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PROSPECTIVE OBSERVATIONAL STUDY FOR THE MANAGEMENT OF AMOEBIC LIVER ABSCESS

General Surgery

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ABSTRACT

Introduction: Amoebic liver abscess (ALA) is a potentially life-threatening condition caused by Entamoeba histolytica. While clinical symptoms like fever and abdominal pain are common to both ALA and pyogenic liver abscess (PLA), diagnosis and management strategies differ. ALA continues to be a significant health burden, particularly in developing regions where sanitation is poor and healthcare access is limited. **Aim & Objective:** To study the management of amoebic liver abscess, assess treatment outcomes, and identify common complications associated with different therapeutic strategies. **Methodology:** A prospective observational study was conducted in the Department of General Surgery at SGT Medical College, Gurugram, over 18 months. Eighty patients diagnosed with ALA were included. Based on abscess size, patients were categorized and managed with oral/intravenous metronidazole, ultrasound-guided aspiration, or pigtail catheter drainage. Clinical, laboratory, and radiological data were collected, and follow-up was done over three months. **Result:** Most participants were aged 21–40 years (55%) and predominantly male (72.5%). Mean hospital stay was 14.22 days, and ICU stay averaged 4.62 days. Sepsis (81.3%), peritonitis (61.3%), and pleural effusion (58.8%) were the most common complications. **Conclusion:** ALA primarily affects young males and carries a high risk of severe complications. Timely diagnosis and stratified treatment significantly improve clinical outcomes.

KEYWORDS

Amoebic Liver Abscess, Entamoeba Histolytica, Liver Abscess Management, Metronidazole Therapy, Pigtail Catheter Drainage, Ultrasound-guided Aspiration, Complications, Sepsis, ICU Stay, Prospective Observational Study.

INTRODUCTION

A liver abscess is a pus-filled cavity within the liver that may result from liver damage or infections spreading through the portal vein. Although some are caused by parasites and fungi, most are either pyogenic or amoebic in origin.[1,2] Amoebic liver abscess (ALA) and pyogenic liver abscess (PLA) differ in their causes. ALA is primarily caused by Entamoeba histolytica, which induces liver cell apoptosis, while PLA involves direct infection and inflammation of liver tissue. Biliary tract disease is a major underlying cause of PLA. The incidence of liver abscess is increasing, especially among individuals who are alcoholic, diabetic, or immunocompromised.[3] While E. histolytica is the main cause of amoebic infections, most liver abscesses are polymicrobial in nature. Common organisms in PLA include E. coli, Klebsiella, Streptococcus, Staphylococcus, and anaerobes.

Though relatively uncommon, liver abscesses are clinically significant due to their high mortality in untreated cases.[4] The annual incidence is approximately 2.3 per 100,000 people, with men affected more often than women. The likelihood of developing a liver abscess, particularly non-traumatic ones, increases with age, especially between 40 and 60 years. Pyogenic abscesses are more commonly diagnosed among all types.[5]

Both ALA and PLA present with similar symptoms, including fever and right upper abdominal tenderness. In ALA, the clinical course is often benign unless poor prognostic features are present. Laboratory parameters like leukocytosis (mainly neutrophilic), elevated inflammatory markers such as C-reactive protein, increased alkaline phosphatase, and abnormal liver function tests are seen in both conditions but do not help differentiate between them.

Imaging techniques like ultrasonography and CT scan are essential for diagnosing liver abscesses, though they may not always clearly distinguish ALA from PLA.[6] ALA typically appears as a single lesion in the right hepatic lobe, although left lobe or multiple lesions can occur. CT scan, though less accessible in low-middle-income countries (LMICs), has a higher sensitivity (97%) than ultrasound (85%) in identifying liver abscesses.[7]

Radiologically and clinically, ALA and PLA can resemble each other. Traditionally, aspiration of an amoebic abscess yields a characteristic "anchovy sauce" appearance. Trophozoites are rarely found in the aspirate. In highly endemic areas, serological tests for E. histolytica have limited value, but they may help in diagnosing visitors from non-endemic regions. Molecular and antigen detection methods, if available, can be useful.[8] Noninvasive tests like polymerase chain reaction (PCR) are increasingly used to detect E. histolytica DNA in fluids such as blood, pus, saliva, and urine. Rapid lateral flow assays using blood markers also show promise for quick, noninvasive ALA diagnosis.[9–10]

Recognizing uncommon forms of ALA is important because they are often associated with complications. These may be local, such as rupture, pleural effusion, compression, or vascular thrombosis, or systemic, including systemic inflammatory response syndrome, shock, encephalopathy, and acute kidney injury.[11] Early diagnosis is essential as symptoms like fever, abdominal pain, nausea, and vomiting can be vague. A high index of suspicion improves prognosis. Recent advances in treatment, such as combined antibiotics and percutaneous drainage, have significantly reduced mortality rates from 70% to 6.31%.[12]

In LMICs, empiric antimicrobial therapy is often started before laboratory confirmation, targeting both amoebic and pyogenic causes. This makes it difficult to identify the exact pathogen or determine the relative prevalence of ALA and PLA. Lack of local microbiological data hampers the development of appropriate antibiotic guidelines, which are often adapted from other regions rather than based on local evidence.

Management of ALA includes medical treatment, radiologic drainage, and surgery. Mixed infections and PLA generally require both drainage—either repeated needle aspiration or percutaneous catheter drainage—and suitable antibiotics, whereas ALA is usually managed medically. Surgical drainage is now reserved for complicated cases as minimally invasive methods have become standard.[13] Over time, PLA management has evolved from open surgery to image-guided percutaneous drainage. The decision to drain or not depends on abscess size; abscesses smaller than 3 cm are often managed conservatively. Aspiration alone is successful in many cases and can lead to resolution.[14]

ALA remains a significant public health issue, particularly in areas

with poor sanitation and limited healthcare access. Delayed diagnosis and variations in management strategies contribute to its persistence, despite improvements in diagnosis and therapy. Understanding the clinical patterns, treatment approaches, and outcomes is crucial for improving patient care. This prospective observational study aims to evaluate current treatment strategies, including medical therapy and surgical interventions, and assess their effectiveness in managing ALA.

AIMS AND OBJECTIVES

- To study the Management of Amoebic Liver Abscess.

MATERIAL AND METHODS

The present study will be conducted in the Department of General Surgery at SGT Medical College, SGT University, Budhera, Gurugram, Haryana, over a period of 18 months. It is designed as a prospective observational study aimed at evaluating the outcomes of different treatment strategies in patients diagnosed with amoebic liver abscess. All patients admitted to the general surgery department with a clinical diagnosis of amoebic liver abscess will be included as the data source. A sequential and convenient hospital-based sampling technique will be employed, and a minimum of 80 patients with confirmed clinical diagnoses will be included. The inclusion criterion for the study is patients showing clinical and radiological evidence of amoebic liver abscess on ultrasonography, CT scan, or both. Exclusion criteria include patients below 18 years of age, pregnant women, cases of malignancy, ruptured liver abscess, pyogenic liver abscess, and multiple liver abscesses.

Ethical clearance for the study will be obtained from the Institutional Ethics Committee, and written informed consent will be collected from all participants in their native language to ensure clarity and understanding. Data collection will involve patients from both the outpatient and emergency departments of general surgery. A detailed clinical history and examination will be followed by investigations including hepatitis B surface antigen, hepatitis C virus, HIV, PT-INR, ultrasonography, chest X-ray (posteroanterior view), ECG, platelet count, total and differential leukocyte count, blood sugar, liver function test, serum creatinine, and blood urea.

Based on clinical evaluation and imaging findings, patients will be classified into three categories. In Category I, patients with liver abscesses smaller than 5 cm in the liquefaction stage will be treated with oral metronidazole at a dose of 40 mg/kg body weight in three divided doses. If signs of toxemia are present, they will initially receive intravenous metronidazole 100 ml every 8 hours for 3 to 4 days, followed by oral metronidazole. Patients responding within 48 hours will continue a 10-day treatment course. In Category II, patients with abscesses measuring 5–8 cm will first receive a 24-hour trial of conservative treatment with IV metronidazole. If no clinical improvement is noted, they will undergo ultrasound-guided needle aspiration. In Category III, patients with abscesses larger than 8 cm will be directly treated with ultrasound-guided pigtail catheter drainage. The pus collected will be sent for culture, sensitivity, and trophozoite detection. The catheter will be removed once the drainage is less than 10 ml in 24 hours for two consecutive days.

For each patient, the time taken for abscess resolution and median hospital stay will be recorded. Any complications such as port site infection, failure of abscess resolution, hemorrhage, pleural complications, persistent fever, and mortality will be documented. The study aims to assess whether structured planning and diligent care can minimize these complications. Patients will be followed up weekly for one month and then monthly for the next three months to monitor recovery and long-term outcomes.

RESULT

Table 1: Distribution of Study Participants According to Age Group:

Age group	Frequency	Percent
<20 years	9	11.3
21-40 years	44	55.0
41-60 years	19	23.8
>60 years	8	10.0
Total	80	100.0

More than half of the participants (55.0%) were between 21–40 years. Participants <20 years comprised 11.3%, those aged 41–60 years made up 23.8%, and >60 years accounted for 10.0%.

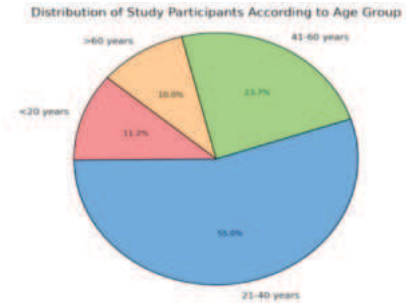


Table 2: Distribution of Study Participants According to Gender:

Gender	Frequency	Percent
Female	22	27.5
Male	58	72.5
Total	80	100.0

Out of 80 participants, 58 (72.5%) were male and 22 (27.5%) were female, showing a clear male predominance.

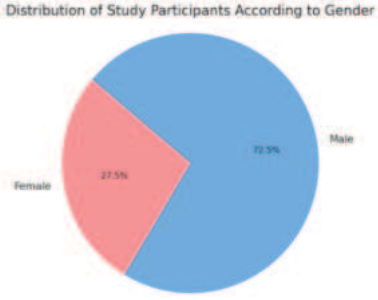


Table 3: Length of Hospital Stay (in Days) Distribution of Study Participants

Mean	14.220
Median	14.000
Std. Deviation	4.1418
Minimum	8.0
Maximum	28.0

The mean hospital stay was 14.22 days, ranging from 8 to 28 days. The median stay was 14 days with a standard deviation of 4.14 days.

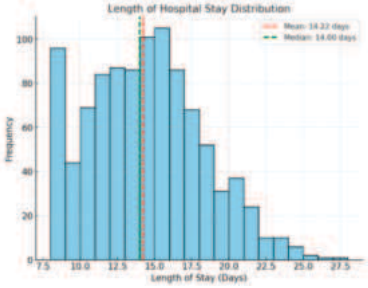


Table 4: Length of ICU Stay (in Days) Distribution of Study Participants

Mean	4.620
Median	7.000
Std. Deviation	4.4533
Minimum	.0
Maximum	14.0

The mean ICU stay was 4.62 days, ranging from 0 to 14 days, with a median of 7 days and a standard deviation of 4.45 days.

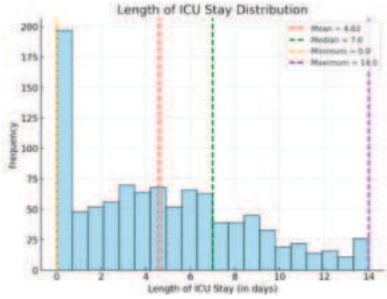
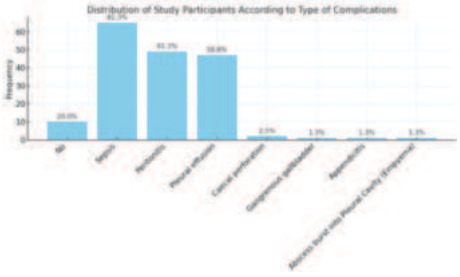


Table 5: Distribution of Study Participants According to Type of Complications

Complications	Frequency	Percent
No	10	20.0
Sepsis	65	81.3
Peritonitis	49	61.3
Pleural effusion	47	58.8
Caecal perforation	2	2.5
Gangrenous gallbladder	1	1.3
Appendicitis	1	1.3
Abscess burst into Pleural Cavity (Empyema)	1	1.3

Sepsis was the most common complication (81.3%), followed by peritonitis (61.3%) and pleural effusion (58.8%). Rare complications included caecal perforation, gangrenous gallbladder, appendicitis, and empyema (1.3% each).



DISCUSSION

The present study aimed to evaluate the management outcomes of Amoebic Liver Abscess (ALA) and revealed significant demographic and clinical patterns, which can be compared with existing literature for broader clinical relevance.

In the current study, the majority of patients (55.0%) belonged to the 21–40 years age group, with a mean age of 40.24 years. This aligns with findings by Kevin B et al.,[17] who observed that liver abscesses often present in younger to middle-aged adults, although PLA was more prominent in their cohort. Similarly, Meister P et al.[19] also noted that a substantial number of PLA cases occurred in younger adults, particularly those with underlying risk factors. The predominance of middle age suggests the need for heightened clinical vigilance in this age group, particularly in endemic regions.

Gender distribution in our study showed a strong male predominance (72.5%), which is consistent with several prior studies. Cai YL et al.[15] also reported a higher male incidence, although their primary focus was on treatment efficacy. The gender skew could be linked to behavioral and occupational exposure, or differences in immune response, which merits further exploration in the context of amoebiasis.

Hospital stay duration in our study averaged 14.22 days, with a wide range of 8–28 days. This is in agreement with Cai YL et al.,[15] who found no significant difference in hospital stay between patients treated with percutaneous catheter drainage (PCD) versus percutaneous needle aspiration (PNA), reporting a mean difference of -0.17 days ($p = 0.86$). Meister P et al.[19] noted an average hospital stay that varied depending on treatment modality, with surgical intervention often prolonging hospitalization. This suggests that our findings fall within the expected range across both amoebic and pyogenic etiologies, especially when invasive interventions are required.

The average ICU stay observed in our study was 4.62 days, with surgically managed patients requiring longer stays. Although the ICU duration has not been explicitly quantified in the comparative studies, Meister P et al.[19] highlighted that surgical cases tend to have higher in-hospital mortality and complications, indirectly suggesting prolonged intensive care.

Complications were common in our study, with sepsis observed in 81.3% of patients, followed by peritonitis (61.3%) and pleural effusion (58.8%). These findings are comparable to those reported by Große K et al.,[16] who found higher mortality and complication rates in enterococcal PLA cases, emphasizing the seriousness of sepsis and the need for robust clinical monitoring. Meister P et al.[19] also observed that complications were common, and failure of antibiotic therapy alone occurred in 82% of their cases, necessitating drainage or surgery. These figures reinforce the need for a proactive interventional approach, especially in patients who do not show early clinical improvement.

Moreover, the management strategies in our cohort support existing literature. Surgical management was required in 52.5% of cases, particularly among those with larger abscesses or complications. Cai YL et al.[15] demonstrated that PCD had better clinical outcomes than PNA in terms of abscess resolution, although the safety and efficacy of both methods were comparable. Losie et al.[18] affirmed that PCD was successful in 70% of cases, and surgery was mainly reserved for refractory cases. These findings are echoed in our study, where conservative treatment was insufficient in a significant proportion, necessitating escalation to surgical drainage.

CONCLUSION

The present study highlights several key observations regarding the management and clinical profile of patients with amoebic liver abscess. A significant proportion of the affected individuals were young to middle-aged adults, with 55% belonging to the 21–40 years age group. There was a marked male predominance, as 72.5% of the study participants were male, suggesting that gender may play a role in susceptibility or exposure. The average duration of hospital stay was 14.22 days, ranging from 8 to 28 days, indicating a variable clinical course depending on severity and treatment response. The mean ICU stay was 4.62 days, with a median of 7 days, reflecting that a considerable number of patients required intensive monitoring and care. Complications were common and clinically significant, with sepsis being the most prevalent, observed in 81.3% of patients. This was followed by peritonitis in 61.3% and pleural effusion in 58.8% of the cases. Rare but serious complications such as caecal perforation, gangrenous gallbladder, appendicitis, and empyema were reported in 1.3% of cases each, underscoring the potential for diverse and severe outcomes in untreated or complicated cases. These findings reinforce the importance of early diagnosis and timely, appropriate management to reduce morbidity and improve prognosis in patients with amoebic liver abscess.

REFERENCES

1. Longworth S, Han J. Pyogenic liver abscess. Clin Liver Dis (Hoboken). 2015 24;6(2):51-54.
2. Lardière-Deguelte S, Ragot E, Amroun K, Piardi T, Dokmak S, Bruno O, Appere F, Sibert A, Hoeffel C, Sommacale D, Kianmanesh R. Hepatic abscess: Diagnosis and management. J Visc Surg. 2015;152(4):231-43.
3. Sharara AI, Rockey DC. Pyogenic Liver Abscess. Curr Treat Options Gastroenterol. 2002;5(6):437-442.
4. Huang CJ, Pitt HA, Lipsett PA, Osterman FA Jr, Lillemoe KD, Cameron JL, Zuidema GD. Pyogenic hepatic abscess. Changing trends over 42 years. Ann Surg. 1996;223(5):600-7.
5. Mavilia MG, Molina M, Wu GY. The Evolving Nature of Hepatic Abscess: A Review. J Clin Transl Hepatol. 2016;4(2):158-68.
6. Pitt HA, Zuidema GD. Factors influencing mortality in the treatment of pyogenic hepatic abscess. Surg Gynecol Obstet. 1975;140(2):228-34.
7. Kinney TD, Ferrebee JW. Hepatic abscess; factors determining its localization. Arch Pathol (Chic). 1948;45(1):41-7.
8. Krogstad DJ, Spencer HC Jr, Healy GR, Gleason NN, Sexton DJ, Herron CA. Amebiasis: epidemiologic studies in the United States, 1971-1974. Ann Intern Med. 1978;88(1):89-97.
9. Sabbaj J, Sutter VL, Finegold SM. Anaerobic pyogenic liver abscess. Ann Intern Med. 1972;77(4):627-38.
10. Satiani B, Davidson ED. Hepatic abscesses: improvement in mortality with early diagnosis and treatment. Am J Surg. 1978;135(5):647-50.
11. Barreda R, Ros PR. Diagnostic imaging of liver abscess. Crit Rev Diagn Imaging. 1992;33(1-2):29-58.
12. Gerzof SG, Johnson WC, Robbins AH, Nabseth DC. Intrahepatic pyogenic abscesses: treatment by percutaneous drainage. Am J Surg. 1985;149(4):487-94.
13. Bertel CK, van Heerden JA, Sheedy PF 2nd. Treatment of pyogenic hepatic abscesses. Surgical vs percutaneous drainage. Arch Surg. 1986;121(5):554-8.
14. Wong KP. Percutaneous drainage of pyogenic liver abscesses. World J Surg. 1990;14(4):492-7.
15. Cai YL, Xiong XZ, Lu J, Cheng Y, Yang C, Lin YX, Zhang J, Cheng NS. Percutaneous needle aspiration versus catheter drainage in the management of liver abscess: a systematic review and meta-analysis. HPB (Oxford). 2015 Mar;17(3):195-201.
16. Große, K., Ohm, D., Würstle, S. et al. Clinical characteristics and outcome of patients with enterococcal liver abscess. Sci Rep 11, 22265 (2021).
17. Kevin B; Baliss, Michelle DO; Tran, Minh N. MD; Sonstein, Lindsay MD. Pyogenic Liver Abscess Presenting as Obstructive Jaundice From Klebsiella Pneumoniae in Texas. The American Journal of Gastroenterology: October 2021 - Volume 116 - Issue - p S1181 S2843
18. Losie, J.A., Lam, J.C., Gregson, D.B. et al. Epidemiology and risk factors for pyogenic liver abscess in the Calgary Health Zone revisited: a population-based study. BMC Infect Dis 21, 939 (2021).
19. Meister, P., Irmer, H., Paul, A. et al. Therapy of pyogenic liver abscess with a primarily unknown cause. Langenbecks Arch Surg (2022). https://doi.org/10.1007/s00423-022-02535-3