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Original Research Article

Effective treatment options in amoebic liver abscess in a tertiary care setting in West Bengal: an observational study, India

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ABSTRACT

Background: Conservative management and image guided drainage have emerged as mainstay of the treatment in Amoebic Liver Abscess (ALA), with surgery used in complicated cases. The current study was conducted with an objective to demonstrate the effectiveness of the different treatment options in ALA.
Methods: An observational study was conducted on 100 patients, aged 19 to 60 years, admitted with sonographic evidence of Amoebic Liver Abscess (ALA) in the General Surgery wards of a tertiary care hospital in Kolkata. Patients coming for regular follow-up after completing treatment were included. On completion of the treatment before discharge a repeat ultrasonography of the upper abdomen was done to confirm remission.
Results: Majority of the patients were male, Muslim, rural resident and within 30 – 40 years age. Chief complaints were pain (100%), fever (60%) and abdominal swelling (80%). Tender hepatomegaly (80%) and icterus (36%) were present. Majority patients had the left lobe of the liver affected (72%) and abscess dimension <6 cms (66.67%). Out of the participants with unruptured abscess 21.87% had multiple abscesses. Out of 64 patients subjected to conservative therapy, 44 were successfully managed. Success rate of 72.73% was observed among 44 patients receiving ultrasound guided needle aspiration. All twenty patients subjected for pigtail catheter drainage were cured. Four patients underwent laparotomy and open drainage following intraperitoneal rupture.
Conclusions: Conservative treatment was observed to be sufficient in majority of cases of amoebic liver abscess of lesser size with percutaneous catheter drainage useful in large abscess. Surgical intervention was required in ruptured or complicated abscesses.

Keywords: Abscess, Amoebic liver abscess, Aspiration, Catheter, Conservative treatment, Drainage, Laparotomy, Liver abscess, Open drainage, Ultrasonography

INTRODUCTION

Amoebiasis is the infection of the human gastrointestinal tract by Entamoeba histolytica, a parasite that is capable of invading the intestinal mucosa and may spread to other organs, mainly the liver. *Entamoeba dispar*, an amoeba morphologically similar to *E. histolytica* also colonizes the human gut and has been recognized recently as a separate species with no disease potential.[1-3] The Entamoeba involves about 10% of world population, with only 10% of infected cases develop the clinical syndrome of amoebic manifestations.[4] The incidence of amoebic liver abscess (ALA) has been reported to vary between 3% and 9% of all cases of amoebiasis. *E. histolytica* is

endemic in Mexico, India, Africa, and parts of Central and South America.[5] The clinical diagnosis of an amoebic liver abscess may be difficult to establish because the symptoms and signs are often nonspecific. Since 10-15% of patients present only with fever, amoebic liver abscess must be considered in the differential diagnosis of fever of unknown origin.[4]

In this era of high-resolution imaging, ultrasound is still the mainstay in making the diagnosis. The sensitivity of it is as high as 80-95%.[6] In difficult cases ultrasonography (USG) guided needle aspiration and CT scan are useful. Ultrasound is also helpful in detecting ruptured liver abscess, associated with biliary disease and peritonitis. Serological test do help in making the diagnosis, but high false positivity in endemic region has restricted its role. Demonstration of cysts/ trophozoites by exfoliative cytology is another means of confirming the diagnosis. In majority of cases diagnosis is made on history, clinical examination, ultrasonography and diagnostic aspiration of typical anchovy sauce. Amoebic liver abscess, undiagnosed and untreated, has a very high mortality rate, of almost 100%.[7] With early diagnosis and prompt institution of specific therapy, the prognosis is excellent and the mortality is extremely low.[8] There is a difference in opinion in literature regarding the maximum size of abscess which can be treated by conservative method alone. Majority of ALA are usually treated by conservative management only.[9-11] However there is wide practice of aspiration and drainage in all cases with belief that aspiration hastens the clinical recovery with no procedural morbidity.[12] The indications for drainage procedures are large size abscess having compression sign or jaundice, persisting fever with chills, pain in the right upper quadrant of abdomen and high chances of rupture.[13] Ultrasound guided aspiration has both diagnostic and therapeutic advantages. Many authors have shown better outcome of liver abscess, either after USG guided aspiration or percutaneous catheter drainage in selected cases irrespective of nature of abscess.[14,15] Percutaneous catheter drainage is opted for symptomatic larger abscess having either thick content or features of secondary bacterial infection, resistant to drug therapy.[16] The current study was conducted to describe the effectiveness of different types of treatment modalities of Amoebic Liver Abscess (ALA) in a government tertiary care setting.

METHODS

Study design and population

A follow-up observational study was conducted on the patients admitted with sonographic evidence of Amoebic Liver Abscess (ALA) in the General Surgery wards of a tertiary care hospital in Kolkata from July, 2016 to Decemeber, 2017. Written informed consent was obtained from the participants of the study. Patients within the age group of 19 to 60 years, who completed the course of the treatment were considered for the study. However, those who did not come for at least 2 subsequent advised follow-up visits were excluded from the study along with those diagnosed with any other chronic diseases before or after the provision of treatment for ALA. A total of 100 patients were observed within the stipulated time maintaining all the mentioned criteria.

Table 1: Standard treatment protocol practiced following radiological diagnosis of amoebic liver abscess (ALA).

Criteria for conservative management (drug therapy only)	Criteria for USG guided aspiration (along with drug therapy)	Criteria for per-cutaneous drainage (along with drug therapy)	Criteria for Laparotomy and drainage
• Size < 6 cm. • No features of rupture /impending rupture. • No compression effects. • Symptoms subsiding after 48-72 hours of treatment.	• Feature of impending rupture/compression sign. • Size ≥ 6 cm. • Multiple abscesses involving both left and right lobe. • Failure in the improvement / aggravation on conservative treatment even after 72hours.	• Failed USG-guided needle aspiration (e.g. due to thick collection) • Features of secondary infection.	• Ruptured abscess in the peritoneal cavity • Features of peritonitis. • Complicated ALA ruptured in the pleural/ pericardial cavity.

Study technique

Patients with suggestive clinical features of ALA were investigated with USG and the radiologically confirmed cases were included in the study. On USG if the suspected lesion had fine or thick echogenic wall with hyper- and hypo-echoic mixed pattern or homogenous hypo-echogenic pattern or hypo-echoic and anechoic mixed pattern, the diagnosis of ALA was provisionally made and the patient was included in the study. Associated right sided pleural effusion was taken as evidence of rupture of abscess. An aspiration of typical

anchovy sauce pus under the ultrasound guidance was also considered as evidence of ALA where echogenicity remained inconclusive. After diagnosis the patients received stipulated treatment as per standard protocol practiced, as shown in Table 1.

On completion of the treatment before discharge a repeat USG of the upper abdomen was done to confirm remission of abscess. The patients were advised for follow-up every three months or recurrence of symptoms, whichever was earlier up to six months following discharge from the hospital. On every follow-up the patients were evaluated clinically. The data was collected with the help of a pre-designed pre-tested data collection form, containing the socio-demographic and clinical information pertaining to each individual patient.

Informed consent from the study participants were obtained before including the participants in the study. No intervention by the investigators were made on the treatment protocol followed for the participants.

Study variables

Among the socio-demographic variables age of the patients, gender and their religion were described. However, the clinical variables included, variables related to clinical examination, variables related to findings of blood work-up, variables related to sonographic findings. The outcome of the treatments provided were observed in terms of proportions of cure following a particular treatment modality. The chief complaint, findings of icterus and hepatomegaly were considered important among the clinical examination variables. Leucocyte count and serum bilirubin concentration were noted as part of the blood work-up of the patients. Among the radiologic findings size of the abscess, whether ruptured or not, multiple or single were the important considerations. Involvement of hepatic lobe was also noted. Now the differences in outcome were not subjected to any test of hypothesis, since the selection of the participants was by non-probability sampling.

RESULTS

Background characteristics

Among the 100 patients included in the study majority (96%) were male patients, with four female patients. These four female patients were within the age group of 30-40 years. This age group was the most common age of presentation with total 60% of the participants belonging to this group. Participants belonging to the younger age group i.e. lesser than 30 years and those belonging to the older age group i.e. more than 40 years were comparable in proportion, both being 20%. All the female patients belonged to Islam. Among the male patients majority were Muslims. Majority of the patients including the four female participants included were residents of rural area.

Table 2: Distribution of the participants according to selected clinical variables (n = 100).

Clinical variables		Number (%)
Chief complaint	Pain abdomen	100 (100.00)
	Fever	60 (60.00)
	Swelling of abdomen	80 (80.00)
Clinical examination	Tender hepatomegaly	80 (80.00)
	Icterus	36 (36.00)
Blood work-up	Increased leucocyte count	60 (60.00)
	Increased serum bilirubin level	36 (36.00)

Clinical presentation

The clinical presentation the patients is summarized in Table 2. The patients presented with pain abdomen, fever, swelling of abdomen. In all the patients, pain was the chief complaint. Fever was present in 60% of the patients at the time of presentation, while 80% complained of swelling of abdomen. On clinical examination tender hepatomegaly and jaundice were elicited. While a tender hepatomegaly was present in 80% of the patients, icterus was observed in 36% of the patients. On routine investigation 60% of the patients had increased leucocyte count, while the remaining patients had a normal count. On biochemical investigation 36% had an increased serum total bilirubin level, while the rest 64% had a normal level of total bilirubin.

Table 3: Distribution of the patients according to sonographic findings.

USG findings		Number (%)
Condition of abscess (n=100)	Ruptured	4 (4.00%)
	Unruptured	96 (96.00%)
Lobe involved (n=100)	Left lobe	72 (72.00%)
	Right lobe	28 (28.00%)
Size of unruptured abscess (n=96)	<6 cms	64 (66.67%)
	6 – 10 cms	24 (25.00%)
	≥ 10 cms	8 (8.33%)
Number of abscess [unruptured] (n=96)	Single	75 (78.13%)
	Multiple	21 (21.87%)

Table 3 depicts the sonographic findings. On USG of abdomen, four patients including two female patients appeared to have ruptured abscess. In most of the patients (72%) the left lobe of the liver was affected. In the remaining 28% right lobe was involved, however no patients had evidence of involvement of both lobes of liver. However, the radiologic evidence suggested that in majority (66.67%) the abscess were <6 cms in dimension, while 25.00% had dimension of 6-10 cms. Out of the participants with unruptured abscess 21.87% had multiple abscesses. Those having unruptured multiple abscesses majority (seventeen patients) had a dimension of 6-10 cms and four patients had a dimension of ≥10 cms.

Among the patients with unruptured abscess 78.13% had single abscess.

Treatment outcome

The treatment outcomes of different treatment categories are shown in Table 4. Sixty-four percent patients were given conservative treatment. These patients had been included as per formulated protocol. Out of these 64 patients, 44 were successfully managed by conservative treatment. Twenty patients showed non-resolution of fever and pain. Overall success rate of conservative treatment was 68.75 %. Forty-four (44%) patients were subjected to ultrasound guided needle aspiration and medication. It included 20 patients non-responsive to conservative treatment and 24 directly selected in this category as per formulated protocol. Out of these 44 patients, 32 were managed successfully. Overall success rate of ultrasound guided needle aspiration was 72.73%. Twenty patients were subjected for pigtail catheter drainage Out of these 12 patients were cases of failed ultrasound guided aspiration. 8 were direct entry in this category as per formulated protocol. This procedure was successful in all the 20 patients.

Table 4: Description of treatment outcome among the patients.

Management offered	Type	Size	Number of patients subjected	Number of patients cured	Number of patients failed
Conservative management (n = 64)	Single	<5 cms	40 (100.00%)	40 (100.00%)	0 (0.00%)
	Single	5 cms to <6 cms	24 (100.00%)	4 (16.67%)	20 (83.33%)
	Overall		64 (100.00%)	44 (68.75%)	20 (31.25%)
USG guided aspiration (n = 44)	Single	5 cms to <6 cms	20 (100.00%)	20 (100.00%)	0 (0.00%)
	Multiple	6 cms to <10 cms	24 (100.00%)	12 (50.00%)	12 (50.00%)
	Overall		44 (100.00%)	32 (72.73%)	12 (27.27%)
Percutaneous catheter drainage (n = 20)	Multiple	6 cms to <10 cms	12 (100.00%)	12 (100.00%)	0 (0.00%)
	Single	≥ 10 cms	8 (100.00%)	8 (100.00%)	0 (0.00%)
	Overall		20 (100.00%)	20 (100.00%)	0 (0.00%)

All patients showed improvement in symptoms. Catheter was removed after 14 - 21 days. Success rate of this modality was 100%. Four patients underwent laparotomy and open drainage due to intraperitoneal rupture. They were discharged after 14 post-operative days with uneventful postoperative period.

DISCUSSION

Hoffner et al reported that Amoebiasis is predominant among males 3-10 times more than females.[5] But in the current study with amoebic liver abscess, there was only four female out of 100 patients. This may be due to the fact that female patients actually reported less in the hospital set-up, inducing selection bias. Also, this may point to less proportion of females with amoebiasis developing ALA. Marginal Muslim preponderance in the study was possibly reflects the racial pattern of the catchment area of the hospital.

Most patients were febrile and having right-upper-quadrant pain, point tenderness over the liver was common. This was comparable to Hathila et al, who observed tenderness in upper right quadrant and fever to be most common presenting feature at a tertiary care setting in Gujarat.[17] About one-third of patients with chronic presentations were febrile. Thus, the clinical diagnosis of an amoebic abscess were noted to be difficult to establish because the symptoms and signs were nonspecific. A probable differential diagnosis of pyrexia of unknown origin was always considered in consonance with the study by Andrade and Reed.[4]

With early diagnosis and prompt institution of specific therapy, the prognosis was excellent and the effectiveness of the treatments were encouraging. This finding was similar to Hunter et al who reported very low mortality with prompt treatment.[8]

Nitroimidazoles, are the mainstays of treatment for invasive amoebiasis. Drainage should be considered in patients that have no clinical response to drug therapy within 3 days or those with a high risk of abscess rupture defined as having a cavity >5 cm in diameter or by the presence of lesions in the left lobe. The effectiveness of drug therapy was also demonstrated by Hathila et al.[17]

Similar to the current study they also observed that percutaneous aspiration was helpful in smaller abscesses where only drug management failed. Though not investigated in the current study, bacterial coinfection of amoebic liver abscess has been observed; therefore, addition of antibiotics, drainage, or a combination of both, to Nitroimidazole therapy may be necessary.

Image-guided percutaneous treatment (aspiration or catheter drainage) has replaced surgical intervention as the procedure of choice for decreasing the size of an abscess. The high success rate in the current study supports this fact. Ramani et al in their study on USG-guided aspiration of ALA, concluded that aspiration resulted in a better initial response and significant early clinical improvement, but the long-term outcome was similar among aspirated and non-aspirated (only conservative management) group.[9]

However, in the current study the effectiveness of aspiration and also of only conservative management was found even better with a lesser dimension of the abscess cavity. The study by Sharma et al also reported a better outcome in ALA.[11] They compared the outcome of ALA with pyogenic abscess. But also found out that conservative management in lesser dimension ALA was useful as has also been reported by Hathila et al when comparing among different etiologies of liver abscesses.[17]

Surgical drainage of amoebic liver abscesses has largely been replaced by antibiotic therapy as witnessed by 100% cure of patients with <5 cms dimension of abscess. But larger abscesses failed to regress with conservative therapy. The most common indication for surgical intervention is to manage abscesses that have failed to respond to more conservative therapy. Laparotomy is indicated for life-threatening hemorrhage that may or may not be related to abscess rupture, or when the amoebic abscess erodes into a neighboring viscus and control of the involved viscus is necessary. In the current study four patients who underwent laparotomy were following rupture of the abscess.

Conservative treatment was observed to be usually sufficient in majority of cases of amoebic liver abscess of lesser size. Percutaneous catheter drainage required in large abscess having complications was a viable option to drain the high viscous content of ALA adequately. Surgical intervention was required in few special cases only. Though the current study definitively provides evidence for good effectiveness of conservative management and also for image-guided aspiration, a randomized study could have conclusively proven the importance of non-surgical techniques in ALA.

CONCLUSION

Conservative treatment was observed to be sufficient in majority of cases of amoebic liver abscess of lesser size with percutaneous catheter drainage useful in large abscess. Surgical intervention was required in ruptured or complicated abscesses

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