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Original Research Article

Our experiences with liver abscesses in hospitals attached to Bangalore Medical College and Research Institute, India

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ABSTRACT

Background: Liver abscess is a common problem in India and is associated with high morbidity and mortality. Broadly they can be divided into two types- Pyogenic and Amoebic. Amoebic in particular has a very high burden on society in India, believed to be secondary to poor sanitation and hygiene in the population.
Methods: We performed a prospective, descriptive case series assessing demographic characteristics, presentation patterns, etiological factors, microbiological etiology, and management for patients treated for liver abscess at our centres between 2016 and 2018. 70 patients were identified and diagnosed on the basis of ultrasound and gram staining and culture of the pus aspirate.
Results: Amoebic liver abscess was in majority (75%), with males being more affected than females (90%). Alcoholic and diabetic males between 30 and 50 years of age were most affected. Most presented with abdominal pain (96%). 53% needed Pigtail catheter drainage. Average duration of stay was 8 days, and 72% of the total patients showed relief of symptoms within 3 days.
Conclusions: Most cases were found to be due to amoebic etiology rather than pyogenic. Both amoebic and pyogenic abscesses are noted to be more common in young men between the ages of 20 - 50, with a higher incidence noted among the alcoholic and diabetic patients. Most patients present with Upper abdominal pain and ultrasound is a useful tool in diagnosing the condition and providing valuable information about the site and volume of the abscess. Majority of patients needed Ultrasound guided drainage of the abscess. Average hospital stay was 8 days.

Keywords: Amoebic abscess, Liver abscess, Pigtail catheter, Pyogenic abscess

INTRODUCTION

Historically, liver abscesses have been documented as far back as 3000 BC with the works of Bhrigu Samhita where patients often complaining of right upper quadrant pain with blood and mucus in stool tended to have a much higher rate of death.

Hippocrates (400 BC) described similar complaints in the greek population at the time and established drainage of liver abscess as a form of therapy. However, no serious attempt was made to study the disease till much later.[1]

Oschner and DeBakey in 1938 found that the disease occurred secondary to pylephlebitis due to intra-abdominal infections and was largely confined to 20-30-year olds as a result of acute appendicitis and advised open surgical drainage as a way to treat the disease. However, as a result of the high mortality rate associated with the surgery, open drainage did not gain widespread popularity.

After 1938, the prognosis of patients improved as use of Antibiotics and Drainage procedures gradually become the focus of treatment.[3] In 1953, McFadzean et al were

the first to describe closed aspiration for treatment of solitary pyogenic liver abscess, but that only gained popularity in the 1980s when the advent of Ultrasound and CT changed the landscape of liver abscess treatment completely, by making closed drainage and aspiration under radiological guidance a much safer modality.[4,3]

Over the last two decades, several studies have attempted to identify and utilize biochemical and radiological signs that would help us predict the outcome of the disease. A study done by Barakate et al on pyogenic liver abscesses found that the factors predicting failure of initial nonoperative management were unresolving jaundice, renal impairment secondary to clinical deterioration, multiloculated abscess, rupture on presentation and biliary communication.[5] Pitt HA et al found that the factors associated with a poor prognosis were age >70 years, multiple abscesses, malignancies, jaundice, hypoalbuminemia, polymorphonucleocytosis, bacteremia, and pulmonary, peritoneal, or other significant complication.[6]

A study done in Shenzhen General Hospital in 1994 reported that independent factors in predicting mortality were -Patient age (>60 years), BUN (>20 mg per dL), serum creatinine (>2 mg per dL), total bilirubin (>2 mg per dL), and albumin (<2.5 gm per dL).[7]

Similarly, Chuah SK et al concluded that indices such as jaundice, hemoglobin and serum bilirubin levels, and dyspnea, as well as pulmonary changes (right diaphragm elevation, right pleural effusion) had possible predictive value.[8] Several studies have also found an association between hyperbilirubinemia and Liver abscesses, with studies finding incidence of jaundice in patients with amoebic liver abscess is a frequent occurrence, the incidence varying between 6% and 29%.[9-13]

More recent studies done by Lin et al, has suggested a correlation between chronic proton pump inhibitor use and development of pyogenic liver abscess.[14] However the advancements in antibiotic therapy and advancements in radiology have caused a gradual shift in the epidemiology of the disease. Currently pyogenic abscesses are seen in the 50s-60s and are secondary to biliary tract changes, while Amoebic liver abscess spread by the feco-oral route when cysts are ingested and develop into the Trophozoites then spread by the portal blood to the liver.[3]

With the recent advancements in interventional radiology, USG guided procedures like percutaneous needle aspiration and pigtail insertion are becoming the mainstay of therapy, with a recent meta-analysis done by Cai et al, finding that pigtail catheter insertion is more effective than needle aspiration because it facilitates a higher success rate, reduces the time required to achieve clinical relief and supports a 50% reduction in abscess cavity size, particularly for abscess cavities of 400 ml and more.[15]

METHODS

Patients presenting with fever and right upper quadrant abdominal pain with ultrasound features suggestive of a liver abscess were included in this study.

Inclusion criteria

- Patients with pyogenic, amoebic, cryptogenic and post traumatic liver abscesses
- Patients 18 years and above
- Patients willing to give informed written consent

Exclusion criteria

- Patients less than 18 years of age
- Patients who are not willing to give informed written consent.

After obtaining clearance and approval from the BMCRI ethics committee, patients fulfilling the inclusion/exclusion criteria, after obtaining the informed written consent were included in the study. Data was collected in a standard study proforma in the form of a questionnaire and data recording sheet.

A preliminary ultrasound and investigation panel was done on admission to determine the characteristics of the abscess cavity and a decision was taken regarding one of three possible treatment modalities: Antibiotic therapy only, Antibiotic therapy with percutaneous aspiration and Open Surgical Intervention.

We try to find out etiology on the basis of clinical features, imaging by USG, Gram stain of aspirate from liver abscess, aspirate culture and blood culture. Patients with typical clinical features, USG finding along with aspirate staining positive considered to have pyogenic liver abscess which was further confirmed by aspirate culture, and blood culture.

Amoebic abscess was diagnosed by culture negative cases with characteristic anchovy sauce appearance on aspiration. Treatment modalities include medical management, and pig tail catheter drainage under ultrasound guidance. Open surgical method was reserved for patients presenting with features of peritonitis due to a ruptured liver abscess and with ultrasonographic evidence of the same.

Treatment was started on the basis of the above categorization and the patient will be followed up with review scans every 3 days to note the response to the therapy. Drugs used were Inj. Metronidazole 500 mg 8th Hourly and Inj. Ciprofloxacin 500 mg 12th hourly.

RESULTS

Present study found an overwhelming majority of amoebic liver abscess with 75% of the total being amoebic and 25% being pyogenic. This is the proven trend in developing countries, believed to be as a result of poor sanitation and overcrowding (Table 1).

Table 1: Type of abscess.

Type of abscess	Number
Amoebic	53
Pyogenic	17
Grand total	70

Age distribution

Both appeared to affect the 4th and 5th decade of life maximally. 62% of the total amoebic liver abscess patients fall in the range while the same for 47% of Pyogenic abscess patients. Pyogenic abscesses were also found to affect a relatively younger age group (Table 2).

Table 2: Age distribution.

Age	Amoebic	Pyogenic	Total
21 to 30	8	4	12
31 to 40	18	4	22
41 to 50	15	4	19
51 to 60	8	1	9
61 to 70	4	3	7
71 to 80	0	1	1
Total	53	17	70

Table 3: Gender distribution.

	Amoebic	Pyogenic	Total
Males	48	16	64
Females	5	1	6
Total	53	17	70

90% of the total number of patients were male, while only 10% of the total were females. Both types demonstrated a ratio of almost 10:1 in Favour of male patients (Table 3).

Table 4: Alcoholic and abscess type.

Alcoholic	Amoebic	Pyogenic	Grand total
No	19	4	23
Yes	34	13	47
Grand total	53	17	70

Alcoholism appeared to be a risk factor for both types of abscesses with almost 64% (n = 34) of the patients with Amoebic and 76% (n = 13) of the total number of patients with Pyogenic abscesses noted to have been alcoholic (Table 4), while the present study noted a lesser significance of Diabetes, with only 13% of amoebic (n= 7) were found to be diabetic and 41% of pyogenic (n=7) being diabetic (Table 5).

Table 5: Diabetes and abscess type.

Diabetes	Amoebic	Pyogenic	Grand total
Absent	46	10	56
Present	7	7	14
Grand total	53	17	70

Table 6: Clinical features on presentation.

Presentation	Number (%)
Abdominal pain	67 (96)
Fever	60 (85)
Chills and rigors	48 (67)
Nausea and vomiting	41 (58)
Intercostal tenderness	23 (33)
Hepatomegaly	39 (55)
Icterus	12 (17)

Clinical features

The most common presentation was found to be abdominal pain, with 96% of the total number of patients reporting that as their presenting symptom. Intercostal tenderness was found in most cases of Pyogenic Liver Abscess. On clinical examination, 55% of the total cases were found to have hepatomegaly, and only 17% were found to be demonstrably Icteric (Table 6).

Ultrasound findings

Most cases were found to have single abscess cavities (77%) with 23% having multiple abscess cavities (Table 7), with overall Right lobe being most frequently involved (75%) (Table 8).

Investigations

The most common abnormal lab value was found to be an elevated Leukocyte count with elevated ALP being the second most (Table 9). Present study found no patients to be HbsAg or HCV positive.

However, one patient presenting with features of peritonitis and ruptured liver abscess was found to be HIV positive and was associated with an overall worse prognosis and eventual death, accounting for the only mortality seen in the study.

Table 7: Number of abscesses.

Single/multiple	Amoebic	Pyogenic	Grand total
Multiple	5	11	16
Single	48	6	54
Grand total	53	17	70

Table 8: Right versus left lobe involvement.

Investigation	Normal range	Outliers
Haemoglobin	>11g/dl	28(40%)
TLC	4000-11000/cu mm^3	47(67%)
Total bilirubin	<1.2 g /dl	23(33%)
AST/ALT	< 50 IU/L for both	28(40%)
ALP	<300 IU/L	34(49%)
Albumin	<3.5 g/dl	30(43%)

Table 8: Right versus left lobe involvement.

Site	Number (percentage)
Right lobe	53 (76%)
Left lobe	6 (8%)
Both lobes	11 (16%)

Table 9: Investigations found to be deranged.

Investigation	Normal range	Outliers
Haemoglobin	>11g/dl	28 (40%)
TLC	4000-11000/cumm^3	47 (67%)
Total bilirubin	<1.2 g /dl	23(33%)
AST/ALT	< 50 IU/L for both	28 (40%)
ALP	<300 IU/L	34 (49%)
Albumin	<3.5 g/dl	30 (43%)

Average hospital stay was found to be 8 days and 72% of the total number patients reported a relief of symptoms within 3 days of institution of treatment.

Table 10: Treatment modalities.

Treatment	Number (%)
Conservative	13 (18%)
USG drainage	51 (73%)
Laparotomy	6 (9%)

Table 11: Time taken for symptomatic improvement.

Relief of symptoms	Amoebic	Pyogenic	Grand total
<3 days	39	7	46
>3 days	14	10	24
Grand total	53	17	70

Symptomatically amoebic liver abscess cases reported an overall quicker rate of recovery, with 75% of ALA patients reporting symptomatic improvement within 3 days of starting therapy, while 58% of pyogenic cases reported a delayed recovery time for symptoms (Table 11).

DISCUSSION

Present study found that the incidence of amoebic liver abscess was much more than pyogenic, and tends to involve the Right lobe preferentially, believed to be since the right portal vein receives blood from the Ascending colon and right colon, which is affected by amoebiasis preferentially.

The incidence is males as compared to females for both amoebic (9:1) and pyogenic (15:1)was found to be much more, as demonstrated by Kapoor et al, who found that the ratio of female:male patients in amoebic liver abscess was 6:1.The incidence is males is believed to be higher due to a greater incidence of amoebiasis in the same.[16]

Present study found that the 4th and 5th decade were more commonly affected, which is a departure from the usual incidence seen in the 3rd and 4th decade, which could be as a result of a shift noted in recent times wherein older patients are presenting with pyogenic abscesses believed to be secondary to a greater predisposition to anaerobic infections.[17]

Present study also found a higher association with alcoholism and diabetes. The incidence and severity of liver abscesses are believed to be more in patients who are diabetic, with one study quoting an incidence of almost 21% of all pyogenic liver abscess cases being diabetic.[17] In one study by Krige et al, diabetes mellitus was associated with PLA in about 15% of cases, while a study in Taiwan noted, the incidence of rupture to be higher in diabetic cases.[18,9]

A nationwide study doen in Denmark by Molle et al, noted that the incidence and short term outcome in alcoholics was significantly worse, noting a fourfold increase in mortality rate over 30 days between cirrhotics and non cirrhotics, believed to be due to the immunosuppressive effect of alcohol.[19] Studies by Makkar et al, theorize that the higher iron content seen in the liver of alcoholic patients may be a risk factor for amoebic abscess.[20]

The most common presentation was still found to be abdominal pain and tenderness on examination seen in 96% of the total number of cases. All patients could localize the pain the right upper quadrant or gave history of the pain starting there before becoming diffuse abdominal pain as in case of the 6 patients who presented with features of peritonitis following rupture of the same.

Ultrasound was found to be a sensitive and specific tool for the diagnosis and follow up of liver abscess patients, with the size of the abscess correlating with the need for intervention and is useful in the long term follow up of the patient and to check response to therapy.[21]

Present study found that most amoebic abscess present with a single cavity, usually involving the right lobe as explained above, while pyogenic tend to be multiple, as the ascending infection from the biliary tree is the theorized pathophysiology of the disease. 33% of our patients were found to have deranged LFT, with increased total bilirubin the most commonly seen

manifestation. It is theorized that an already diseased liver as seen after chronic alcoholism is more prone for Amoebic infection due to Increased Iron content in the liver.[20] Other proposed theories point to large abscesses compressing biliary radicles especially when the size of the abscess is large and thus causing obstructive jaundice.[14] Elevated Bilirubin at admission is also being investigated as one of the predictors of adverse outcome in liver abscesses.[9]

Majority of our patients (73%) required intervention by Ultrasound guided pigtail catheter insertion due to large abscess cavity(>5cm diameter) at admission or smaller abscesses not responding to antibiotic therapy.

Study by Khan et al, noted that abscess of size 5 cm or more required intervention, with the overall recovery rate better in those undergoing percutaneous drainage versus intermittent needle aspiration.[22]

The patients were started as per hospital protocol on Inj. Ciprofloxacin 500 mg q12 hourly and Inj. Metronidazole 500 mg 8th hourly till pus culture and sensitivity were available. Drain was removed after the output was nil for 3 successive days and was followed up with Ultrasound scanning on every 3rd day.

18% patients were treated conservatively by starting the patient on antibiotics as per the hospital protocol and monitoring response with Ultrasound scanning every 3 days to assess abscess cavity and noting clinical response

6 Patients (8.6%) needed an emergency laparotomy for suspected rupture of the abscess, with peritoneal lavage given and abdominal drains placed. Of all the patients only 1 mortality was noted belonging to the surgical intervention group. However, the patient was noted to have other complicating factors like HIV and uncontrolled diabetes mellitus. Intra operative findings were noted to be a gangrenous caecum and ileum, believed to be secondary to amoebic typhilitis.

Average hospital stay was found to be 8 days and 72% of the total number patients reported a relief of symptoms within 3 days of institution of treatment. Symptomatically amoebic liver abscess cases reported an overall quicker rate of recovery, with 75% of ALA patients reporting symptomatic improvement within 3 days of starting therapy, while 58% of pyogenic cases reported a delayed recovery time for symptoms.

CONCLUSION

Most cases were found to be due to amoebic etiology rather than pyogenic. Both amoebic and pyogenic abscesses are noted to be more common in young men between the ages of 20-50, with a higher incidence noted among the alcoholic and diabetic patients. Most patients present with Upper abdominal pain and ultrasound is a useful tool in diagnosing the condition and providing valuable information about the site and volume of the abscess. Majority of patients needed Ultrasound guided drainage of the abscess. Average hospital stay was 8 days.

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REFERENCES

1. Adams F. The Genuine Works of Hippocrates. Aphorisms. New York, W. Wood and company; 1886:1796-1861.
2. Ochsner A, DeBakey M, Murray S. Pyogenic abscess of the liver: II. An analysis of forty-seven cases with review of the literature. Am J Surg. 1938;40(1):292-319.
3. Townsend CM, Sabiston DC. Sabiston textbook of surgery: the biological basis of modern surgical practice. Philadelphia: Saunders; 2004;53:1471.
4. McFadzean AJS, Chang KPS, Wong CC. Solitary pyogenic abscess of liver treated by closed aspiration and antibiotics: A report of 14 consecutive cases and recovery. Br J Surg. 1953;41:141-52.
5. Barakate MS, Stephen MS, Waugh RC, Gallagher PJ, Solomon MJ, Storey DW, et al. Pyogenic liver abscess: a review of 10 years' experience in management. ANZ J Surg. 1999;69(3):205-9.
6. Huang CJ, Pitt HA, Lipsett PA, Osterman FA, Lillemoe KD, Cameron JL, et al. Pyogenic hepatic abscess. Ann Surg. 1996;223(5):600-9.
7. Chou FF, Sheen-Chen SM, Chen YS, Chen MC, Chen FC, Tai DI. Prognostic factors for pyogenic abscess of the liver. J Am Coll Surg. 1994;179(6):727-32.
8. Chuah SK, Chang-Chien CS, Sheen IS, Lin HH, Chiou SS, Chiu CT, et al. The prognostic factors of severe amoebic liver abscess: a retrospective study of 125 cases. Am J Trop Med Hyg. 1994;46(4).
9. Singh V, Bhalla A, Sharma N, Mahi SK, Lal A. Pathophysiology of jaundice in amoebic liver abscess. Am J Trop Med Hyg. 2008;78:556-9.
10. Nigam P, Gupta AK, Kapoor KK, Sharan GR, Goyal BM. Cholestasis in amoebic liver abscess. Gut. 1985;26:140-5.
11. Hughes MA, Petri WA Jr. Amebic liver abscess. Infect Dis Clin North Am. 2000;14:565-82.
12. Gupta RK, Pant CS. Ultrasound demonstration of amoebic liver abscess causing obstructive jaundice. Australas Radiol. 1986;30:329-31.
13. Sarda AK, Kannan R, Gupta A, Mahajan V, Jain PK. Amebic liver abscess with jaundice. Surg Today. 1998;28:305-7.
14. Lin HF, Liao KF, Chang CM, Lin CL, Lai SW. Correlation between proton pump inhibitors and risk of pyogenic liver abscess. Eu J Clin Pharmacol. 2017;73(8):1019-25.

15. Cai YL, Xiong XZ, Lu J, Cheng Y, Yang C, Lin YX, et al. Percutaneous needle aspiration versus catheter drainage in the management of liver abscess: a systematic review and meta-analysis. HPB. 2015;17(3):195-201.
16. Kapoor OP. Amoebic Liver Abscess. S S Publisher; 1979:205.
17. Mathur S, Gehlot RS, Motha A, Bhargava N, Clinical profile of amoebic liver abscess. JIACM. 2002;3(4):367-73.
18. Krige JEJ, Beckingham IJ. ABC of disease of liver, pancreas, biliary system liver abscess and hydatid disease. BMJ. 2001;322:537-40.
19. Molle I. Increased risk and case fatality rate of pyogenic liver abscess in patients with liver cirrhosis: a nationwide study in Denmark. Gut. 2001;48(2):260-3.
20. Makkar RP, Sachdev GK, Malhotra V. Alcohol consumption, hepatic iron load and the risk of amoebic liver abscess: a case-control study. Internal Med. 2003;42(8):644-9.
21. Mukhopadhyay M, Saha AK, Sarkar A, Mukherjee S. Amoebic liver abscess: presentation and complications. Indian J Surg. 2010;72(1):37-41.
22. Khan A, Tekam VK. Liver abscess drainage by needle aspiration versus pigtail catheter: a prospective study. Int Surg J. 2018;5:62-8.

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