

SPECTRUM OF LIVER ABSCESES IN KUMAUN REGION OF UTTARAKHAND: A HOSPITAL BASED OBSERVATIONAL STUDY

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Abstract

Background: Liver abscess (LA) is defined as a collection of purulent material in the liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infections. Liver abscess is broadly classified into amoebic liver abscess(ALA) and pyogenic liver abscess(PLA) respectively. The present study was conducted to evaluate the etiology, clinical profile and management of liver abscess patients in the Kumaun region of Uttarakhand. **Materials and Methods:** A detailed history, clinical examinations and relevant investigations were performed in all the liver abscess patients. The investigations performed included routine blood investigations, chest x-ray-PA view, X-ray abdomen-AP view, ultrasound abdomen(USG), CECT scan abdomen (if needed). Amoebic serology was done and culture and sensitivity of the aspirate was performed. **Result:** Data was analyzed by using simple statistical methods with the help of MS-Office software. **Conclusion:** From the present study we conclude that in the Kumaun area of Uttarakhand, liver abscess is commonly seen in the middle age groups with a male preponderance. The commonest etiology is ALA. Amoebic liver abscess is commonly seen in alcoholic patients. Abdominal pain, fever and abdominal distension are the common clinical symptoms. Tenderness of the right hypochondrium and intercostal region and hepatomegaly are the common clinical signs of liver abscess. Right lobe of the liver is the commonest involved area of LA. Most of the patients can be managed by percutaneous USG guided single aspiration. If aspiration fails, percutaneous catheter drainage is a very effective modality for the management of LA. A very prompt recognition of symptoms and signs of LA is important in initiating effective management and achieving good outcomes. Because of the nonspecific symptoms and laboratory findings, the presence of predisposing factors can be helpful in increasing the level of diagnostic suspicion. Hence, the key to successful outcome in the management of liver abscess is early diagnosis and appropriate therapy.

INTRODUCTION

Liver is the most common site for abdominal visceral abscess and liver abscess is a major tropical disease of the gastrointestinal tract(GIT).^[1] It is a common condition encountered by surgery department worldwide. Liver abscess (LA) is defined as collection of purulent material in the liver parenchyma which can be due to bacterial, parasitic, fungal or mixed infections. Liver abscess is traditionally classified into two broad categories namely amoebic liver abscess(ALA) and pyogenic liver abscess(PLA) respectively. Out of the total incidence of LA, approximately two-thirds of the cases in developing countries are of amoebic etiology and three-fourths of the cases in developed countries

are pyogenic.^[2] ALA is more common in the developing nations.^[3] PLA constitutes the bulk of hepatic abscesses in developed nations. PLA results most commonly from biliary tract source(CBD stones more commonly in the developing world and cholangio-carcinoma in the developed world), followed by portal venous spread of GIT infections(diverticulitis, appendicitis, pancreatitis, perforations etc.), septicemia through bacterial dissemination in hepatic arterial circulation(e.g. endocarditis), direct spread(by sub-diaphragmatic abscess, lung abscess, peri-nephric abscess etc.) and lastly trauma. Escherichia coli is the most common etiology of PLA in western world, Klebsiella is the most common etiology in Asian countries and Staphylococcus is the most common etiology in

children with chronic granulomatous diseases and hematological malignancies.^[4]

The risk factors for PLA are diabetes mellitus, cirrhosis of liver and chronic renal failure. PLA is usually seen in middle age group without any significant sex, genetic or ethnic predilection whereas ALA is classically seen in a young alcoholic male with a recent history of travel to the endemic country. Diagnosis of LA is usually made with the classical clinical features coupled with radiological confirmation usually by ultrasound abdomen(USG) and rarely contrast enhanced CT abdomen(CECT). USG guided serial aspirations of pus from liver or USG guided pig tail drainage serves both the diagnostic role as well as therapeutic role especially in cases of PLA. Blood cultures are an important adjunct in the diagnosis of PLA especially in septicemia and though their yield may be poorer in comparison to pus aspirations from liver, they may provide helpful information in LA patients guiding the most appropriate antimicrobials. It is recommended to perform a blood culture for any patient suspected of liver abscess.^[5]

Serology plays a vital role in the diagnosis of ALA especially in travelers who have returned after visiting areas of high endemicity of amoebiasis and live in the areas of low endemicity. However due to long-term positivity following exposure, it is of less value in high endemicity settings where patients may have been previously exposed.^[6] The test can also be falsely negative in cases of acute presentations, patient's low immunological status, the different type of serology test or the different pathogen strain.^[7] The clinical presentation of both amoebic and PLA is indistinguishable however PLA patients are more prone for septicemia and may present with high grade fever and a toxic look. Otherwise patient usually present with fever and right upper quadrant tenderness.^[8]

The present study was conducted to evaluate etiology, Clinical profile, management and prognosis of liver Abscess patients in the Kumaun region of Uttarakhand.

MATERIALS AND METHODS

This present study was conducted in the LA cases admitted in the department of Surgery, Government Medical College, Haldwani during a period from February 2020 to July 2023. Attendants/entire subjects signed an informed consent approved by the Institutional ethical committee. A total of 100 diagnosed cases of LA between 20 to 80 years of age and of both sexes were included in this study. Exclusion criteria of this study was age<20 years, hydatid cyst of liver, solid masses of the liver, primary and secondary malignancy of liver.

Methods

A detailed history, clinical examinations and relevant investigations were performed in all the liver abscess patients. The investigations performed included

routine blood investigations, chest X-ray-PA view, X-ray abdomen-AP view, ultrasound abdomen(USG), CECT scan abdomen (if needed). Amoebic serology was done and culture and sensitivity of the aspirate was performed. All the patients after the diagnosis of LA were given broad spectrum iv antibiotics and supportive management and decalculation of antibiotics was done as per the culture and sensitivity reports. Subsequently as per the clinical scenario, conservative management, single USG guided aspiration, multiple USG guided aspirations, per-cutaneous USG guided pigtail drainage or laparotomy and drainage was chosen.

RESULTS

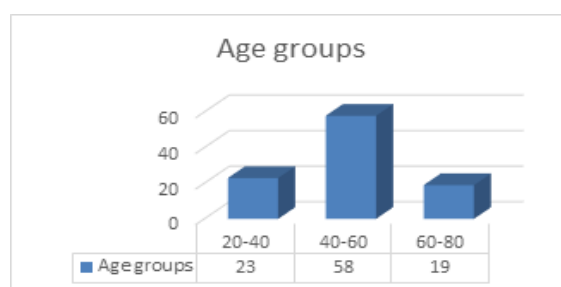


Figure 1: Age Groups of Liver Abscess patients

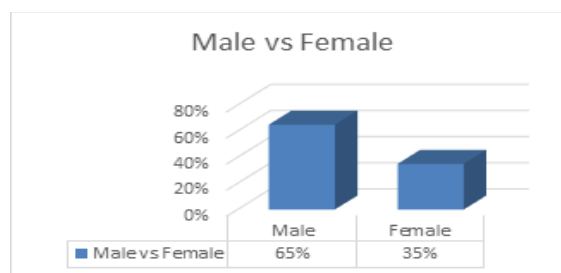


Figure 2: Male vs Female ratio

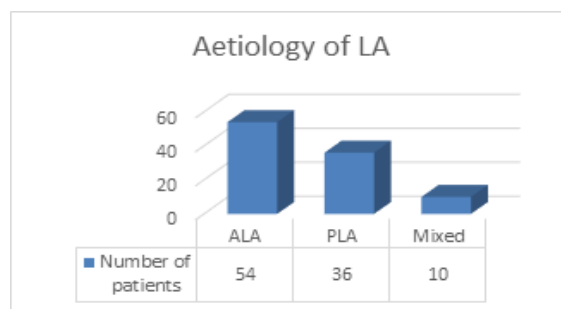


Figure 3: Etiology of liver abscess.

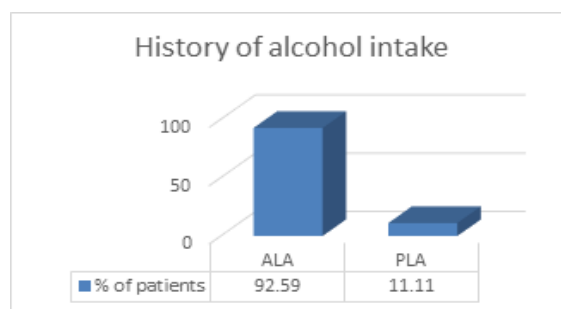


Figure 4: History of Alcohol intake of liver abscess patients.

In the present study, out of all the 100 patients, most 58(58%) were in the age group 40-60 years, 23 patients were of the age group 20-40 years and 19 patients were of the age group 60-80 years respectively. [Table 1]
65% of the patients were males and 35% of the patients were females respectively. Male and female ratio was 13:7. [Table 2]

A majority of patients 54(54%) had ALA, 36(36%) of the patients had PLA and 10(10%) of the patients had mixed infections respectively. [Table 3]
Out of total ALA patients, 50(92.59%) patients were alcoholic and out of total PLA patients, only 4(11.11%) patients were alcoholic. [Table 4]
In this present study, most of the case 98(98%) had abdominal pain followed by 60(60%) fever, 55(55%) abdominal distension and 19(19%) dysentery.

Table 1: Clinical symptoms of liver abscess patients

Clinical Symptoms	No. of patients	% of patients
Abdominal pain	98	98%
Fever	60	60%
Abdominal distension	55	55%
Dysentery	19	19%

Most of the patients had tenderness of the right hypochondrium and intercostal(ICS)region 98(98%) followed by hepatomegaly 52(52%), jaundice 26(26%) and epigastric mass 13(13%) respectively.

Table 2: Clinical Signs of Liver Abscess patients

Clinical Signs	No. of patients	% of patients
Right upper quadrant and ICS tenderness	98	98%
Hepatomegaly	52	52%
Jaundice	26	26%
Epigastric mass	13	13%

Most of the patients 74(74%) had abscess in the right lobe. 12(12%) patients had abscess in the left lobe. Multiple abscess/both lobe abscess was seen in 10(10%) patients. Caudate lobe abscess was seen in 4(4%) cases. Ruptured abscess was seen in 13(13%) patients.

Table 3: Lobe Involvement and Number of abscess

Presentation	No. of Patients	% of Patients
Right Lobe	74	74%
Left Lobe	12	12%
Both Lobes/ multiple	10	10%
Caudate Lobe	04	04%
Ruptured Abscess	13	13%

Single aspiration was performed in 37(37%) patients, percutaneous catheter drainage was done in 26(26%) patients, laparotomy and drainage was done in 20(20%) patients, multiple aspirations were performed in 13(13%) patients and in 4(4%) patients, conservative management was done.

Table 4: Mode of treatment of liver abscess

Treatment	No. of patients	% of patients
Single aspiration	37	37%
Percutaneous catheter drainage	26	26%
Laparotomy and drainage	20	20%
Multiple aspirations	13	13%
Conservative Management	4	4%

DISCUSSION

A liver abscess is a suppurative cavity in the liver resulting from the invasion and multiplication of microorganisms, entering directly from an injury through the blood vessels or by the way of the biliary ductal system. Liver abscesses are most commonly due to pyogenic, amoebic or mixed infections. Less commonly these may be fungal in origin.^[9]

In the present study, a total of 100 patients diagnosed of liver abscess at our centre were enrolled. Most of the patients 58(58%) were in age group 41 to 60 years

of age. Majorities of liver abscess patients (65%) were males. Male and female ratio was 13:7.

Abdullah A A et al in their study on amoebic liver abscess have found that amoebic liver abscess is more common in the age group of 20-45 years and this finding differs from our study.^[10]

The most commonly reported signs and symptoms included fever, abdominal pain and hypotension.^[11,12] The percentage of patients affected by each symptom encompasses a fairly wide range, which reflects the high degree variability in clinical findings. The difficulty in making the diagnosis is also reflected in the reported delay in

time of onset of symptoms to time of diagnosis, which on average is one week.^[13] Laboratory findings in patients with LA are also relatively nonspecific. The most common abnormalities are elevated white blood cell count (WBC), elevated C-reactive protein, hypoalbuminemia, elevated aspartate aminotransferase (AST), elevated alanine aminotransferase (ALT), elevated alkaline phosphatase (ALP), elevated gamma glutamyl transpeptidase (GGT), elevated bilirubin, and elevated international normalized ratio (INR).^[13] While laboratory testing alone is not diagnostic, laboratory abnormalities usually prompt imaging studies that do lead to the diagnosis. Diagnosis of LA is made by imaging in 90% of the cases.^[11] Imaging can also help identify the underlying cause in some cases. The primary methods of diagnostic imaging are conventional ultrasound (USG) and CECT abdomen. Both methods carry a sensitivity of 96%–100% for detection of LA.^[14] Lin et al. found that 25% of patients had equivocal results in the emergency department and 14% had a false negative results on USG.^[15] LA are typically hypo-echoic on USG and may have varying degrees of internal echogenicity depending on the presence of septations or gas.^[14]

In this present study, 50(92.59%) of amoebic and only 4(11.11%) pyogenic liver abscess patients were alcoholic. Most of the cases had abdominal pain 98(98%) followed by fever 60(60%), abdominal distension 55(55%) and dysentery 19(19%). Most of the patients had tenderness in the right hypochondrium and intercostal region 98(98%) followed by hepatomegaly 52(52%), jaundice 26(26%) and epigastric mass 13 (13%).

Sharma N et al noted history of alcohol consumption in (46.5%) of patients and Seeto R K et al noted it in (84%) of patients in their studies respectively. Alcohol being an immunosuppressant impairs Kupffer cell function and suppresses cell mediated and humoral immunity against *Entamoeba histolytica*.^[16,17]

The most important and accurate diagnostic tool in our study was USG abdomen which had accuracy of 96%. CECT abdomen was performed in some cases due to diagnostic dilemma.

In the present study, most of the patients had abscess in the right lobe 74(74%). Ruptured abscess were seen in 13(13%) patients. Left lobe liver abscess were seen in 12(12%) patients. Multiple abscesses/both lobe abscesses were seen in 10(10%) patients. Caudate lobe abscess was seen in only 4(4%) patients. Amoebic infection 54(54%) was the most common etiology of liver abscess, pyogenic infection was seen 36(36%) patients whereas 10(10%) cases had a mixed infection.

The most commonly involved region of the liver in our study was the right lobe, which is in accordance with the findings observed by Khan R A et al, Kebede A et al, Sharma N et al and Qazi A R et al,^[10,16,18,19] in their studies. The reason why right lobe of the liver is more prone to develop abscess than the left lobe is

due to greater volume of blood going to right side than the left lobe.^[18] About 10% of patients presented with multiple abscesses and all of which were PLA in our study matching the observations made by Sharma N et al, Ahsan I et al, Alvarez JA et al and Goh K L et al,^[16,20,21] where multiple abscesses were predominantly pyogenic. Bukhari A J et al reported predominantly (83%) solitary abscess in their study, which was similar to our study. All the ruptured abscesses ruptured intra-peritoneally which was in concordance with the observations by Hayat A S et al.^[22]

In the present study, most of the patients were managed by any one of the following interventions depending upon the clinical scenario. USG guided single aspiration was performed in 37(37%) patients, USG guided percutaneous catheter drainage was done in 26(26%) patients, laparotomy and drainage was done in 20(20%) patients, USG guided serial aspirations were done in 13(13%) patients and 4(4%) patients were treated conservatively.

Zerem E et al reported needle aspiration (either single or multiple) was successful in 67% of patients and percutaneous drainage was successful in 100% of patients.^[19]

In our study, 1(1%) patient aged 75 years who underwent laparotomy and drainage for ruptured amoebic liver abscess died on post operative day 3 due to multi-system organ failure and hence mortality rate in our study was 1(1%).

CONCLUSION

From the present study we conclude that in the Kumaun area of Uttarakhand, liver abscess is commonly seen in the middle age groups with a male preponderance. The commonest etiology is ALA. Amoebic liver abscess is commonly seen in alcoholic patients. Abdominal pain, fever and abdominal distension are the common clinical symptoms. Tenderness of the right hypochondrium and intercostal region and hepatomegaly are the common clinical signs of liver abscess. Right lobe of the liver is the commonest involved area of LA. Most of the patients can be managed by percutaneous USG guided single aspiration. If aspiration fails, percutaneous catheter drainage is a very effective modality for the management of LA. A very prompt recognition of symptoms and signs of LA is important in initiating effective management and achieving good outcomes. Because of the nonspecific symptoms and laboratory findings, the presence of predisposing factors can be helpful in increasing the level of diagnostic suspicion. Hence, the key to successful outcome in the management of liver abscess is early diagnosis and appropriate therapy.

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