

# A Descriptive Study on the Prevalence of Amoebic Liver Abscess in Eastern Afghanistan

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## Abstract:

Various studies suggest that Amoebic liver abscesses (ALA) are among the most common abscesses found in liver amoebic liver abscesses are caused by extra intestinal manifestation of *Entamoeba histolytica* (a protozoan parasite of the large intestine). This study was conducted to investigate the prevalence of ALA among Afghani patients according to various parameters described below.

**Patients and methods:** the study was conducted on a total of 60 subjects (mean age 36 years) from November 2019 up to November 2020 admitted to the Nangarhar Regional Hospital and Dawoodzai curative Hospitals located at Eastern Afghanistan, Jalalabad city, diagnosed cases of liver abscesses. History, physical examination, and laboratory investigations were obtained. Ultrasound guided aspiration was done and samples were investigated in the study population. Pus culture were done for bacteria and direct microscopic investigation were also done for finding the trophozoites of *E. Histolytica*. Other causes of liver abscesses were excluded and amoebic abscesses were come in for investigation. Data were statistically analyzed by the use of Microsoft Excel program.

**Results.** In the current study, 39 cases were diagnosed amoebic liver abscesses and included in the study. Majority of patients were of young age and male sex. Majority of them were from lower socioeconomic class (61.5%). Abdominal pain and fever were the most common presenting symptoms. According to lab findings ESR were elevated (84.1%), alkaline phosphatase (76.9%), WBC elevation (84.6%) and liver transaminases were elevated in 36% of these patients. The abscesses were predominantly in right lobe (71.7%) and solitary (71.7%). Abscess size in ultrasound ranged from 3cm to 14cm. Right lobe was predominantly involved in amoebic abscesses but left lobe involvement and diffuse involvement was also present.

**Conclusion.** The results of this study show that amoebic liver abscesses are commonly presenting in young aged patients of male sex, of low socioeconomic class having right lobe solitary amoebic liver abscess.

**Key words:** Amoebic liver abscesses, *E. histolytica*

## Introduction:

*Entamoeba Histolytica* is still a major health problem in all over the world, also of our country. *E. Histolytica* associated amoebiasis if untreated the trophozoite invades on intestinal mucosa and then spread through blood stream and reaches to various organs including liver and causes

abscesses in these organs. *E. histolytica* is the common intestinal parasite which causes diseases inside the intestinal lumen called amoebiasis, and out of the intestinal lumen called extra intestinal manifestations of amoebiasis, amoebic liver abscesses are among the most common extra intestinal complication. Amoebiasis still leads to mortality and ALA is the most common cause of death in Amoebiasis [1]. Overall, 10% of the world's population is infected with *Entamoeba histolytica* (*E. histolytica*) but out of this only 1% becomes symptomatic [2].

Liver abscess fall broadly into two categories- amoebic and pyogenic. Pyogenic Liver Abscess (PLA) is more common in developed world, while Amoebic Liver Abscess (ALA) is more common in developing world.

However, it is well known that the clinical features of ALA (acute onset of fever, abdominal pain and hepatomegaly) are very similar to those of pyogenic liver abscess (PLA), as are the ultrasonographic features. Thus, it is difficult to differentiate ALA from PLA either clinically or by ultrasound imaging [3]. At the same time, differentiating between PLA and ALA is important because the treatment regimen is different.

In developing countries, amoebiasis is more common due to poor sanitary conditions and lower socioeconomic status. Other predisposing factors for ALA are alcoholism, homosexuality and individuals with AIDS or immunosuppression. In developed countries, amoebic liver abscess is rare and is found almost exclusively in travelers and immigrants.

Fever and abdominal pain are the common presenting symptoms of ALA but there are some other uncommon manifestations are also present. Ultrasound is the best diagnostic test for diagnosing of ALA. Thus, ALA is further diagnosed by microscopic examination of pus for finding the trophozoite of *E. Histolytica* and also pus can be cultured for the detection of bacteria. The other laboratory findings are also present from the damage of liver parenchyma and the systemic manifestations of infection are also detected. With Early detection and treatment of ALA we are able to prevent mortality and morbidity associated with this disease [4].

This study was carried out to look for various aspects of ALA like demographic profile, clinical presentations, radiological and laboratory findings.

## Materials and methods:

The current study was conducted on a total of 60 Afghani patients from November 2019 up to November 2020 admitted to the Nangarhar Regional Hospital and Dawoodzai private Hospital all located in eastern Afghanistan, Jalalabad city by the diagnosis of liver abscesses. The patients were assessed according to the including and excluding criteria. Amoebic liver abscess patient was included in the study. The patient's age was in the range of 18 – 68 years.

Including criteria's:

1. Patients aged more than 18 years are included.
2. Patients had other type of liver abscesses were excluded

Excluding criteria's:

1. Patients had Hydatid cysts were excluded.
2. Patients that had bleeding diathesis were excluded.

3. Immunocompromised patients were also excluded from this study.

Finally, the results of total 39 cases were analyzed. In current study a written consent were obtained from all individuals.

**Data collection:** In the current study all included patients had amoebic liver abscesses for data collection from these patients, a questionnaire was used which included on medical history, age, sex, economic status and education. Information on the clinical features, hematological parameters such as WBC count, liver function tests, erythrocyte sedimentation rate (ESR), alkaline phosphatase (ALP), and ultrasound findings were collected from the patients.

**Collection of blood from patients:** A sample of 3 ml venous blood was collected from all patients under sterile conditions. Serum was separated from the clotted blood sample by centrifugation at 3500× rpm /10 min and stored at -20 °C for further serological investigations.

**Pus collection:** A pus sample was collected while ultrasound guided aspiration was carried out, then the pus was collected into a sterile bottle and immediately transported to the Laboratory for the direct microscopic examination of the smear and culture. A loop of fresh pus sample was inoculated directly onto the surface of pre-warmed MacConkey and blood agar plates and streaked. The inoculated plates were incubated aerobically at 37 °C. Plates were examined after 18–24 h of incubation for the presence of bacterial growth. Pus that had trophozoite of *E. Histolytica* were selected for the study and those culture negative for bacteria and also active trophozoite were not present in it. The presence of antibody against *Entamoeba Histolytica* were obtained and are included in the study.

Data were analyzed on by means of the Microsoft Excel program.

## Results:

The current study was conducted on 39 ALA positive cases from November 2019 to November 2020. Among the cases, 27 (69.2%) were male and 12 (30.7%) cases were of female sex. All cases were diagnosed ALA cases, the data were analyzed and the results are follows.

Table 1: Demographic variables of the ALA patients

Variables		No. of patients	Percentage(%)
Sex	Male	27	69.2
	Female	12	30.7
Age	18-40 years	25	64.1
	>40years	14	35.8
Economical status	Low	24	61.5
	Middle	12	30.7
	High	3	7.6
Education	Educated	12	30.7
	Non educated	27	69.2

Table #1 shows that ALA cases were more in male sex than females. Also, the most patients were of young age. Table suggests that ALA more commonly affects lower economical states or under developed countries. The incidence of ALA was high in non-educated population in comparison with educated population.

Table 2: Radiological results of the ALA patients

Variables		No. of patients	Percentage (%)
Abscess no.	Solitary	28	71.7
	Multiple	11	28.2
Abscess size	<4 cm	18	46.1
	>4 cm	21	53.8
Abscess location	Right lobe	28	71.7
	Left lobe	9	23
	Diffuse	2	5.1

Table #2 shows us that according to radiological value in most cases abscesses were solitary also ALA was more commonly present in right lobe of the liver. In most cases the abscess size were more than 4 centimeters.

Table 3: Clinical findings variables results of ALA patients

No.	Variables	No. of patients	Percentage (%)
1	Fever	32	82
2	Abdominal pain	30	76.9
3	Nausea	25	64.1
4	Jaundice	10	25.6

Table #3 shows that clinically fever and abdominal pain were the most common presenting symptoms in ALA patients, and nausea vomiting and also jaundice were the least occurring symptoms in ALA patients.

Table 4: various laboratory parameters of the ALA patients

No.	Variables	Value	No. of patients	Percentage (%)
1	WBC	>11000 /mm <sup>3</sup>	33	84.6
2	ALP	>147 UI/L	30	76.9
3	ALT	>154 UI/L	16	41
4	AST	>132 UI/L	12	30.7
5	Total Bilirubin	>2 mg/dL	7	17.9
6	ESR	>20	25	64.1

\*WBC= white blood cells, ALP= Alkaline phosphatase, ALT= Alanine aminotransferase, AST= Aspartate aminotransferase, ESR= Erythrocytic sedimentation rate.

Table #4 suggests that in most cases of the ALA patients white blood cells count were increased than normal level, also other lab parameters like alkaline phosphatase, liver transaminases and total bilirubin level were a little increased.

## Discussion:

Liver abscess is a collection of pus in the liver parenchyma. It is usually amoebic or pyogenic, and rarely tubercular or fungal in origin [5]. ALA can be suspected in any person living in the endemic region of *E. Histolytica*, who presents with fever, abdominal pain, hepatomegaly and liver tenderness [6].

In our study ALA were more commonly present in male sex of young age which is the same with other studies [7, 8]. In our study middle aged males were more affected which (63%) of patients had their age between 18-40 years. The reason is that these age people eats everything at everywhere. And also, they are under stress and undergoing hard working. So, they are susceptible for ALA. Male sex also more affected this result is also consistent with other studies. In our study males had 70% ALA cases. Das J et al., showed 77.5% male cases of ALA [9]. Reason is that in other world male are drinkers and are susceptible to ALA but in our country, males are under stress also do not seek medical attention in comparison with females so males tend to be more affected.

In our study Poor socio-economic state and lack of education both are related with high ALA incidence. This result is also convenient with other studies [10]. The reason is that both are risk factors for acquiring *E. Histolytica*. Also uneducated people do not seek medical attention and presents with complicated conditions. Our study is comparable with other studies Alam et al., [11].

In our study near all patients had fever at the time of diagnosis, also had abdominal pain especially right upper quadrant pain, these results are also convenient with others studies held at various countries of Asia. Findings on clinical examination were similar to those described previously in Sri Lanka and other Asian countries [12–14]. The reason is that when liver become infected the liver parenchyma become necrotized and acute inflammation occurs, so the clinical manifestation of inflammation is fever which is present in nearly all patients at the time of diagnosis, also liver swells and becomes enlarged. By swelling liver capsule are stretching and causing pain.

Hematological findings such as leukocytosis, elevated ESR and ALP were also comparable to those described previously [15, 16]. In our study leukocytosis were present at 84% cases and other laboratory parameters were also elevated accordingly. All of them indicates the presence of hepatocyte death and inflammation.

According to ultrasonography findings the ALA was more commonly present at right lobe of the liver, abscesses were solitary in most cases and abscess size were more than 4 cm in nearly most cases [17,18]. The reason of the right lobe of the liver involvement is that the right lobe is large and most of the blood of intestine reaches to the right lobe thus right lobe is more prone to the ALA.

At the end we can say that amoebic liver abscesses are more common in young males of low socioeconomic conditions living in tropical areas endemic to *E. Histolytica*. Theses abscesses are more commonly found in right hepatic lobe and solitary.

## Conclusion:

According to the result of the current study, *E. histolytica* causes intestinal and extra intestinal manifestations in patients, of which Amoebic liver abscesses are common. ALA should be considered in those peoples living in the endemic area of this parasite and someone young male with low socioeconomic status presents with fever, abdominal pain etc., ALA commonly affects right lobe of the liver. Ultrasonography is the best initial test for detecting abscesses. Then pus aspiration will be investigated for the presence of active trophozoite of *E. Histolytica* and for differential pus culture for bacteria. ALA causes high mortality and morbidity, so early detection and management prevents unwanted complications of it.

## Limitations

- Less number of patients included is a problem for accuracy
- Cost of research is also a great problem for a low economic country
- Lack of diagnostic tools is also a big problem
- Absence of PCR which can differentiate among various types of *Entamoeba*.

## Recommendations

- Further investigations are required to investigate the medical and surgical treatment results
- All patients should not use OTC medications but should consult with their own doctor.

## Data availability:

The data used to support the finding of this study are available from the corresponding author upon request.

## References:

- [1]. Haque R, Huston CD, Hughes M, Erik H, Petri WA Jr. Amebiasis. *N Engl J Med.* 2003; 348:1565–73.
- [2]. Rani R, Murthy RS, Bhattacharya S, Ahuja V, Rizvi MA, Paul J. Changes in bacterial profile during amebiasis: demonstration of anaerobic bacteria in ALA pus samples. *Am J Trop Med Hyg.* 2006; 75(5):880– 5.
- [3]. Salles JM, Moraes LA, Salles MC. Hepatic amebiasis. *Braz J Infect Dis.* 2003; 7(2):96–110.
- [4]. Mukhopadhyay M, Saha AK, Sarkar A, Mukherjee S. Amoebic liver abscess: presentation and complications. *Indian J Surg.* 2010;72(1):37-41.
- [5]. Lokanadham D. Clinical study of liver abscess at a tertiary care hospital. *International Journal of Recent Trends in Science and Technology.* 2015;15(3):654-56.

- [6]. Sharma N, Sharma A, Varma S, Lal A, Singh V. Amoebic liver abscess in the medical emergency of a North Indian hospital. *BMC Res Notes*. 2010;3:21.
- [7]. Farhana F, Jamaiah I, Rohela M, Abdul-Aziz NM, Nissapatorn V. A ten year (1999-2008) retrospective study of amoebiasis in University Malaya Medical Centre (UMMC), Kuala Lumpur, Malaysia. *Trop Biomed*. 2009; 26:262–6.
- [8]. Shirley DA, Farr L, Watanabe K, Moonah S. A Review of the Global Burden, New Diagnostics, and Current Therapeutics for Amebiasis. In *Open forum infectious diseases* 2018(Vol. 5, No. 7, p. ofy161).
- [9]. Das J, Majumdar S, Das S, Anwar SN, Ahmed H, Hossain I. A cross sectional descriptive study of etiology and clinical pattern of liver abscess: 50 cases. *Chatt Maa Shi Hosp Med Coll J*. 2013;12(3):44-48.
- [10]. Benetton ML, Gonçalves AV, Meneghini ME, Silva EF, Carneiro M. Risk factors for infection by the *Entamoeba histolytica*/E. dispar complex: an epidemiological study conducted in outpatient clinics in the city of Manaus, Amazon Region, Brazil. *Trans R Soc Trop Med Hyg*. 2005; 99(7):532–40.
- [11]. Alam F, Salam MA, Hassan P, Mahmood I, Kabir M, Haque R. Amebic liver abscess in northern region of Bangladesh: sociodemographic determinants and clinical outcomes. *BMC Res Notes*. 2014;7:625.
- [12]. Salles JM, Moraes LA, Salles MC. Hepatic amoebiasis. *Braz J Infect Dis*. 2003; 7(2):96–110.
- [13]. Robinson GL. Laboratory diagnosis of some human parasitic amoeba. *J Gen Microbiol*. 1968;53:69–79.
- [14]. Ayeh-Kumi PF, Ali IM, Lockhart LA, Gilchrist CA, Petri WA, Haque R. *Entamoeba histolytica*: genetic diversity of clinical isolates from Bangladesh as demonstrated by polymorphisms in the serine-rich gene. *Exp Parasitol*. 2001;99(2):80–8.
- [15]. Bhatti AB, Ali F, Satti SA, Satti TM. Clinical and pathological comparison of pyogenic and amoebic liver abscesses. *Adv Infect Dis*. 2014;4:117–23.
- [16]. Siddiqui MA, Ahad MA, Ekram AS, Islam QT, Hoque MA, Masum QAAI. Clinicopathological profile of liver abscess in a teaching hospital. *TAJ: J Teachers Assoc*. 2008;21(1):44–9.
- [17]. Kushwaha Y, Kapil R, Khurana S. A prospective study of one hundred cases of amoebic liver abscess in a secondary care hospital of Delhi. *Int J Med Public Health*. 2016;6(2): 84-87.
- [18] Jha AK, Das A, Chowdhury F, Biswas MR, Prasad SK, Chattopadhyay S. Clinicopathological study and management of liver abscess in a tertiary care center. *J Nat Sci Biol Med*. 2015;6(1):71-75.