



## ROLE OF IDEAL ANTIBIOTIC REGIME FOR MANAGEMENT OF AMOEBIC LIVER ABSCESS.

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### ABSTRACT

**Background:** Liver abscess is still a challenging situation especially in tropical countries like India. Complication rates are high leading to increased morbidity and mortality. It is therefore necessary to develop realistic guidelines for early diagnosis and management of liver abscess. This article studies the efficacy of different antibiotics in liquefying solid liver abscess and also morbidity associated with it in terms of duration of hospital stay. **Materials And Methods:** This study included patients of solid liver abscess from March 2018 to August 2019. Study groups contains 50 subjects. Subjects were given antibiotics and the results were compared. The demographic data, duration of therapy by follow up USG scan, side effects during study and after study, and various complications were noted. **Results:** In the study, mean age of distribution is 40.32. 41 of 50 were male. Most common presentation is abdominal pain. In 44 cases it was located in right lobe. Comparing efficacy of antibiotics, about 76% of quinolones combined with metronidazole liquified the solid liver abscess than other antibiotics. **Conclusions:** As a routine all liver abscess patients can be started on an antibiotic regime consisting of a combination of Quinolones and Metronidazole as this was found to have caused the abscess to liquify the fastest so as to then drain it. Patients who have allergy to Quinolones can be started on Cefoperazone with Metronidazole. More severe infections with patients showing signs of systemic sepsis can be started on Piperacillin + Tazobactam along with Metronidazole.

**KEYWORDS :** Liver abscess, Antibiotics, unliquified

### INTRODUCTION

Liver abscess is described in literature by Hippocrates as early as 460-377 BC. It is still a challenging situation because of alcoholism, improper sanitation and low literacy rates, especially in tropical countries. It has highly variable presentation which cause diagnostic difficulties. A liver abscess is space occupying lesion, inflammatory in nature, which is caused by various infectious agents. Bacterial and amoebic are the two most common infectious agents causing liver abscess and amoebic liver abscess account for 60% of its cases. India being one of the tropical countries and has millions of people harbouring *E. histolytica*, it is important to study the pathophysiology of liver abscess. Complication rates of liver abscess are high causing increased morbidity and mortality. Because of recent advances in imaging modalities, a more concrete picture to diagnose and treat liver abscess is slowly evolving. These factors are important in India where majority population has low socio economic status and hence it is mandatory to develop appropriate and realistic guidelines for early diagnosis and treatment of liver abscess so that the morbidity and mortality associated with it can be reduced. This article studies the efficacy of different antibiotics in liquefying solid liver abscess and also morbidity associated with it.

### MATERIALS AND METHODS

This study was carried out at a tertiary teaching hospital. Patients were evaluated on admission in wards till discharge and then were serially followed up in OPD. This study included patients of solid liver abscess either diagnosed for the first time or already diagnosed before referral to OPD for a period of 18 months.

This study was performed after the approval of the Ethics Committee of Review Board. A total of 50 patients who met the inclusion criteria were studied. Subjects were given antibiotics and invited to participate in the study with informed consent, and the results were compared.

The demographic data, duration of therapy by follow up USG scan, side effects during study and after study, and various complications were noted. The details of the study were explained to all the patients included in the study. The patient's signed informed consents were taken. Any patient whose follow up was not possible was dropped from the study. The antibiotics given to the patient were noted and serial USG was done to see the liquefaction amount and noted.

### Inclusion Criteria

- Solid liver abscess (Non liquified)
- Age group- 18 to 64 years

### Exclusion Criteria

- Patients not willing for therapy
- Already liquified liver abscess
- Any associated comorbid conditions
- Fulminant liver disease
- Coagulopathy
- Associated diseases like portal hypertension
- Operative cases

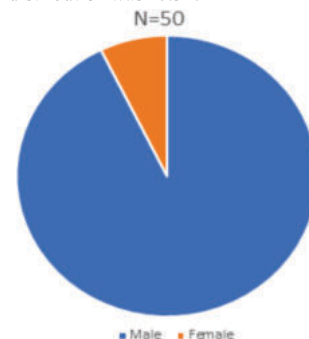
### OBSERVATION AND RESULTS

A total of 50 patients who met the inclusion criteria were studied.

**Table no 1: Age Distribution**

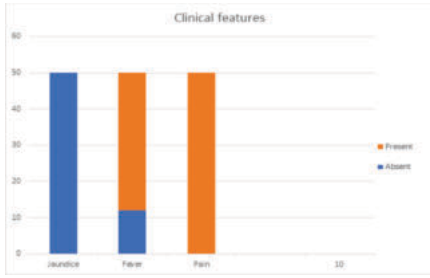
	AGE
N	50
Mean	40.32
Median	44
Standard deviation	18.462
Minimum	13
Maximum	80

The mean age of distribution was 40.32.



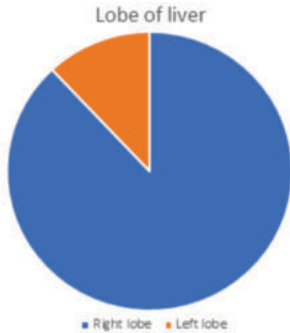
**Table no 2: Sex Distribution**

In this study, out of 50 patients, liver abscess was present in 41 males (82.0%) and 9 females (18.0%).



**Table no 3: Clinical features**

Overall, most common presentation of liver abscess at our institution was abdominal pain, then fever (68%) and almost none presented with jaundice.



**Table no 4: Location of abscess**

Out of 50 cases, in this study the abscess was located in right lobe in 44 cases (88 %) and 6 (12%) were in left lobe of liver.

**Table no 5: I.V. Antibiotics**

	Frequency	Percentage
Inj. Cefoperazone (1gm) +Inj. Metronidazole (500mg)	9	18
Inj. Ciprofloxacin (500mg) + Inj. Metronidazole (500mg)	38	76
Inj. Piperacillin Tazobactam (4.5gm) + Inj. Metronidazole (500mg)	3	6
Total	50	100

Comparing efficacy of antibiotics about 76% of quinolones combined with metronidazole liquified the solid liver abscess than other antibiotics.

**Table no 6: Time required for liquefaction**

N	50
Mean	3.72
Standard error of Mean	0.183
Median	3
Mode	3
Standard Deviation	1.294
Minimum	3
Maximum	6

Maximum time require for liquefaction of solid liver abscess is 6 days and minimum 3 days after giving intravenous antibiotics as mentioned above.

**DISCUSSION**

A liver abscess is defined as a collection of encapsulated collection of purulent material within the liver parenchyma<sup>1</sup>. Liver abscess is a common and serious health problem in our country compared to other developed countries. This is attributed to poor health, sanitation, illiteracy and slum dwellers who use polluted water. As morbidity is common and mortality is not unheard of in liver abscess, its treatment often requires prolonged hospitalization and frequent outpatient visits.

Early diagnosis is based on common clinical symptoms of right upper abdominal pain fever, tender hepatomegaly and jaundice<sup>2</sup>. Prompt treatment prevents the onset of complications which can be general or

local. Common complications include metastatic abscesses to other organs, cutaneous amebiasis and cutaneous lesions leading to hepatic coma, whereas local complications due to extension, rupture, or perforation into adjacent organs include subdiaphragmatic and pulmonary abscesses, intraabdominal ruptures, and peripheral ruptures, mediastinitis, pericardial rupture, myocardial abscess, secondary infection and inferior vena cava (IVC), or Biliary or portal vein compression<sup>3</sup>.

Hematological and biochemical investigations are not diagnostic but they have prognostic significance. Due to the high prevalence of carriers, stool examination is not useful in endemic areas. Serological studies include IHA, enzyme immunoassay and enzyme-linked immunosorbent assay (ELISA). The sensitivity of the IHA test is 90% to 98.1%<sup>4</sup>. In endemic areas, negative test is of significance. In endemic area, the seroprevalence of anti-amoebic antibodies is 8% to 20%<sup>5</sup>. The IHA test remains positive for more than three years after being cured. India is an endemic area and because of the presence of high titers in other forms of invasive amebiasis, IHA as a diagnostic test was not used in our study. Enzyme immunoassays are simple and rapid and it is a cheap test<sup>6</sup>. In patients with amoebic liver abscess, it has a sensitivity of 99% and a specificity of over 90%. Unfortunately, the presence of antibodies may reflect older infections and may be difficult to interpret in endemic areas. For ELISA, detection of anti-amoeboid antibodies with titers greater than 1:320 is considered strong evidence of ALA<sup>4</sup>. Serum antibodies to E. histolytica become positive 1 week after symptom onset and can remain positive for up to 6 months.

Ultrasound & CT scans are the two leading diagnostic modalities with sensitivities of 96-100%<sup>7</sup>. Appearance of liver abscess on USG images is typically hypoechoic, but ranges from hyperechoic to hypoechoic<sup>8</sup>. ALA are classified as non-liquefied or forming liver abscess, partial liquefied, or liquefied liver abscess. CT scans are more sensitive than ultrasound and help distinguish between amoebic and pyogenic liver abscesses, with later showing rim enhancement<sup>9,10</sup>. CT scans can also help diagnose simple cysts, necrotic tumors, multiple liver abscesses, and complex abscesses. Magnetic Resonance Imaging (MRI) has no obvious advantage over CT or ultrasound in typical cases, but it can help differentiate atypical lesions. On MRI, the liver abscess is hyperintense on T2-weighted images and hypointense on unenhanced T1-weighted images. Some liver abscesses show hyperintensity on non-enhanced T1-weighted images, depending on their protein content. After gadolinium administration, liver abscesses show enhancement properties similar to those seen on CT.

Medical management of liver abscess includes administration of intravenous and oral antibiotics. For small liver abscesses, 3 to 5 cm in diameter, treatment with antibiotics alone may be sufficient<sup>11</sup>. Amoebicidal therapy aims to act systemically within the intestinal lumen and wall, particularly in the liver. Antibiotics empirically covering Gram-positive cocci, Gram-negatives, and anaerobes are recommended<sup>11</sup>. Third-generation cephalosporins and metronidazole or piperacillin/tazobactam are commonly used<sup>12</sup>. Luminal amoebicide diloxanide furoate, which directly kills trophozoite, is mandatory after initial treatment with systemic amoebicides. For drug therapy, duration should be based on individual experience and institutional protocol. The literature on this subject is divided. The patient is usually initially treated with intravenous antibiotics followed by a course of oral (PO) antibiotics. The recommended range of duration is 3 weeks IV plus 1-2 months per oral to 2-3 weeks IV plus 1-2 weeks per oral<sup>10</sup>. Pharmacotherapy and radiological interventions are routinely used in the Indian scenario and it helps to accelerate recovery. This is an important message not emphasized in the literature. Early treatment of intestinal amoebiasis and fundamental issues of hygiene, public health and education need to be re-emphasized.

Needle aspiration or percutaneous catheter drainage are included in radiological intervention. Liver abscesses can be drained under US or CT guidance either by needle aspiration or by insertion of a pigtail catheter drain<sup>1</sup>. For percutaneous needle aspiration, a 16- to 18-gauge needle is inserted into the abscess cavity and aspirated until the cavity is completely drained<sup>13</sup>. Similarly, during percutaneous catheter drainage, an 8-14 F pigtail catheter is inserted into the lesion and left in cavity. It then drains by gravity until cavity is empty<sup>12</sup>. Several studies have found percutaneous catheter drainage to be more effective than percutaneous needle aspiration due to its higher success rates<sup>13,14</sup>.

Routine aspiration of amoebic liver abscess is generally not indicated

for either diagnostic or therapeutic purposes, although the philosophy differs in the Indian context. Studies have demonstrated that recovery is accelerated when the intervention is combined with anti-amoebic therapy. In our study, patients using the combined approach had rapid initial clinical responses and, even if large, did not cause complications. Although the literature often emphasizes that medical therapy is sufficient, our study found that most patients in the population had large abscesses or multiple abscesses, and therefore combined approach of medical therapy plus radiological intervention is more effective. We show that the combined approach is more effective. Needle aspiration significantly reduces subjective symptoms such as pain, and early cavity size reduction even in uncomplicated 4-6 cm abscesses. However, no change was seen in long-term resolution of the abscess cavity (6 weeks). Radiological interventions were uncomplicated and had no morbidity or mortality.

A prerequisite for intervention is a normal coagulation profile and the absence of ascites. Liver abscess drainage and medical management are indicated for (1) An abscess in the left lobe of the liver, (2) an abscess with a thin border (<10 mm) of hepatic parenchyma surrounding it (3) multiple liver abscesses, (4) an impending rupture detected by imaging, and (5) failure to respond to medical therapy after 3-5 day<sup>3</sup>. Surgery is rarely necessary, and in ruptured abscesses with systemic peritonitis and sepsis, where an adequate peritoneal toilet with drainage is the mainstay, immediate surgery is indicated<sup>14,15</sup>.

Open surgical drainage has a high mortality rate and should only be used when the abscess ruptures into adjacent internal organs, especially the pericardium or abdominal cavity. Adequate peritoneal toilet with drains is the mainstay. Laparoscopy is a useful tool if the diagnosis is in doubt. However, for focal ruptures, USG-guided pigtail drainage combined with drug therapy is equally effective<sup>16</sup>. Predictors of adverse outcome or recurrence include gross hepatic dysfunction, cirrhosis, multiple or complex abscesses, HIV/AIDS, immunosuppression, and alcohol abuse.

In this study 50 patients who met the inclusion criteria were admitted in our institute and included in our study. The mean age of distribution of liver abscess is 40.32 years. Most of subject in study diagnosed with liver abscess were Alcoholic (28.8%) and 2nd most were Smokers (13.5%), Tobacco chewer (9.6%).

In our study, liver abscess was present in 41 males (80%) and 9 were females (20%). Most common presentation was abdominal pain almost (100%), then fever (68%) out of 50 patients during examination.

Out of 50 cases, On USG abscess was located in right lobe of liver in 44 cases (80%) and 6 cases over the left side. In this study, most of the abscesses were solitary. Out of 50 patients in our study, 28 patients (56%) responded to medical management alone (i.e. Intravenous antibiotics) and 22 patients (44%) were treated by USG guided aspiration or drainage after complete liquefaction of liver abscess and abscess measuring more than 5cm.

Out of the 50 cases in this study, minimum 3days and maximum of 6days course of I.V antibiotic was required for liquefying of solid liver abscess. In our study combination of quinolones and metronidazole (76%) I.V antibiotic found to be more efficacious than cephalosporins and other antibiotics.

## CONCLUSIONS:

Intravenous antibiotics are 1st choice of treatment in Liver Abscess and decrease chance of mortality and interventions. 1st choice of antibiotics for liquefaction of solid liver abscess are Quinolones and Metronidazole combination. Minimum of 3 days required for complete liquefaction of Solid liver abscess by using intravenous venous antibiotic and decreases the stay in hospital. Thus, as a routine all Liver abscess patients can be started on an antibiotic regime consisting of a combination of Quinolones and Metronidazole as this was found to have caused the abscess to liquify the fastest so as to then drain it.

Patients who have allergy to Quinolones can be started on Cefoperazone with Metronidazole.

More severe infections with patients showing signs of systemic sepsis can be started on Piperacillin + Tazobactam along with Metronidazole.

These can act as mere guidelines for clinicians treating Liver Abscesses and help them deal with a common tropical illness.

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