

Etiopathogenesis, Clinico-Biochemical Profile & Surgical Intervention in Patients with Liver Abscess: A Cross Sectional Observational Study

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Abstract

Background: Liver abscess is a common clinical presentation requiring prompt diagnosis. The clinical symptoms are vague making diagnostic quandary. Imaging modalities are essential to conclude & start early management.

Objectives: To describe the etiopathogenesis, clinical & biochemical profile & management in patients with liver abscess.

Material & Methods: This cross-sectional observational study was conducted at our tertiary health centre from January 2022 to Dec 2022. 80 patients who were diagnosed with liver abscess were recruited. Inclusion criteria was patients with liver abscess, Hydrated cyst of Liver, and not responding to conservative management at the end of 48 hours. Detailed history recording with complete clinical examination was done. The venous blood samples were taken & sent for laboratory assay. Parameters assessed were alcohol intake frequency, socioeconomic class, Complete blood count, kidney function test, liver function test, PT/INR, ultrasound guided aspiration of liver abscess- percutaneous needle or pigtail catheter.

Results: Mean age was 43.3 yrs 12% were females 62% of the patients belonged to low socioeconomic strata with high alcohol intake. In 77% of the patients liver abscess was amoebic & 23% had pyogenic abscess. Clinical presentation of pain abdomen (100%), fever (25%) & anorexia (94%), diarrhoea & cough (18%). Clinical signs noted were hepatomegaly, pallor, jaundice, pleural effusion & splenomegaly. Higher values noted for leucocytes, SGOT, SGPT, alkaline phosphatase, bilirubin, ESR. The abscess was drained by percutaneous needle aspiration in 78%, pigtail drainage in 12% and open surgical drainage done in 10%. The mean duration of hospital stay was 7±4.1 days.

Conclusion: The clinical profile in liver abscess was of young alcoholic male belonging to low socioeconomic class having right lobe solitary amoebic liver abscess. Early diagnosis & intervention favours successful outcome & reduced duration of hospitalization.

Keywords: Nonlinear Analysis, Poincare Plot Method, Heart Rate Variability, Type 2 Diabetes Mellitus (DM 2).

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Introduction

Liver abscesses are purulent infection of the lung parenchyma which may be caused by bacteria & amoebic parasites but protozoa, fungi and helminthes could also be responsible. These are of two types – amoebic or protozoal & pyogenic liver abscess.[1] In developing countries, amoebic type accounts for 2/3rd of all cases & in developed countries, pyogenic type accounts for 3/5th of all liver abscess cases.[2] Amoebiasis mainly affects the gastrointestinal tract with amoebic liver abscess being the most common extraintestinal complication, which is observed in around 3% to 9% of cases.[3] Haque R 2002 in a study on Bangladeshi children reported the prevalence of amoebic abscess to be 5-10% and up to 55% in some areas.[4] Channanna C, 2014 reported India to rank second highest in liver abscess incidences in the world.[5]

Both the types of abscess have many similar clinical signs & symptoms which often delays the proper diagnosis & management. Advanced diagnostic methods in interventional radiology, sonography, CT scan of abdomen has led to an early diagnosis and management of patients having liver abscess with an improved prognosis. Accurate diagnosis is the key to achieve favourable outcomes.[6]

Thus, the present cross sectional observational study was designed to describe the etiopathogenesis & clinico – biochemical profile in liver abscess patients to aid in early surgical intervention, improving the prognosis.

Material and Methods

This cross-sectional observational study was conducted at our tertiary health centre from January 2022 to December 2022. 80 patients who were diagnosed with liver abscess under sonography were recruited

in the study. A written informed consent was taken from all the study participants & detailed nature of the study explained to them. Inclusion criteria was patients with liver abscess, Hydatid cyst of Liver and not responding to conservative management at the end of 48 hours . Exclusion criteria were patients <18yrs age, organised abscess, abscess proximity to large vascular structures in liver & pregnant females.

Detailed history recording with complete clinical examination was done by an experienced surgeon. The venous blood samples were taken & sent for laboratory assay.

Sociodemographic characteristics assessed:

1. Alcohol intake – on the basis of CAGE Questionnaire.
2. Frequency of Alcohol intake – nondrinkers, occasional drinkers (alcohol intake <3 times/week), and regular drinkers (alcohol intake \geq 3 times/week).
3. Socioeconomic class - upper, middle, and lower(on the basis of Kuppaswamy's Socioeconomic Status scale).

Laboratory parameters analysed were:

1. Complete blood count.
2. Kidney function test.
3. liver function test.
4. PT/INR.
5. Ultrasound-guided aspiration of liver abscess- percutaneous needle or pigtail catheter. Aspirate samples were analysed for trophozoites of *Entamoeba histolytica*.

All the patients were started on intravenous Cefotaxime 2.0g iv QID and metronidazole 0.5g iv QID.

Statistical Analysis

Data was put in Microsoft excel 2007 tabulated & analysed using SPSS statistical software version 22. Data was expressed as mean \pm standard deviation, proportions presented as percentages.

Results

The present cross-sectional study recruited 80 patients with liver abscess. 75% of the patients were in 30-70 yrs age range with mean age of 43.3 yrs. Out of 80 only 15 patients were female. 62% of the patients

belonged to low socioeconomic strata with high alcohol intake. In 77% of the patients liver abscess was amoebic & 23% had pyogenic abscess. The clinical symptoms & signs presented & lobe involved in liver abscess patients is shown in Table 1. The values of all the laboratory parameters analysed are presented in Table 2. The abscess was drained by percutaneous needle aspiration in 78%, pigtail drainage in 12% and open surgical drainage done in 10%. The mean duration of hospital stay was 7 ± 4.1 days.

Table 1: Shows the Clinical symptoms & Signs in Liver Abscess patients.

	Parameters	No. of Patients (%)
Symptoms	Pain abdomen	100%
	Anorexia	94%
	Diarrhea	25 %
	Cough	18%
	Weight loss	42%
	Fever	95%
	Nausea/vomiting	56%
Clinical Signs	Pallor	41%
	Hepatomegaly	91%
	Ascites	8%
	Jaundice	28%
	Splenomegaly	12%
	Pleural effusion	33%
Lobe involved	Right	73.5%
	Left	15.7%
	Bilateral	10.8%

Table 2: Shows the values of Laboratory parameters in Liver Abscess patients.

Laboratory parameters	Mean \pm SD
ESR	46 \pm 23mm 1st hr
Hb %	11.3 \pm 1.4
PTINR	1.37 \pm 0.25
TLC	18,372 \pm 8921 μ L
Bilirubin	1.67 \pm 2.72mg/dL
SGPT	70 \pm 52 IU/L
SGOT	90 \pm 93 IU/L
Alkaline phosphatase	594 \pm 431 IU/L
Albumin	2.79 \pm 0.68 g/dL
Urea	45 \pm 41.3mg/dL
Calcium	9.3 \pm 0.7mg/dL

Discussion

In the present study, 75% of the patients were in 30-70 yrs age range with mean age

of 43.3 yrs. Similar pattern of involvement noted in studies conducted by Ghosh et al 20142, Sharma et al. [7], and Mukhopadhyay et al. [8] Most of the

patients were young male of lower socioeconomic class with severe alcoholism. High alcohol intake decreases the function of Kupffer cells in liver which function to phagocytose the amoeba. Also, invasive amoebiasis is dependent on the availability of free iron, which is abundant in country liquor, which predisposes them to invasive amoebiasis.[9] Other predisposing factors are elderly people with co morbid illnesses, compromised immune system, malnutrition & corticosteroid therapy. Similarly, Luo M et al 2016 noted pyogenic liver abscesses to be more common in the middle-aged and elderly.[10] Zhou et al 2021 observed, 57.1% patients more than 60 years old with males predominance.[11]

In the present study, out of 80 only 15 patients were female. Similar observations noted by Sharma et al. [7] and Mukhopadhyay et al. [8] who noted male to female ratio of 7: 1 and 11: 1 respectively. Females have low iron stores, also estrogen stimulates the phagocytic system, & increases the immune response against invasion by *E. histolytica*. [9]

In the present study, amoebic LA was observed in 77% of the patients. Most often the abscesses were solitary involving the right lobe. In the present study about one fourth of the patients had pyogenic LA. It presents as multiple abscesses with involvement of right lobe. Other predisposing factors include biliary tract and colonic disease like acute cholecystitis, biliary-enteric bypass procedures, choledocholithiasis, diverticulitis, chronic pancreatitis, colonic perforation, malignant obstruction of the common bile duct, cholangiocarcinoma, carcinoma of pancreas & colon .[12]

In the present study, most common symptoms were pain abdomen, fever & anorexia, Other minor symptoms were diarrhea & cough (18%). Different studies recorded these symptoms in the range of 65–96%. Diarrhoea occurs due to intestinal amoebiasis & associated colon conditions.

[13,14] Cough which could be attributed to pleuropulmonary spread of the inflammation with pleural effusion & compression collapse of the underlying lung parenchyma which was seen in 33% of the patients. In Ghosh et al study cough & Pleural effusion was present in 16% & 30% patients resp.[2]

Other uncommon clinical signs of LA observed were jaundice (28%) and ascites (8%). Ghosh et al [2] study reported Jaundice in 26% of patients while Sharma et al. [7] noted it in only 12.7% of patients. This may be attributed to biliovascular fistula resulting from hepatic necrosis leading to damage to bile ducts and hepatic veins. Appearance of Jaundice is suggestive of presence of large or multiple abscesses, bacterial infection and derangement of hepatic function.[15] Its presence may worsen the prognosis. Ascites occurs by compression of the inferior vena cava.[13] Nigam et al. noted ascites in 10.5% of patients.[16]

In the present study, leucocytosis was noted with raised ESR, SGOT, SGPT. In all the patients high alkaline phosphatase activity was observed. High mean bilirubin levels in the patients. Similarly, Vandana & Suman 2019 study reported leukocytosis in 42 out of 60 patients. Predominant cells were Polymorphnuclear cells. In 82% cases high alkaline phosphatase levels were observed. [6] As the duration of disease increases the alkaline phosphatase levels increase. The SGPT levels were mildly raised. Serum creatinine level was in normal range.[17]

Qin et al. in a retrospective clinical study in patients with amoebic liver abscess (n=36) observed raised leucocyte count in 61.1% & raised ESR in 88.5% of patients.[18]

Vandana & Suman noted the commonest site of involvement was right lobe of the liver which was 78.3% with had isolated left lobe involvement in 6.7% patients. 6 Sarda et al 2013 study stated frequent

hyperbilirubinemia in obstructive amoebic liver abscess cases which can be managed by surgical drainage.[19]

In the present study, the abscesses were drained by percutaneous needle aspiration in 78%, pigtail drainage in 12% and open surgical drainage done in 10% cases with a mean duration of hospital stay to be 7 ± 4.1 days. Yu SCH et al 2004, showed favorable prognosis with percutaneous drainage procedure reducing the average hospitalization days to conservative management.[20]

Conclusion

In conclusion, liver abscess is a serious condition that requires prompt diagnosis and management. The present cross-sectional observational study highlights the etiopathogenesis, clinical profile, biochemical profile, and surgical management of liver abscess. The study found that the liver abscess was most commonly noted in young males in lower socioeconomic strata with high alcohol intake. It was uncommon in females. The abscesses were mostly solitary with right lobe involvement & amoebic type. Multiple abscesses & those involving left lobe were also observed. Accurate and Early diagnosis using advanced diagnostic methods is crucial in achieving favorable outcomes. Abscess drainage with the use of minimal invasion can prevent mortality & favour a good prognosis. The results of this study may aid in the development of better diagnostic and management strategies for liver abscesses.

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