	Yes	6	3.1%
	No	189	96.9%
<b>Table 6: 3 Months Mortality</b>			

		Count	Column N %
Prior antibiotic use	Yes	28	14.4%
	No	167	85.6%
<b>Table 7: Prior Antibiotic Use</b>			

		Count	Column N %
Management	Antibiotic only	94	48.2%
	PCD	49	25.1%
	PNA	52	26.7%

		Count	Column N %
SIRS	Yes	20	10.3%
	No	175	89.7%

**Table 8: Management**

## DISCUSSION:

Liver abscess is a common condition seen in tropical countries like India. Most of the patients were in the age group of over 50 years (44.1%), predominantly affectly males (81%) in accordance with other studies<sup>7</sup>. Diabetes and alcoholism were the most common risk factors in the present study which was comparable to previous studies<sup>2,8</sup>. High alcohol consumption by males increases susceptibility to amoebic liver abscess. Alcohol impairs the ability of Kupffer cells to clear amoeba in the liver. Diet rich in iron content as obtained from country liquor and carbohydrate-rich diet predisposes to invasive amoebiasis<sup>9</sup>. Diabetes mellitus is associated with 3.5-fold increased risk of liver abscess due to impaired leucocyte adherence, chemotaxis, phagocytosis and antioxidant systems, resulting in reduced bactericidal activity<sup>10</sup>.

Majority of the patients presented with Fever (73.8%) followed by abdominal pain (67.7%). This is consistent with report from another study<sup>11</sup> in which pain abdomen (99%) and fever (94%) were the common symptoms reported. Diarrhea was seen in 11.8% of the cases. Right upper quadrant tenderness (67.2%) was the most common sign followed by hepatomegaly (40.5%) in our study. Choudhary V et al<sup>12</sup>, in 2016 reported right hypochondrial tenderness in 98% and hepatomegaly in 50% of the cases in their study.

Right lobe of liver was involved in 71.8% of the cases, left lobe involvement was seen in 25.1%. Both lobes were involved in 3.1% of the patients. Solitary abscess was most common seen in 47.7% of the cases followed by two abscesses in 37.9% of the cases. 50% of the patient had abscess size of less than 3cms which were managed conservatively with IV antibiotics. Similar findings were reported by GK Dhaked et al<sup>13</sup> who found solitary abscess in 67.5% of cases, right lobe involvement in 77.6% of the cases and left lobe abscesses were seen in

11.8% of the cases. 48.2% of the patients were managed with antibiotics alone, third generation cephalosporin and metronidazole. After taking informed consent, under ultrasound guidance, 26.7% of the cases were subjected to per-cutaneous needle aspiration and 25.1% cases required pig-tail drainage along with antibiotics as per culture sensitivity. The decision for intervention was based on size of the abscess (>5cms) and sub-capsular in location (<1cm liver tissue between the margin and abscess). Catheter was removed once the drain output was less than 10ml per day. Of the 51.8% (n=101) cases who underwent intervention, anchovy sauce like appearance of pus was seen in 67.3% of the cases suggestive of amoebic liver abscess. Amoebic serology (IgM) was not done in all cases due to financial constraints. 3.03% (n=6) had presented with rupture of liver abscess and peritonitis who required surgical management. This is in contrast to a study by Mukhopadhyay et al in 2009 who found rupture of abscess in 26% of the cases. The reduction in the incidence of ruptured liver abscess may be attributed to early anti-biotic therapy and early intervention in the form of percutaneous aspiration / pigtail drainage in high risk cases. Pus aspirated from the abscess was subjected to aerobic, anaerobic and fungal culture. E.coli was the most common organism isolated from culture, followed by Kliebsiella. History of prior antibiotic use was present in 14.4% (n=28) cases before they presented to our hospital, pus culture in these patients was negative suggesting a link between culture negativity and prior antibiotic use. Choledocholithiasis was found in 1.5% (n=3) cases who were subjected to ERCP and biliary stenting.

SIRS was seen in 10.3% of the cases (n=20) Mortality at the end of 3 months was analysed and was found to be 3.1% (n=6) out of which 3 patients had multi system disease like Alcoholic hepatitis / MODS, Pulmonary tuberculosis, Pneumonia and Diabetes Mellitus respectively. Mortality rate in other studies range from 2-15%<sup>11</sup>

**CONCLUSION:**

Liver abscess is a major problem in developing countries like India. It is more common among males. Diabetes Mellitus and Alcohol use are the two important risk factors for the development of liver abscess. Culture of the aspirated pus is vital for recognition of organism and appropriate antibiotic therapy, however it may be negative in certain cases with prior antibiotic use. Mortality rate is on the decline owing to early antibiotic use and intervention in the form of percutaneous drainage. The drawbacks of the study are small sample size, retrospective in nature and population represented was from tertiary care center.

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