



CLINICAL, LABORATORY AND RADIOLOGICAL PROFILE OF PATIENTS WITH LIVER ABSCESS AN OBSERVATIONAL STUDY

Medicine

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ABSTRACT

Background: About two-thirds of liver abscess cases are due to amoebic etiology in the developing countries, but most abscesses are of pyogenic etiology in developed nations. In tropical countries like India, LA is a common problem and remains a diagnostic and therapeutic challenge for the treating physician. India is the home to several million people affected by *Entamoeba histolytica*, the causative organism of amoebic liver abscess (ALA). Due to the increasing trend of alcoholism, diabetes mellitus, compromised immune status, this problem is of paramount significance as it may lead to a moribund state. Due to the advancement in imaging modalities, safer methods to treat liver abscesses are slowly evolving, especially since the past 20 years. **Methods:** Sample size: 50 cases (n=50). Selection of patients: patients admitted to Medical Wards of Government General Hospital, Kakinada with a confirmed diagnosis of LIVER ABSCESS were taken up for the study and followed until discharge from the hospital. Data collection: Data was collected by a pre-tested questionnaire. Data was collected from all the study population by direct interview after getting informed written consent from them. **Data analysis:** Data analysis was performed both manually and by using a computer. Calculated data were arranged systematically, presented in various tables and figures, and statistical analysis was made to evaluate the objectives of this study using SPSS software. **Results:** The present study included 50 patients (n=50) presented to Government General Hospital, Kakinada, who were diagnosed with liver abscess. Out of the 50 patients, 48 were men, and 2 were women. The youngest patient in this study is 22 years old, and the most aged 60 years of age. **Conclusion:** Etiological analysis of pus revealed anchovy sauce appearance in 72% cases and purulent pus in 28% of cases. Pus culture revealed 72% were sterile and 28% having a bacterial culture. Among the bacterial culture, *Escherichia coli* had the highest incidence of 12%, followed by *Klebsiella* and *Staphylococcus aureus*. Treatment constituted medical therapy and needle aspiration. Empirical treatment forming amoebicidal and antibiotics were started and modified if deemed necessary after etiological diagnosis. Most of the patients with solitary liver abscess needed a single ultrasound guided aspiration, whereas multiple liver abscess patients required more than one aspiration. Good results were obtained by this method. The average hospital stay was 10.2 days. There was no mortality in this study.

KEYWORDS

Abscess D000038, Liver D008099, Anti-Bacterial Agents D000900

INTRODUCTION

Hippocrates described Liver abscess around 460-377 B.C. Liver abscess (LA) is a collection of purulent material in the liver parenchyma. It can be of parasitic, bacterial, fungal, or mixed etiology. A liver abscess is an entity occurring more frequently in tropical countries, representing 13% of abdominal, and 48% of visceral abscesses. It is a common condition worldwide more common in tropical countries due to inadequate sanitation, overcrowding, and poor hygiene. The past four decades have seen a change in the epidemiologic and etiologic profile of LA. There is an increased incidence of new cases, particularly those being transmitted in Southeast Asia. Initially, open surgical drainage was considered the treatment of choice. Better imaging, along with ultrasound-guided percutaneous needle aspiration and drainage, has brought dramatic changes in the pattern of therapy for liver abscess and length of stay in hospital.

Aim and objectives

1. To study in detail, the clinical features of live abscess in patients admitted to medical wards of Government General Hospital, Kakinada
2. To know the site, size, and the number of the abscess with the help of ultrasonography.
3. To study the laboratory findings and microbiological etiologies in patients with liver abscess.
4. To evaluate the ever-changing trends in the clinical profile, microbiological etiology, and ultrasonographic features of liver abscess.

MATERIAL AND METHODS

Study approval: Before conducting this study - Ethical Committee of Rangaraya Medical College and Government General Hospital, Kakinada had approved the protocol. **Place of study:** Government General Hospital, Kakinada. **Period of study:** Duration starting from November 2017 to August 2019. After taking informed consent, patients admitted to the medical ward with a confirmed liver abscess will be examined in detail, and thorough clinical history is taken as per the proforma. Thorough physical examination is conducted on each patient. Baseline investigations, as routinely required and relevant

blood investigations followed by imaging studies such as ultrasonography of Abdomen and x-ray chest pa view were done. Coagulation testing by BT & CT was done bedside. PT & INR were sent to the laboratory. The reference values of these investigations were defined by the value ranges of the hospital laboratory. After taking written consent, all abscess with size >100ml percutaneous USG guided aspiration is done under aseptic conditions after giving Vitamin-K injections empirically, and the pus is sent for culture study. Till pus culture report is received, patients would be empirically started on intravenous cephalosporin, and intravenous metronidazole along with chloroquine (oral) treatment was modified later according to etiological diagnosis. Repeat aspiration was considered as per requirement. Discharge criteria are regarded as normalization of hemodynamic status and defervescence of the presenting complaints.

Management Of Liver Abscess

Liver abscess was managed by percutaneous aspiration. All the study subjects had aspirations. Single aspiration was done in 26 patients (52%). Repeated aspirations were done in 17 individuals. Most of the multiple liver abscess individuals needed more than one aspiration. Three patients who needed multiple aspirations with large abscess was put on percutaneous drainage by pigtail catheterization. In the present study, all subjects were empirically started with metronidazole, chloroquine, and broad-spectrum antibiotics like 2nd and 3rd generation antibiotics like cephalosporins, and depending upon the etiological diagnosis were continued with an effective regimen. Aminoglycosides were added in patients with pleuropulmonary complications. The three patients in this study who presented with shock recovered with intensive management. Patients with multiple liver abscesses were subjected to many aspirations as compared to a solitary abscess in this study

Inclusion criteria

Patients aged >18 years diagnosed with liver abscess based on the clinical, radiological features needing intervention with Abscess of size >6cms or >100ml quantity.

Exclusion criteria

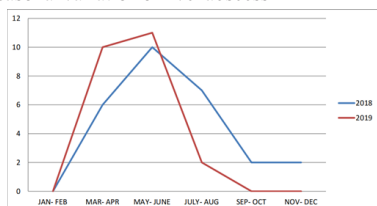
- 1) Who were less than eighteen years,

- Who have organized abscess, and abscess close to large vascular structures in the liver and those in pregnancy.
- Traumatic liver abscess having other liver diseases such as malignancies.

RESULTS

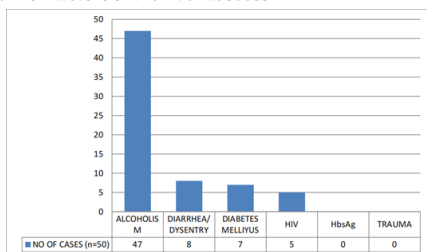
Out of the 50 cases of liver abscess, the majority occurred in the 3rd, 4th, and 5th decades. Most of them were male patients (48) as compared to only two females. During both years of study, most of the cases occurred during the dry season i.e., summer months. Peak incidence was from April to July months (Fig-1).

Figure 1: Seasonal variation of liver abscess



The significant risk factor identified in the present study is chronic alcoholism. It was found in 47 patients (94%). The majority of patients (38) consumed non-refined alcohol in the form of toddy or arrack (cheap liquor). The average alcohol intake was about 200- 1000ml per day over 2-20 years. Another h/o diarrhea/dysentery is present in only 8 cases (16%) of liver abscess. In the study group, seven patients had diabetes (14%) (Fig-2).

Figure 2: Risk factors of the liver abscess



The most common presenting symptoms of liver abscess were abdominal pain (96%) and fever (92%). The other common presenting symptoms include right lower chest pain (46%), breathlessness (26%), jaundice (16%), dysentery (16%), and referred pain to right shoulder (12%), cough with expectoration (10%). The classic symptoms of liver abscess, such as pain abdomen and fever, were present in almost all cases.

The symptoms; right hypochondrial pain and breathlessness were associated with pleural effusion and pleurisy. Diarrhea/dysentery was seen only in 16% of cases, which usually predisposes to ALA.

The common signs of liver abscess in the present study were intercostal tenderness (98%), hepatomegaly (80%), and abdominal mass (32%). Icterus has been observed in 10 patients (20%). Liver abscess diagnosis was mostly based on high clinical suspicion in endemic areas followed by radiological diagnosis. On palpation of the abdomen, Intercostal tenderness was appreciated in 49 patients, hepatomegaly was recognized in 40 patients, and mass per abdomen was seen, in 16 patients. Icterus was seen in 10 patients.

Fourteen patients (28%) presented with atypical manifestations. The most common atypical signs include absence of hepatomegaly in six patients (12%) and ascites with pedal edema eight patients (16%)

Ultrasonographic Features Of Liver Abscess

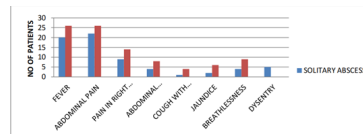
Among 50 patients of liver abscess, isolated right lobe involvement was observed in 36 patients (72%), separated left lobe abscess in 2 patients (4%), while combined involvement of both lobes was seen in 12 patients (24%). Multiple abscesses were seen in 56% of cases, while single amoebic liver abscesses were found in 44% only. Among the right lobe abscess (36), a solitary abscess was more frequent than multiple abscesses in the ratio of 20:16. Usually, a solitary right liver abscess was seen in ALA compared to PLA About 98%, i.e. (49 patients) of our study population, belonged to a lower socioeconomic group, and only 2%, i.e. (one patient), belonged to the middle

socioeconomic group. None of the patients belonged to the upper strata of the society in this study.

Comparison Of Clinical Features Among Solitary And Multiple Liver Abscesses:

The Incidence of Presenting Symptoms like breathlessness (32.1%), abdominal fullness (28.5%), jaundice (21.4%), cough, and expectoration (14.2%) were more frequently associated with multiple liver abscesses than the solitary liver abscess. Multiple liver abscesses are associated with more complications in comparison to solitary liver abscess. PLA is usually associated with jaundice and breathlessness. Multiple Liver abscesses were typically associated with abdominal fullness, which can be complained about by the patient and can be found by the examiner. It was associated with pain abdomen. Solitary liver abscess in the right lobe was present in ALA (Fig-3.)

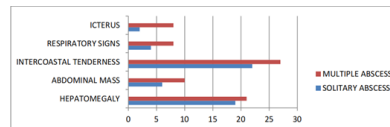
Figure 3: Comparison of clinical features among solitary & multiple abscess



Comparison Of Laboratory Parameters Between Solitary And Multiple Liver Abscesses

Abnormal laboratory parameters among the 50 cases of liver abscesses include elevated serum bilirubin (20%), elevated SGPT (24%) elevated SGOT (30%) elevated alkaline phosphatase (24%) and decreased serum albumin (10%). Among these parameters, elevated serum bilirubin was more frequently observed in multiple liver abscesses (28.5%) as compared to only 9% in the solitary liver abscess (fig-4).

Figure 4: Comparison of clinical signs among solitary and multiple abscesses



Etiological Analysis

All the patients enrolled in this study were subjected to percutaneous pus aspiration under ultrasonographic guidance. The first appearance of pus in 72% was anchovy sauce, which indicates ALA etiology. In 28% (14 cases), the discharge was purulent, mostly suggestive of PLA or bacterial contamination of ALA.

Analysis Of Pus Culture Among The Patients Group

Pus aspirated was collected in a sterile container and sent to the microbiology lab for pus culture. In 72% (36 cases), culture was sterile, indicative of ALA. Most of these cases were a solitary abscess in the right lobe. 28% (14 cases) showed bacterial etiology. E.coli was the most commonly isolated bacteria, with 12% (6 cases)

DISCUSSION

Out of 50 consecutive patients, (n=50) only two patients were female. Male: female ratio was 24:1. Indian data show predominant male involvement; Sharma et al., Mukhopadhyay et al., and Ghosh et al. reported male: female ratios of 14:1, 7:1, and 11:1, respectively. [1,2,&3]

In the present study, 96% of the cases were males. The reasons for this male preponderance remain obscure, but a high incidence of intestinal amoebiasis and alcohol abuse may be the factors behind the high prevalence in males. The hormonal milieu in the females may protect against the disease. Reddy and Thangavelu observed and proposed that the female menstrual cycle prevents hepatic congestion and thus makes the liver less susceptible to abscess formation. [4]

The mean age of the study population was 40.94 years (n=50), which was in accordance with Indian studies, Ghosh et al., Sharma et al., and Mukhopadhyay et al., reported it to be 41, 40.5, 43.64 years, respectively. [1,2,&3] Alom Siddique et al. and Khan et al. reported a peak incidence of age between 21 -50yrs[5,6]. Usually, chronically habituated alcoholics reach the nadir of disease by the 4th decade likely to complete 10-20 years of alcohol consumption. The maximum number of cases were recorded during summer months (March to July)

of 2018 and 2019. This can be attributed to increased alcohol consumption during the dry season, especially toddy. Similar trends were observed in a recent study in Sri Lanka by Selvam Kannathasan et al., where most of the cases occurred during summer months compared to the wet or rainy season[7].

Ramani et al. had reported alcoholism in 64% of their study subjects; similar findings have been reported by various other researchers [8].

In a recent study, Priyadarshi et al. have found that 95% of 117 patients with ruptured ALA had a history of toddy consumption[9]. Alcohol suppresses the function of Kupffer cells, which are the specialized macrophages in the liver, which has an essential role in amoeba. Moreover, invasive amoebiasis is probably dependent on the availability of free iron. A high content iron intake often obtained from the country liquor in habitual drinkers predisposes to invasive amoebiasis, as does an in the carbohydrate-rich diet[7].

Diabetes mellitus was reported in 7 cases (14%) cases, while five patients were had alcoholism as well were diabetes as combined risk factors. Ghosh et al. reported diabetes in 9%, Thomsen et al. found that diabetic patients had a 3.6-fold increased risk of developing PLA, compared with control subjects. [3,10] Among the present study group, five patients (10%) were HIV seropositive. Immune suppression is a significant risk factor for ALA. In a 15-year study in North Korea, 90% of patients having CD4 cell counts <350/mm³ had a liver abscess, which implies that immune suppression by HIV infection may be another risk factor for Amoebic liver abscess[11]. The most common presenting symptoms of patients with liver abscess were abdominal pain (96%) along with fever (92%). Ghosh et al. reported it to be present in 99% and 94%[3]. Alom Siddique et al stated presence of fever in 89% and 100%, jaundice in 0% and 8.33%, nausea and vomiting in 39% and 50%, dysentery in 6% and 0%, productive cough in 15% and 0%, lower chest pain in 30% and 66%, breathlessness in 30% and 50% in ALA and PLA respectively[5].

The most important physical sign in the liver abscess was tender and enlarged liver. In earlier studies from India, jaundice was reported in 45–50% of patients[12]. But after the advent of good antimicrobial therapy, it has become less frequent. Sharma et al. reported jaundice in only 12.7% of patients[1]. Yoo et al. in their study compared data of patients between 1970s and 1980s and published a fall in the occurrence of jaundice from 25% to 7% during this period[13]. In the present study, jaundice was more frequent in patients with multiple abscesses (28.5%) than in patients with solitary abscess (9.4%), suggesting that the multiplicity of the abscess is an essential factor for the occurrence of jaundice in liver abscess. It was also reported in a study by Anil Kumar Sarda et al. to be more common in patients with multiple abscesses (43%) than in those with a single abscess (33%), and furthermore directly proportional to the size of the abscess[14].

In a study by Malik et al., Liver abscesses mainly affected the right lobe (92%) of liver whereas the left lobe (2%) and both lobes (6%) were affected in the minority of the cases. The majority of the cases had a solitary abscess cavity (81%), while multiple abscess cavities were present in 19% of the cases[15]. In the present study, the mean size of a liver abscess was found to be 7.03 cm, with the smallest being 6 cm and the largest abscess being 13 cm. Serum albumin is an essential independent prognostic marker in cases of liver abscess as per some studies in order to make therapeutic decisions[16]. Low serum Albumin level was recorded in 85.7% PLA cases and 74% total liver abscess cases[15].

In a study by Soumik Ghosh et al. they aspirated anchovy sauce pus in 71% patients and purulent in 29 % [3]. The research carried out by Rajak CL et al. showed that 67% of patients had an amoebic subtype. In another recent study in 2018 by Jayakar SR et al., 61.81% of patients were found to have an amoebic liver abscess, and 38.18% of patients were found to have a PLA. This study has comparatively similar trends to that of recent studies in other parts of the country. Etiology in positive pus culture in Soumik Ghosh et al., study, was E.coli 8.5 %, klebsiella 5.5 %, pseudomonas 2%, and staphylococcus in 2% of cases respectively[3]. Escherichia coli has been observed to be the organism most frequently isolated in western series. However, Asian series have reported Klebsiella to be the most commonly isolated bacteria. Rajak et al. reported a success rate of 60% with needle aspiration. [17]

Limitations of the study: The study population is small. The no. of cases was not sufficient to draw comprehensive conclusions as to the

phenomenon of an iceberg that exists.

CONCLUSION

Etiological analysis of pus revealed anchovy sauce appearance in 72% cases and purulent pus in 28% of cases. Pus culture revealed 72% were sterile and 28% having a bacterial culture. Among the bacterial culture, Escherichia coli had the highest incidence of 12%, followed by Klebsiella and Staphylococcus aureus. Treatment constituted medical therapy and needle aspiration. Empirical treatment forming amoebicidal and antibiotics were started and modified if deemed necessary after etiological diagnosis. Most of the patients with solitary liver abscess needed a single ultrasound guided aspiration, whereas multiple liver abscess patients required more than one aspiration. Good results were obtained by this method. The average hospital stay was 10.2 days. There was no mortality in this study.

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