

Clinical Study of Amoebic Liver Abscess

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Abstract

Background: A clinical study of amoebic liver abscess was chosen because it is the most common cause of liver abscess in a tropical country like India. An attempt was made in this study to define the various symptom complexes, modes of presentation, methods used in diagnosis, treatment options, and complications occurring in amoebic liver abscess. This study showed that the mortality and morbidity were reduced significantly by antiamoebic chemotherapy and minimal invasive ultrasound-guided needle aspiration of the abscess.

Study Design: Case series.

Aim of the Study: To study the etiopathogenesis, various clinical presentations, various investigations to evaluate amoebic liver abscess, treatment options available for management of patients with amoebic liver abscess, and its complications.

Methodology: A series of 50 cases of amoebic liver abscess admitted to our MGM Hospital, Warangal, between January 2015 and September 2016 were studied, inclusive of a follow-up period of 6 months.

Results: The mainstay of management of amoebic liver abscess consisted of antiamoebic chemotherapy and surgical intervention involving ultrasound-guided aspiration, Malecot Catheter drainage, exploratory laparotomy, and drains under local anesthesia. In our study of 50 cases with amoebic liver abscess, complications encountered in 4 cases (8%) with subdiaphragmatic rupture of amoebic liver abscess, 4 cases (8%) with acute renal failure, and 2 cases (4%) with rupture into the peritoneal cavity causing peritonitis. Computed tomography scan established the diagnosis in these complicated cases except for one case in which exploratory laparotomy was directly done for peritonitis and was found to have ruptured amoebic liver abscess. Four cases of subdiaphragmatic rupture with a localized collection of amoebic liver abscess were also treated by Malecot Catheter insertion into the subdiaphragmatic collection. Two patients had ruptured liver abscess, one underwent exploratory laparotomy and drainage of pus. In the other patient, drains were kept under local anesthesia and antiamoebic chemotherapy was given for both of them. There was no mortality in our study. Recurrence was nil up to 6 months of follow-up.

Conclusion: Prompt diagnosis, aggressive medical treatment along with minimal intervention can keep morbidity and mortality associated with this condition to a bare minimum. The scope of surgery in this condition is minimal and limited to cases not responding to medical management and with complications like a rupture. Preventive measures at the individual level and community level can help in eliminating the disease.

Key words: Amoebic liver abscess, Antiamoebic chemotherapy, Ultrasound-guided needle aspiration of abscess

INTRODUCTION

Liver abscess is a common condition in India. India has 2nd highest incidence of liver abscess in the world.

Liver abscess is caused by bacterial, parasitic, or fungal infection.

Amoebiasis is presently the second most common cause of death from parasitic diseases. The World Health Organization reported that *Entamoeba histolytica* causes approximately 50 million cases and 100,000 deaths annually. India being a tropical country and home to 400 million people harboring *E. histolytica*, the causative organism of amoebic liver abscess, it assumes immense importance for a thorough understanding of the same. The vast majority

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of these infections are acquired in the developing world. In a country like India, where the majority of population lives below the poverty line, basic sanitary facilities are lacking. This coupled with overcrowding and urban slums and also outdoor unhygienic eating habits sets the stage for communicable diseases like amoebiasis.

Amoebic liver abscess is not an abscess in the true sense, as pus does not contain pus cells and bacteriologically sterile.

Liver abscess continues to be a disease with considerable mortality in our country. The rising incidence in alcoholics has become a matter of grave concern, as complicated rates are high in this subgroup, leading to increased morbidity and mortality. Locally made alcoholic drinks such as neera and arrack may be the routes of faeco-oral transmission of amoebic cysts.

Primary prevention by improving sanitation, health education, early diagnosis, and prompt treatment preventing complications may result into lowering mortality/morbidity associated with the disease. With the advent of imaging modalities such as ultrasonography (USG), computed tomography (CT) scan, serological tests diagnosis, and management has become easier with a resultant decrease in mortality and morbidity.

This study has tried to delineate the clinical profile, risk factors, and management strategies of amoebic liver abscess.

METHODOLOGY

A series of 50 cases of amoebic liver abscess admitted to our MGM Hospital, Warangal, between January 2015 and September 2016 were studied, inclusive of a follow-up period of 6 months.

Inclusion Criteria

1. All cases of amoebic liver abscess diagnosed clinically, ultrasonographically, and confirmed serologically.
2. Culture and sensitivity of the aspirate were done in all the cases.
3. All cases of liver abscess (evolving, liquefied, and ruptured stage) with or without peritonitis.

Exclusion Criteria

1. Age <18 years not included.
2. Traumatic liver abscess.
3. Recurrent pyogenic liver abscess.

A detailed history, clinical examination, and laboratory profile of the patients were recorded in a predesigned pro forma. Alcoholism was screened as per CAGE questionnaire^[1] depending upon the frequency of alcohol

intake, patients were divided into non-drinkers, occasional drinkers (alcohol intake <3 times a week), and regular drinkers (alcohol intake >3 times a week). Using modified Kuppaswamy's socioeconomic status scale,^[2] patients were divided into three socioeconomic classes: Upper, middle, and lower. All the patients were subjected to complete hemogram, liver function test, kidney function test, and coagulation profile (prothrombin time and international normalized ratio).

The patients were treated depending upon the clinical presentations, response to medical therapy, and size of the abscess, as seen on USG.

- A) Patients with abscess size <5 cm were given anti amoebic chemotherapy only. Antiamoebic chemotherapy consisted of metronidazole 800 mg, 8th hourly for 10 days or 30 mg/kg body weight per day in three divided doses for 10 days, and doxycycline 200 mg orally initially followed by 100 mg daily for 5 days. These patients were managed on an outpatient (OP) basis followed up by USG, except for a few patients who were toxic were admitted.
- B) Surgical intervention in the form of ultrasound-guided aspiration was done for patients with
 - 1) Abscess size more than 5 cm and no clinical response to medical therapy even after 72 h.
 - 2) Patients with impending rupture.
 - 3) Left lobe abscess of any size.

Aspiration was done using 18G lumbar puncture needle and a 20 ml syringe. About 2% lignocaine was used for local anesthesia. Every case was followed up by ultrasound to see the complete evacuation of the abscess. If the aspiration was found incomplete, the position and depth of the needle were changed or even the puncture site was changed till there was adequate evacuation.

- C) Malecot Catheter drainage was done for abscesses >10 cm in loculated ruptured abscess and abscesses which filled up despite repeated aspiration (2–3 times). 8–10 Fr Malecot Catheter was inserted under ultrasound guidance.
- D) Exploratory laparotomy was done for abscess, which had ruptured intra peritonially causing peritonitis. Abdomen was opened by a midline incision, pus was sucked out, following which warm saline wash was given. Abdomen was closed after keeping two drains in the abdominal cavity, one in the pelvis and another drain at the site of the abscess cavity. Patients were given broad-spectrum antibiotics in addition to anti amoebic chemotherapy, intravenous fluids, and blood transfusions as and when necessary.
- E) Drains under local anesthesia were inserted for patients who were not fit for surgery.

The patients were examined daily for clinical improvement. Improvement in pain, fever, anorexia, and hepatomegaly was considered criteria for successful treatment. Mean hospital stay was recorded in each group. Ultrasound was repeated twice a week to look for recurrence or residual collection of the liver abscess.

RESULTS

In our institute, 7243 patients were admitted in the surgery unit between the study period, that is, from January 2015 to September 2016. Among them, the number of cases of amoebic liver abscess was 50 (incidence 0.69%).

In this study, 72% of the patients were between 21 and 50 years. The highest incidence was between 41 and 50 years. The mean age was 48 years in our study.

In this study, there was male preponderance and there were no female patients. Male preponderance may be due to chronic alcoholism in most of the patients.

The highest incidence of amoebic liver abscess is observed in rural areas 37 patients (94%) attributed to lack of proper sanitation, personal hygiene due to low socioeconomic conditions when compared to urban areas-3 patients (6%).

About 94% of patients were from the low socioeconomic class with regard to education, occupation, and per capita income. Alcohol consumption was also more common in low socioeconomic class. The rest were from the middle class.

Alcoholism is one of the major predisposing factors for amoebic liver abscess. Majority of the patients were chronic alcoholics (64%).

Distribution of Symptoms in Patients Studied

Pain (100%) and fever (90%) were the two most common symptoms compared to jaundice (30%) and dysentery (12%) in this study. Dysentery is less common because almost 90% of them are asymptomatic carriers, only 10–12% of them gave a history of dysentery.

Distribution of Clinical Signs in Patients Studied

Right-sided intercostal tenderness was seen in 90% of the patients because amoebic liver abscess is common in the posterosuperior surface of the liver. It is one of the diagnostic signs of amoebic liver abscess. Remaining 10% elicited epigastric tenderness with the involvement of the left lobe of the liver.

Investigations Hematological, Biochemical, and Microbiological Studies in Patients

Neutrophilic leukocytosis was seen in about 72% of the patients.

Alkaline phosphatase (58%), bilirubin (44%), and serum glutamic-oxaloacetic transaminase/serum glutamic pyruvic transaminase (>40 U/L) (44%) were elevated in most of the patients indicating altered liver function.

ELISA test was positive in all cases.

Pus aspirated from abscess was sent for culture and sensitivity in all the cases. Only one case was positive for Gram-negative organisms on culture.

HIV was done in all the cases and was negative.

Amoebic liver abscess is commonly observed in the right lobe (84%) and is a mostly solitary abscess (94%). Multiple abscesses (3%) are rare in amoebic liver abscesses.

Most of the patients who presented with amoebic liver abscess were between 5 and 10 cm size (68%) as they presented late due to low socioeconomic background and treated initially by local quacks. Size is important in the management of amoebic liver abscess.

Management

The mainstay of management of amoebic liver abscess consisted of antiamoebic chemotherapy and surgical intervention involving ultrasound-guided aspiration, Malecot Catheter drainage, exploratory laparotomy, and drains under local anesthesia.

Management of Amoebic Liver Abscess

- Antiamoebic chemotherapy – only antiamoebic chemotherapy was given in 19 patients and remaining 31 patients needed surgical intervention along with antiamoebic chemotherapy 8 patients were <5 cm and 11 patients were 5–10 cm size of liver abscess.
- Ultrasound-guided aspiration was done for all cases on admission with liver abscess >5 cm and liquefied. Out of 42 patients with amoebic liver abscess >5 cm, 34 were between 5 and 10 cm and 8 were >10 cm. All the 8 cases with >10 cm size were treated by Malecot Catheter drainage. Out of 34 patients between 5 and 10 cm, 11 were treated with antiamoebic chemotherapy and responded to it. In the remaining 23 patients, 17 were managed by ultrasound-guided aspiration and out of the remaining 6 patients, 4 had localized rupture among them 1 had undergone direct Malecot drainage, 3 underwent ultrasound-guided aspiration first, not responding to it were followed by Malecot Catheter drainage. Remaining 2 patients had ruptured amoebic liver abscess with peritonitis.
- Malecot Catheter drainage – 8–10 Fr Malecot Catheter was inserted under ultrasound guidance and local anesthesia. Twelve patients underwent Malecot Catheter drainage. Eight were >10 cm and remaining

4 had localized rupture among them 1 had undergone direct Malecot drainage, 3 underwent ultrasound-guided aspiration first, not responding to it were followed by Malecot Catheter drainage.

- Explorative laparotomy was done in a single case of the ruptured liver abscess into the peritoneal cavity with peritonitis.
- Drains under local anesthesia were inserted for one patient as the patient was not fit for surgery from the anesthesia point of view.

Complications of Amoebic Liver Abscess

Out of 50 patients, four presented with rupture into the subdiaphragmatic space (8%) and acute renal failure (8%). Two presented with rupture into the peritoneal cavity with peritonitis (4%).

Duration of Hospital Stay

Patients were categorized into three groups depending on the abscess size on USG:

- Group – A (<5 cm) – Out of 8 patients in this group, 4 were treated on OP basis and 4 were admitted, as they were toxic with an average duration of stay about 6.7 days.
- Group – B (5–10 cm) – The average stay of 34 patients was 14.7 days.
- Group – C (>10 cm) – The average stay of these 8 patients was 20.1 days

DISCUSSION

The WHO estimates that *E. histolytica* causes 50 million cases and 100,000 deaths annually, making this disease the second leading cause of death from protozoal diseases.^[3,4] Although infection with *E. histolytica* occurs worldwide yet, liver abscess is the most common extraintestinal complication in 3–9% of patients.^[5-10] Diagnosis of amoebic liver abscess is straightforward on the basis of epidemiological, clinical, serological, and ultrasonographic findings. Amoebic liver abscess arises from the hematogenous spread of trophozoites of *E. histolytica* from the intestinal mucosa to the liver through the portal vein.

Age

In our study, 72% of the patients were between 21 and 50 years of age.

The youngest being 21 years and oldest 72 years of age.

The highest incidence was between 41 and 50 years of age group (32%) because of the high incidence of chronic alcoholism in this age group coming from rural backgrounds.

Gender

In our study, there was preponderance among the male population (100%).

Rollestan^[11] suggested that the increased incidence in males is probably due to increase alcohol intake predisposing to hepatic congestion.

Alcohol

Alcohol is one of the most common predisposing factors for forming amoebic liver abscess and many patients gave a past history of consuming alcohol (64%).

Dysentery

Dysentery with the passage of blood and mucus in the stool was encountered in only 12% of our cases. About 90% of the infections are asymptomatic and 10% produced a spectrum of clinical symptoms ranging from dysentery to abscess of liver [Table 1].

The most common symptom noted in our series was abdominal pain (100%) followed by fever (90%) and Jaundice (12%). Pain was most commonly felt in the right hypochondrium and intercostal tenderness. Our study is comparable with other studies [Table 2].

Local tenderness confined to the right hypochondrium and intercostal tenderness was the most common elicited clinical sign in 90% of our cases because amoebic liver abscess is common in the right lobe. Remaining 10% had left lobe abscess and 72% had hepatomegaly comparable with other studies [Table 3].

The important hematological and biochemical investigations carried out in our study included hemoglobin, leukocyte count, and liver function tests.

Hemoglobin <10 g% was found in 22% of our patients.

White blood cells count more than 11,000 cells/mm³ was seen in 72% of the patients. Raised alkaline phosphatase was seen in 58% of the cases in our study and raised bilirubin more than 1.2 g% was found in 44% of the cases in our study.

Pus aspirated from the abscess was sent for culture and sensitivity, only one case was positive for Gram-negative organisms on culture, remaining were sterile [Table 4].

X-ray chest was done in all the cases. In 26% of the patients, the dome of the diaphragm was raised on the right side and 26% of the patients showed associated pleural effusion.

USG was done in all our cases, in 76% of the cases, the abscess was in the right lobe of the liver, in 10% of the cases, the abscess was in the left lobe of the liver and 14% of the cases had multiple abscesses, comparable with other studies [Table 5].

Most of the patients who presented with amoebic liver abscess were 5–10 cm size (68%), as they presented late due to low socioeconomic background, went to local quacks for management initially, by the time they came to the tertiary care, size was 5–10 cm.

Table 1: Symptoms

Studies	Abdominal pain (%)	Fever (%)	Jaundice (%)
Mukhopadhyay <i>et al.</i> (2010) ^[12]	83	81	14
Mathur <i>et al.</i> (2002) ^[13]	83	87	30
Khulna <i>et al.</i> (2015) ^[14]	90	94	13
Present study	100	90	30

Table 2: Clinical signs

Studies	Right hypochondrial and intercostal tenderness (%)	Hepatomegaly (%)
Khulna <i>et al.</i> (2015) ^[14]	90	88
Mukhopadhyay <i>et al.</i> (2010) ^[12]	75	82
Present study	90	72

Table 3: Investigations

Studies	Leukocytosis (%)	Alkaline phosphatase (%)	Bilirubin (%)
Qin <i>et al.</i> ^[15]	61		
Yoo <i>et al.</i> ^[16]	78	55	7
Present study	72	58	44

Table 4: X-ray chest

Study	Chest X-ray raised dome of the diaphragm (%)
Mukhopadhyay <i>et al.</i> (2010) ^[12]	32
Present study	26

Table 5: Ultrasonography

Studies	Yoo <i>et al.</i> ^[16] (%)	Rajak <i>et al.</i> 2008 ^[17] (%)	Mukhopadhyay <i>et al.</i> (2010) ^[12] (%)	Present study (%)
Solitary abscess	89	84	94	94
*Right lobe abscess	69	72	84	84
*Left lobe abscess	20	12	10	10
Multiple abscesses	11	16	6	6
Size of liver abscess (cm)				
<5	45	34	17	16
5–10			48	68
>10	55	66	35	16

CT scan was done for 7 patients who were suspected rupture of amoebic liver abscess.

ELISA for amoebiasis was done in all patients and all showed positive results [Table 6].

The management given in our series of 50 patients includes

- 1) Only antiamoebic chemotherapy in 38% of the patients.
- 2) Majority of the patients (34%) were treated by ultrasound-guided aspiration and antiamoebic chemotherapy for abscess size >5 cm, as seen on USG.
- 3) Malecot Catheter drainage was done in 24% of the cases for abscess size >10 cm and complicated localized ruptured amoebic liver abscess with minimal extrahepatic contamination, excluding peritonitis.
- 4) Exploratory laparotomy was done in 2% of the patients for a ruptured liver abscess with peritonitis and
- 5) Drains under local anesthesia were inserted in 2% of patients not fit for anesthesia.

In our study of 50 cases with amoebic liver abscess, complications encountered in 4 cases (8%) with subdiaphragmatic rupture of amoebic liver abscess, 4 cases (8%) with acute renal failure, and 2 cases (4%) with rupture into the peritoneal cavity causing peritonitis. CT scan established the diagnosis in these complicated cases except for one case in which exploratory laparotomy was directly done for peritonitis and was found to have ruptured amoebic liver abscess. Four cases of subdiaphragmatic rupture with a localized collection of amoebic liver abscess were also treated by Malecot Catheter insertion into the subdiaphragmatic collection.

Two patients had ruptured liver abscess, one underwent exploratory laparotomy and drainage of pus. In the other patient, drains were kept under local anesthesia and antiamoebic chemotherapy was given for both of them.

Duration of STAY

All the 50 cases in our study responded to the treatment given to them and were discharged. The average hospitalization time in patients with abscess size <5 cm

Table 6: Management

Treatment modality	Alpesh <i>et al.</i> (2015) ^[18] (%)	Naveen <i>et al.</i> ^[19] (%)	Present study (%)
Conservative antiamoebic chemotherapy	28	58	38
USG aspiration	57	25	34
Catheter drainage	10	14	24
Exploratory laparotomy	5	5	2
Drains under local anesthesia			2

was 6.7 days, patients with abscess size 5–10 cm was 14.7 days, and patients with abscess size more than 10 cm was 20.1 days. In our study, the mean hospital time was 13.8 days.

CONCLUSION

Amoebic liver abscess is the most common extraintestinal complication of intestinal amoebiasis and occurs fairly frequently in Indian population.

High index of suspicion is mandatory for early clinical diagnosis. With the advent of newer imaging modalities such as USG and CT scan, diagnosis has become easier.

Serological tests like ELISA are very useful in the diagnosis of amoebic liver abscess. It has a high sensitivity of 95–100%. The pus aspirated was sterile in 98% cases indicating secondary infection is rare. Early diagnosis and treatment has led to a reduction in morbidity and mortality. High incidence was observed among the lower socioeconomic group and among patients coming from rural areas because of poor sanitary habits, personal hygiene, and history of alcoholism which indicates the need for preventive measures at individual and community levels.

Prompt diagnosis, aggressive medical treatment along with minimal intervention can keep morbidity and mortality associated with this condition to a bare minimum. The scope of surgery in this condition is minimal and limited to cases not responding to medical management and with complications like a rupture.

Preventive measures at the individual level and community level can help in eliminating the disease.

SUMMARY

A clinical study of amoebic liver abscess was chosen because it is the most common cause of liver abscess in a tropical country like India. An attempt was made in this study to define the various symptom complexes, modes of presentation, methods used in diagnosis, treatment options, and complications occurring in amoebic liver abscess. This study showed that the mortality and morbidity were reduced significantly by antiamoebic chemotherapy and minimal invasive ultrasound-guided needle aspiration of abscess.

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