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Case Series

Clinical insights into liver abscess: a comprehensive analysis of presentation, etiology and management in Northeastern India, Silchar, Assam

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ABSTRACT

Hepatic abscess is a prevalent disease in Northeastern India with a myriad clinical feature. The present study is aimed to understand the clinical profile, microbiological aetiologies, and management outcomes in patients with hepatic abscesses in Northeastern India, Silchar. In the surgery department of Silchar medical college and hospital, 20 cases of hepatic abscess were studied from January 2022 to October 2023. Records were kept for history, examination, and laboratory investigations. Ultrasound-guided aspiration of the abscess was done, and samples were subject to relevant investigation. The mean age of patients was 33 years, 2/3rd of the patients were from lower socioeconomic status. Alcoholic history was elicited from 45% of the patients. The abscesses were predominantly in the right lobe (70%) and solitary (65%). Etiology of the cases, 55% amoebic, 40% pyogenic, and 5% were tubercular in origin. Pigtail catheterization was done in 70% of the patients; percutaneous needle aspiration was done in 25% of the cases. No cases of mortality were noted. Amoebic and tubercular abscess were solitary in nature whereas pyogenic abscesses were multiple. The amoebic and pyogenic abscess had right lobe predominantly affected whereas in tubercular abscesses left lobe involvement was more common. The most common presentation was young male of low socioeconomic status having solitary amoebic abscess usually in the right lobe of liver

Keywords: Hepatic abscess, *Entamoeba histolytica*, Pig tail catheterization

INTRODUCTION

Hepatic abscess can be described as a suppurated cavity within healthy or diseases liver parenchyma caused by invasion and multiplication of microorganisms.[1] Microbes access the via way of bile ducts, blood stream (hematogenic, usually portal), or by contiguous spread, particularly through the gallbladder. Bacterial, parasitic (Amoebic), mixed (parasitic abscess with pyogenic superinfection) and infrequently fungal or tubercular are the possible etiologies of hepatic abscesses. In Southeast Asia, amoebic contamination is the most frequent cause. In western countries, 80 percent of hepatic abscess are bactericidal whereas in Indian conditions main etiological cause is amoebic in nature. The study at hand aims to explore the etiological profile of patients diagnosed with hepatic abscess in Silchar medical college and hospital. Silchar is the second largest city of North-eastern region. It is the main access point for neighbouring states of Manipur, Mizoram, Tripura and Meghalaya. The Silchar medical college caters to a population that is almost a representative sample of Northeast.[2] Hence the findings of the study can be extrapolated to the entire population.

This is the first study of the nature to study hepatic abscess with this specific population in mind. Hepatic abscess usually occurs in the course of Intra-abdominal biliary infection causing contamination of the biliary tract at the

same time or secondary to seeding via the portal venous system of non-biliary infections (Appendicitis or sigmoiditis).[1] Hepatic abscess also develops after liver trauma or arterial embolization of trauma. Certain hepatic abscesses are caused by extra abdominal infections that infect the liver parenchyma or by preexisting liver lesions (Biliary cysts, hydatid cyst or necrotic metastases), most often via hematogenous route.

The paper also explores the prevalence of classical symptoms such as fever, abdominal pain, and jaundice, as well as any variations or unique manifestations observed in the studied population.[3] Addressing these variations may aid clinicians in early and accurate diagnosis, leading to improved patient outcomes. Assessing the sensitivity and specificity of these tests in the context of the local population can provide valuable guidance for clinicians in prioritizing diagnostic approaches and refining protocols for efficient patient management. Discussing the management strategies employed in the tertiary care centre in Silchar provides an opportunity to evaluate the effectiveness of current protocols and identify areas for improvement. Addressing factors such as the choice of antimicrobial agents, role of interventional procedures, and the need for surgical intervention can guide clinicians in optimizing the treatment algorithm for liver abscess patients. The findings challenge some prevailing notions about the epidemiology of liver abscess and underscore the importance of tailored diagnostic and therapeutic

This comprehensive analysis of liver abscess cases in Silchar, Assam, provides valuable insights into the regional variations in aetiology, clinical presentation, and management strategies approaches based on the specific characteristics observed in the studied population.

CASE SERIES

Over a 1 year 10 month period ranging from January 2022 to October 2023, twenty cases of hepatic abscess presented in the outpatient and emergency services of surgery department of Silchar medical college and hospital were studied and data compiled after informed written agreement. Inclusion criteria were all liver abscess patient needing intervention: Left lobe abscess, abscess of size >5 cm., impending rupture (>1 cm liver tissue between abscess and liver margin) and not responding to conservative management at the end of 48 hours. Patients with age less than 18 years, organized abscess and abscess in close proximity to large vascular structures in liver and pregnancy were excluded.

On a pre-defined proforma, a comprehensive history, including the patient's comprehensive history, including history of alcoholism, clinical examination and laboratory profile was documented. Using modified Kuppuswamy socioeconomic status, patients were divided into three socioeconomic classes upper, middle, and lower. All patients were subjected to a complete hemogram, liver function test, kidney function test and coagulation profile (PT/INR). Reference ranges of these investigations were defined by reference ranges of hospital laboratory. Blood and urine cultures were sent. Serologies for HIV and hepatitis B and hepatitis C viruses were also done. All patients were subjected to subjected to Mantoux test and chest radiogram. Patients with symptoms of cough with expectoration were subjected to sputum for acid fast bacilli (AFB) using Ziel Neeson (ZN) staining to rule out pulmonary Koch. After taking informed consent, all patients were subjected to ultrasound guided aspiration of liver abscess either by percutaneous needle or pigtail catheter. Interventions were done after correction of INR below 1.4 to those presented with coagulopathy. We preferred pigtail catheter in a single large (>10 cm) deep seated, partially liquefied abscess. In multiple small (5-10 cm) superficial and fully liquefied abscess, we tend to use percutaneous aspiration. Aspirate was collected in sterile container and sent immediately to microbiology for microscopic examination of wet mount for trophozoites of *Entamoeba histolytica*, gram staining, ZN staining for AFB. Samples were plated in aerobic, anaerobic, and fungal culture media. Intravenous ceftriaxone and metronidazole were administered to the patient empirically until a pus culture was obtained. Discharge was made, with the resolution of presenting complaints and return of laboratory values to that of normal

Mean age of patients was 33 years (range: 19-63 years).

Table 1: Age range of hepatic abscess patients.

Age range of patients (in years)	N
<40	13
>40	7

Table 2: Clinico-etiological profile of liver abscess.

Variables	N	Percentage (%)
Symptomatology of liver abscess		
Pain abdomen	19	95
Fever	18	90
Anorexia	18	90
Nausea/vomiting	10	50
Cough	3	15
Weight loss	8	40
Risk factors in liver abscess patients		
Alcoholic	9	
Diabetic	2	
Signs of liver abscess patients		
Pallor	8	40
Jaundice	5	25
Hepatomegaly	17	85
Splenomegaly	2	10
Ascites	2	10
Pleural effusion	6	30

Male to female ratio: 10:1. About 2/3rd of patients were from Upper lower/lower socioeconomic class according to

modified Kuppuswamy socioeconomic status scale (2022).[4]

Table 3: Radiological profile of liver abscess.

Variables	N	Percentage (%)
Lobe of liver affected		
Right	14	70
Left	4	20
Bilateral	2	10
No. of collections		
Solitary	13	65
Few <3	2	10
Multiple >3	5	25
Segment of liver involved		
VII	7	35
VI	5	25
VIII	2	10
V	2	10
IV	2	10
Rest	2	10

Table 4: Microbiological analysis of liver abscess.

Variables	N	Percentage (%)
Appearance		
Anchovy sauce	11	55
Purulent	8	40
Investigations		
Trophozoites visualized	11	55
Gram staining/ positive pus culture	8	40
AFP positive	1	5
Organism isolated		
E-coli	3	38
Klebsiella	2	25
Pseudomonas	1	12
Staphylococcus	1	12
Enterococcus	1	12

Table 5: Management profile of liver abscess patients.

Management	N	Percentage (%)
Percutaneous needle aspiration	5	25
Pigtail drainage	14	70
Conservative	1	5

Pain abdomen was the most common symptom (99%, n=19). Tender hepatomegaly was the most common per-abdominal examination. (85%, n=17) pleural effusion was evident (30%, n=6), however left sided and bilateral effusion were also encountered in 3% and 4% of patients, respectively. HIV was reactive in only 2% of patients and viral markers (HbsAg and anti HCV) were non-reactive in all patients.

Pain abdomen with fever was the most common symptom observed with hepatomegaly as the most common clinical finding. Major risk factor noticed among the population was history of alcoholism or diabetes. Right lobe of liver was most affected, with bilateral involvement noted in 10% of cases. Majority of cases reported solitary collections with mean abscess volume noted of size: 270±25 CC. Most common segment of liver involved was segment 7 (35%) followed by segment 6 (25%).

The 55 percent of hepatic abscess were amoebic in origin whereas 40 percent of the cases were pyogenic in nature, 5 percent of cases were Tubercular in origin. Out of the total cases of pyogenic abscess in 38 percent of cases *E. coli* were isolated followed by next common *K. pneumonia.*

For management, 14 cases, 70 percent of cases had pig tail insertion of their abscess content, 25 percent underwent percutaneous drainage whereas only 5 percent of cases underwent conservative management.

DISCUSSION

Liver abscess remains a prevalent health concern in the tropical regions of the Indian subcontinent. This study explores the diverse etiological agents contributing to liver abscess, with a particular focus on *Entamoeba histolytica* (amoebic), bacterial (pyogenic), *Mycobacterium tuberculosis*, with special consideration given to North Eastern region. In our study conducted the mean age of patients studied was 33 years, with age ranging from 19-63 years. In similar study conducted in Northern India the mean age of presented patients was reported as 45 years and Central India the mean age was reported as 41 years.[5,6] It can thus be inferred as the disease infects an age group of 30-50 years. Male to female in the present study was 10:1, study results in Central India reported as 6.6:1 and Northern India as 3:1.[5,6] It can be inferred that the disease affects males predominantly. Two thirds of the patients were from low socioeconomic class. In our study pain abdomen was the most common presentation of the patient with majority of them presenting with fever. This finding has been corroborated with multiple studies across Central, Northern and Southern India.[5-7] Conversely, jaundice and ascites, considered less common manifestations, were observed in 26% of our patients. This finding contrasts with earlier Indian studies reporting jaundice in 45-50%. Ultrasonography is the main investigation used to diagnose the cases of hepatic abscess. In our study the most common segment involved is segment 7, right lobe of lobe. Similar finding was found in study in Northern India where 50 percent of the cases studied was found in segment 7, Northern India, whereas a similar study in Southern India, 66 percent of the abscess were noted in right lobe of liver.[5,7] This predilection can be explained by the blood supply and anatomical nature of the liver. The right hepatic lobe is 2-3 times larger than left lobe, with right hepatic duct (9 cm) being shorter than left hepatic duct (20 cm). Also, right lobe receives blood from both the superior

mesenteric and portal veins, whereas the left hepatic lobe receives inferior mesenteric and splenic drainage. Portal vein being the major carrier of blood, right lobe receives almost 80 percent of blood supply to liver. Similar consideration applies to hepatic arterial supply and lymphatic channels. Therefore the proportion of pathogens from extrahepatic foci of infection entering the right lobe will be greater than left lobe.[8] In our study amoebic abscess contributed to 55% of cases whereas pyogenic abscess contributed to 40% studies and tubercular abscess being 5% cases. This is a very similar proportion to the study conducted in Northern India.[5] This is in stark contrast to studies conducted in USA/ Europe, where majority of cases are of pyogenic in origin, with incidence of 1.38/ million population. This difference might be attributed to lower socioeconomic status and the prevalence of amoebiasis in India. Although also 40% population of population has reported significant history of alcoholism, poor access to safe drinking water might be one of the significant reasons behind this. A notable pattern observed was that of tubercular liver abscesses. Uncommon occurrence of tubercular involvement in liver is attributed to unfavourable low oxygen levels for TB bacilli survival. Typically, primary focus is on lungs/ gastrointestinal tract, from where it disseminates hematogenous to liver via hepatic artery and portal vein. A majority of cases underwent pig tail drainage probably due to large mean volume of abscess found in this study. Aligning with contemporary management strategies favouring minimally invasive approaches, percutaneous pig tail drainage was the primary technique employed in the majority of cases. This reflects a paradigm shift towards more conservative yet effective interventions in the management of liver abscess.[9] Percutaneous pigtail catheterization would be a better management modality in hepatic abscesses with volume >150 ml.[10]

CONCLUSION

Young alcoholic male from lower socioeconomic group with amoebic liver abscess presenting as solitary right lobe abscess was the most common pattern in our series. Liver abscess was uncommon in female patients. Apart from amoebic and pyogenic, tubercular liver abscess were not so common etiologically. The average age of patients was 33 years. Pain abdomen with fever was the most common symptom with tender hepatomegaly as the most common elicited finding. Cough as a symptom point to associated significant pleural effusion. Presence of ascites should raise suspicion of tubercular liver abscess or associated CLD. Segment VII was the most commonly involved lobe of liver with pigtail drainage as the most common modality of intervention used.

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