

Demographic, Clinical, Laboratory and Management Profile in Patients of Amoebic Liver Abscess from Northern India

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ABSTRACT

Background: Amoebic liver abscess (ALA) is a serious extra-intestinal manifestation of amoebiasis and a major problem in developing countries. Due to rapid urbanization, improved sanitation and hygiene in India, there has been a shift in disease epidemiology towards non-communicable disease, but recent changes in epidemiological and clinical pattern in ALA are not well studied.

Aim: To evaluate recent demographic, clinical, laboratory and management profile in patient with ALA.

Methods: It is a prospective observational study conducted in the Department of Gastroenterology, SMS medical college, Jaipur, Rajasthan from June 2018 to December 2020. A predesigned semi structured questionnaire consisting of socio-demographic factors, risk factors, clinical, laboratory and management profile was used to collect data.

Result: A total 508 patients of amoebic liver abscess were analysed. Median age of presentation was 40 years, majority were males (90.4%) with chronic alcoholism (44.1%) and belonging to lower socio-economic class. Abdominal pain, fever and anorexia were the most common symptoms. A majority had right lobe involvement (77.6%) and solitary abscess in 67.5%. Most of the small liver abscesses (68%) were managed by medical treatment alone. Percutaneous needle aspiration was done in 62.6% patients, mostly for abscess size 5-10 cm (93%) with 90% success. A total of 24.6% patients underwent percutaneous catheter drainage, all successfully done. Intraperitoneal rupture was seen in 10% patient. Mortality was 1.5%.

Conclusion: This is one of the largest cohorts of ALA which shows that a majority of cases are males from lower socioeconomic status with history of significant alcohol intake. Early initiation of a combined therapeutic approach leads to early symptomatic improvement, fewer complications and better outcomes.

KEYWORDS: Amoebiasis, Amoebic Liver Abscess, Non-communicable Disease, Percutaneous Needle Aspiration, Percutaneous Catheter Drainage.

Introduction

Amoebic liver abscess (ALA) is the most common and serious extra-intestinal manifestation of amoebiasis caused by *Entamoeba Histolytica*.¹ It remains a major issue in India due to economic constraints, poor hygiene and sanitation, and lack of health education. It is transmitted by the faecal-oral route. According to a recent study from our institute, ALA is responsible for 7% of hospital admissions.² The major predisposing factors are alcohol ingestion, diabetes mellitus, and immunodeficiency or malnutrition.³⁻⁵ It has varied clinical presentations and complications. The primary mode of treatment of ALA is medical. However, a significant proportion requires some form of drainage procedure.^{6,7} Percutaneous drainage has been found necessary in fewer patients in earlier series, but recently, early use of drainage procedures in uncomplicated abscesses is increasing.^{6,8,9} Rapid urbanization, improved sanitation and hygiene in India in the last few decades have led to the transition of disease epidemiology towards the dominance of non-communicable disease and injuries.¹⁰ But recent changes in epidemiological and clinical patterns in ALA are not well studied. The present study aims to evaluate the demographic, clinical, laboratory and management profile of patients with amoebic liver abscess (ALA).

Methods

The present study was conducted at the Department of Gastroenterology, SMS Medical College, Jaipur, Rajasthan. It was a prospective observational study. The study was approved by the ethical committee of SMS medical college, Jaipur. Data was collected from June 2018 to December 2020. A total of 508 patients with ALA were included in the study. Informed written consent was taken from all patients included in the study. A detailed history including sociodemographic factors, comorbidities and risk factors was taken. Clinical symptoms were used to make the diagnosis of ALA, which was supported by radiological evidence (ultrasound/computed tomography [CT]), positive serology results for *E. histolytica*, response to medical management, and pus characteristics (anchovy sauce appearance) on gross examination. All patients underwent blood investigations including complete blood

count, blood sugar, testing for human immunodeficiency virus (HIV), liver and renal function tests, amoebic serology. Chest radiography and abdominal ultrasound were done on all patients. Computed tomography of the abdomen and/or thorax was done if required. All patients were treated with metronidazole (40mg/kg/day divided into three doses). Inclusion criteria for percutaneous drainage techniques were abscess size > 5cm, left lobe abscess, no response to conservative management at the end of 48-72h, impending rupture (< 1cm liver tissue between abscess and liver margin). The patients with abscess size in the range of 5-10cm underwent percutaneous needle aspiration (PNA) whereas percutaneous catheter drainage (PCD) was considered in patients with abscess size > 10cm or abscess not responding to PNA. All patients were followed to assess for clinical improvement, length of hospital stay and development of any complications. The outcome of the patients was recorded in the 2nd and 4th weeks.

Statistical Analysis

Data was entered in MS Excel and analyzed by using SPSS software version 21. Categorical variables were expressed as percentages and analyzed using the Chi-square test or Fisher's exact test. Continuous variables were expressed as mean or median and analyzed using the Mann-Whitney test. Demographic factors and clinical characteristics were summarized with percentages for categorical variables and median for continuous variables.

Result

A total of 560 patients with liver abscesses were assessed. Amoebic liver abscess was diagnosed in 508 patients and included in the present study. The demographic, clinical features and laboratory data of all included patients were analysed and the findings are as follows:

Socio-demographic Distribution

The median age of presentation was 40 years (range, 12-86 years). The majority of patients (50%) were in the age group of 21-40 years. Most of the patients were male (90.4%). Almost half of the patients had a significant

history of alcohol consumption followed by diabetes (10%). Only 4 patients were HIV positive (0.8%). The majority of patients belonged to the lower socioeconomic class (68%) and were from rural areas (56.3%). (Table 1)

Clinical Profile

Although symptoms of ALA were nonspecific, abdominal pain (93.1%), fever (89.8%) and anorexia (55.3%) were the commonest, compelling admission. Whereas hepatomegaly (92.5%) and right hypochondriac (RHC) tenderness (79.1%) were the common clinical findings. (Table 1)

Laboratory Profile

Sixty-seven per cent of patients had anaemia with median haemoglobin 11 gm/dl (3.4-16.7). The majority of patients had mild anaemia (55%). Leucocytosis, increased alkaline phosphatase, decreased serum albumin, jaundice were distinct findings seen in 62.5%, 70.8%, 63%, 6.5% of patients respectively on laboratory examination. Serology test for *Entamoeba histolytica* was performed in 6.7%; all had positive results.

Imaging Profile

Pleural effusion was seen in 21.2% of patients on chest X-ray and/or USG thorax. On ultrasound abdomen assessment, involvement of the right lobe (77.6%) was more common than the left lobe (11.8%). The majority of patients had a solitary liver abscess (67.5%). The medium abscess size was 8 cm with a range of 2-19 cm. Most patients had abscess sizes between 5-10 cm (67.6%) followed by more than 10 cm in 20% of patients. Computed tomography of the abdomen and/or thorax was done in almost sixty per cent of patients. (Table 1)

Treatment Modalities

All patients were treated with metronidazole 2.4 g/d for 10-14 days. Almost seventy per cent of liver abscesses of size < 5 cm were successfully managed by medical management alone. PNA was performed on 318 (62.6%) patients for abscesses ranging in size from 5 to 10 cm (93%). Two hundred twenty-one (76.47%) patients

Table 1: Socio-demographic and clinical profile.

		N (508)	%
Age distribution	0-20	24	4.7
	20-40	254	50
	40-60	170	33.5
	60-80	58	11.4
	>80	2	0.4
Risk factors	Alcohol Abuse	224	44.1
	DM	50	9.8
	HIV	4	0.8
Socioeconomic status	Upper Class	29	5.7
	Middle Class	131	25.7
	Lower Class	348	68.4
Symptoms	Pain abdomen	473	93.1
	Fever	456	89.8
	Anorexia	281	55.3
	Cough	46	9.1
	Diarrhea	22	4.3
Sign	Hepatomegaly	470	92.5
	RHC tenderness	402	79.1
	Anemia	340	67.9
	Pedal edema	138	27.2
	Icterus	33	6.5
Abdomen Imaging	Solitary	343	67.5
	Multiple	165	32.5
	Right	394	77.6
	Left	60	11.8
	Bilateral	54	10.6

responded to a single aspiration. The other ninety-seven patients were subjected to a second aspiration within 2-7 days of the first aspiration. PNA was considered unsuccessful in twenty-nine (10%) patients. All of these patients were successfully treated with catheter drainage. A total of one hundred twenty-five patients (24.6%) underwent PCD, all was successfully done. PCD done in abscess size > 10 cm (68%) and abscess size < 10 cm (32%). The median duration of PCD was 9 days (range 3-25 days). (Table 2)

Complications

Pleural effusion was the most common complication seen in 21.2% of patients. However, the majority of patients

had reactive pleural effusion but around 20% of patients required placement of inter-costal drainage for rupture abscess. Fifty-one (10%) patients had intraperitoneal rupture. Ultrasound-guided drainage was done in forty-five patients with intraperitoneal rupture and others underwent laparotomy. Acute kidney injury was present in 9.8% of patients. Sixteen (3.1%) patients had biliary communication for which ERCP with stenting was done. A total of eight patients died due to complications of peritonitis or pleural rupture.

Discussion

ALA can develop at any age, but in the present study, it has been identified predominantly in young, middle-aged men of rural and lower socio-economic class, which is comparable to various other studies.^{3,4,11} Alcohol and diabetes have been identified as major predisposing factors in the present study, seen in 44.1% and 10% of subjects respectively, which were similar to previous studies.^{3,4,12,13} There were conflicting results of HIV infection in ALA. Various previous studies from Taiwan showed a higher prevalence of HIV infection in ALA patients.^{14,15} However, according to various reports from India and our study (0.8%), the prevalence of HIV was lower, except in the study by Singh et al (13%).^{5,16,17}

The incidence of fever, upper abdominal pain, and tender hepatomegaly were not different from that reported by other groups.^{3-5,12,13} Distinct findings on laboratory investigation in our study were leucocytosis, raised SAP, and low albumin. Similar results have been reported in various other studies.^{3,4,12,13} Various previous studies have reported jaundice in 45-50% of the cases of ALA,¹⁸⁻²⁰ but, jaundice occurred in only 6.5% of cases in our study. Due to the early use of percutaneous drainage for large abscesses (> 5 cm), coupled with effective anti-amoebic therapy, it has become less common. Other recent studies have found a low incidence of jaundice.^{4,13} The serology test for *Entamoeba histolytica* was performed on only 6.7% of patients due to the test's unavailability in our institute and the majority of patient's inability to afford it in private laboratories.

Pleural effusion was the most common complication of ALA, accounting for 21.2% of cases, which is comparable to various other studies.^{12,13} However,

Table 2: Comparison of percutaneous needle aspiration and catheter drainage.

Parameter	Percutaneous Needle Aspiration (n=289)	Percutaneous Catheter Drainage (n=125)	P-value
Time needed for 50% reduction of abscess cavity	Median - 9 days (range 2-27) days	Median - 6 days (Range 3-15) days	<0.0001
Hospital stay	Median - 4 days (range 2-13) days	Median - 5 days (range 2-17) days	<0.0001

around 20% of patients with pleural effusions required placement of inter-costal drainage for rupture abscess in the pleural cavity. Intraperitoneal rupture is considered to be the second most common complication of ALA seen in 10% of patients compared to 26% by Mukhopadhyay et al in 2009.¹² This low incidence in our study can be explained by the early use of percutaneous drainage in medium to large abscesses. In the present study, abscess-biliary communication was found persistently in 13% of patients with PCD, which was lower than previously reported by Agarwal et al (27%) in 1995.²¹ It may be due to early drainage of large liver abscess with PCD in our study. There was significant improvement in biliary drainage after 48 hours in all patients with ERCP with plastic stenting.

On ultrasound abdomen examination of ALA cases in our study, the majority (77.6%) of abscesses were located in the right lobe and were single (67%). Similar findings have been reported by Sharma et al (2003) and Kushwaha et al that the right lobe of the liver is usually affected and is predominantly a solitary lesion in 30-70% of cases.^{4,22} Multiple liver abscesses have been reported in 0-16% of patients with ALA.^{1,23} In the present study, multiple liver abscesses were seen in 32.5% of the patients, which exceeds the previously reported rates. An isolated left-lobe abscess was observed in 12% of our patients, which is comparable to other reports.^{12,24,25}

The primary mode of treatment of an amoebic liver abscess is medical. However, a significant proportion of such patients remain non-responsive to medical therapy alone (7.1% to 72.7%) and require some form of drainage procedure.^{6,7} There is a controversy regarding the maximum size of abscess that can be managed conservatively. Ghosh et al. found that abscess size < 5 cm

was effectively managed conservatively and a favourable response of combined treatment was seen only in medium-to-large abscesses (5-10 cm).⁹ Similarly, Freeman et al and Ramani et al reported the advantage of combined medical with percutaneous therapy only in abscess size > 6 cm.^{26,27} Therefore, in the present study, liver abscess of size < 5 cm was initially managed conservatively and 68% of these patients effectively responded to medical management alone. Similar results were also reported in a recent study by Agarwal et al (70%) in 2020 but higher than reported by Khanna et al (2005).^{25,28} The success rate of PNA in the current study is 90%, which is higher than the 60% reported by Rajak et al in 1998 and comparable to recent studies.^{6,28,29} In our study, one hundred twenty-five patients (24.6%) underwent PCD; all were successfully done. In contrast to previous studies, the median duration of hospital stay in our study is significantly lower in the needle aspiration group compared to the PCD group, which may be due to PCD done in patients with larger and complicated abscesses.²⁹ Although the time needed for total resolution of the abscesses could not be assessed in the present study, the time needed for 50% resolution of abscess cavity is significantly lower in PCD compared to PNA, which is comparable to other studies.²⁹⁻³¹

In recent years, with the advent of pigtail catheter drainage, the role of surgical exploration in ALA with peritoneal rupture has been mainly confined to haemodynamically unstable patients.³² In the present study, the majority of patients with peritoneal rupture (88%) were managed by ultrasound-guided catheter drainage. The overall mortality rate seen in ALA from various series ranges from 2-15%.^{13,18} In our study, the mortality rate was 1.5% and correlated to a lesser number of complicated liver abscesses because of early use of percutaneous drainage in larger abscesses.

Conclusion

This is one of the largest studies from Northern India which showed no significant differences observed in socio-demographic, clinical and laboratory profiles of patients with ALA in the last 2-3 decades. This study revealed that the number of patients with multiple amoebic liver abscesses is increasing and early initiation of a combined therapeutic approach, especially in medium to

large abscesses, leads to early symptomatic improvement, fewer complications and better outcomes.

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