

Liver abscess: A retrospective analysis

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ABSTRACT

Liver abscess (LA) is defined as a collection of purulent material in the liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infection. Here, we report a retrospective analysis with an aim to evaluate the clinical presentation, etiology, manifestations, comorbidities, and different treatment options in patients with LA. This retrospective study was conducted to collect and analyze information from patients diagnosed with LA who were admitted to a tertiary care academic hospital.

Key words: Amoebic, Liver abscess, Lobes of liver, Pyogenic

Liver abscess (LA) is defined as a collection of purulent material in the liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infection. It is a common condition across the globe; however, in middle Europe and North America, LA is a rare condition. The annual incidence of pyogenic LA has been estimated at 2.3 cases per 100,000 populations and is higher among men than women (3.3 vs. 1.3 per 100,000) [1-3].

Two-thirds of all LA in the developing countries are caused by the amoebiasis, a consequence of infection with *Entamoeba histolytica* and approximately three-fourths of them are pyogenic [1]. The condition is endemic in tropical countries such as India due to poor sanitary condition and overcrowding. The chances of LA account for 3–9% of all cases of amoebiasis [2]. However, pyogenic and tubercular etiologies should always be entertained in the differentials. The incidence of tubercular LA has recently increased due to increased incidence of predisposing factors such as alcoholism, irrational usage of antibiotics, emergence of drug-resistant bacilli, and immunodeficiency. The most common symptoms of a pyogenic LA are saw-tooth pattern fever, nausea, vomiting, anorexia, upper right abdominal pain, hematological analysis of leukocytosis, anemia, and positive blood, or aspirate culture for bacterial etiology.

The treatment of LA has evolved remarkably with percutaneous drainage taking center stage. Radiological imaging has improved diagnostic competence and has altered therapeutic strategy by allowing the possibility of the percutaneous approach using needle aspiration or catheter drainage. The gold standard for LA is the surgical resection. However, recent evidence from percutaneous drainage procedure has shown a favorable outcome with a shorter length of stay compared to the conservative mode of treatment. Precise diagnosis of the LA etiology is critical for appropriate management as it depends on the specific use of

antibiotics and bacteriology. Open surgery should be reserved for management of complicated cases like ruptured liver abscess either in the peritoneum or thorax.

We report a retrospective analysis to evaluate the changing trends in microbiological etiology, clinical profile, and management outcomes of patients diagnosed with LA.

CASE REPORT

A retrospective analysis was conducted from January 2016 to July 2018 at a tertiary-care referral center, and 120 consecutive patients with LA were enrolled in the study. The diagnosis of LA was based on the clinical findings and evidence from imaging studies either abdominal ultrasonography or contrast-enhanced computerized tomography. Inclusion criteria included all patients with pyogenic, amoebic, and post-traumatic LA of either sex aged 18 years and above. The patients without clear records or who were transferred to another hospital without completing the treatment were excluded from the study.

The demographic data, etiology, underlying diseases, clinical presentation, imaging features, laboratory examinations, treatment, and clinical outcomes were analyzed. The patient data were anonymous, and the health-care provider identification numbers were encrypted. The data of a total of 120 patients were collected in MS Excel and analyzed retrospectively using descriptive statistics.

Medical records of a total of 120 patients with LA were studied and analyzed. The majority of patients were middle-aged males falling into the age group of 30–40 years followed by patients in the age group of 20–30 years and a male to female ratio of 24:1 were recorded. The common symptoms and signs of LA were fever (64%), pain and tenderness in the right upper quadrant of the stomach (100%), and jaundice (39.1%). About

88.4% of the abscesses were located in the right lobe of the liver, and 2.5% of our patients had solitary abscesses. We found 29.1% of the abscesses to be amoebic in etiology, 50.9% to be pyogenic, 12% to be indeterminate, and 8% to be amoebic with secondary bacterial infection.

DISCUSSION

LA, in particular, amoebic LA is common in the tropical region like the Indian subcontinent. The common etiological agents for the LA are *E. histolytica* (amoebic), *Mycobacterium tuberculosis* (bacterial), and various fungi.

In this study, it was found that the majority of patients were from low socioeconomic class. The clinical presentation of the patients studied in our retrospective analysis was similar to the descriptions in previous reports [4,5]. The common symptoms and signs of LA in our study were fever followed by pain and tenderness in the right upper quadrant of the stomach. It is also an important cause of fever of unknown origin. Coexisting diarrhea occurs in 15.8% of patients, and it is extremely rare to find amoebic trophozoites in the stool examination [4]. Reed *et al.*, in 2001, studied amoebic LA and found that the most common clinical features were epigastric and the right hypochondriac pain followed by nausea and vomiting [5].

The majority of patients were middle-aged males falling into the age group of 30–40 years and the male to female ratio was 24:1. Mehta *et al.* in their study reported a male preponderance of 15:1 [6]. In a study by Lee *et al.*, the patients were mainly in 30–50 years age group with a range of 21–79 years [7]. The age predisposition and gender differences may be as a result of high alcohol intake by the young male which predisposes to amoebic LA. Alcohol suppresses the function of Kupffer cells (specialized macrophage) in the liver which has an important role in clearing amoeba [7]. A high content of iron in the diet, often obtained from the country liquor in habitual drinkers predisposes to invasive amoebiasis, as does a diet rich in carbohydrate [8].

In our study, 88.4% of the abscesses were located in the right lobe of the liver which is similar to the finding of previous studies [9–13] and 2.5% of our patients had solitary abscesses, similar to a previous report [4]. The type of abscess was determined on the basis of amoebic serology and pus culture reports. In our study, we found 29.1% of the abscesses to be amoebic in etiology, 50.9% to be pyogenic, 12% to be indeterminate, and 8% to be amoebic with secondary bacterial infection. Bugti *et al.* in their series reported 68% amoebic, 21% pyogenic, 8% indeterminate, and 3% mixed LA [14]. The pus cultures were negative in 42 of 120 patients in the present study. Aerobic cultures were declared negative after 48 h of incubation. There were 8 patients (12%) in whom the amoebic serology, as well as pus cultures, were negative; this might explain the finding of 12% cases with indeterminate etiology.

Pyogenic LA which used to be mainly tropical in location is now more common due to increased biliary interventions or underlying biliary pathology, perforated appendicitis, and diverticulitis. However, the recent trend is toward the increase in

the frequency of patients with cryptogenic [15]. Several reports relate organ abscesses to oral infections, poor oral health, and dental interventions, or oral prophylaxis. Systemic pathogen distribution led to the LA. *Streptococcus anginosus* group organisms are frequently encountered in purulent infections of the mouth and in dental abscesses [14]. The pathogenesis of pyogenic LA possibly could be due to the blood-borne bacteria reaching the liver either by way of the portal vein, biliary tree or hepatic artery or by direct extension from infection in adjacent organs [16,17]. Pyogenic LA in which no specific lesion predisposes to pyogenic LA could be identified even after a detailed search [4]. The majority of samples for abscess cultures were sterile (83%). This could be attributed to the early use of empirical antibiotics in the present study.

Intravenous antibiotics were given to all the patients, and this was the only treatment for 9 patients (12%). The most commonly used antibiotics were third-generation cephalosporins with metronidazole. If antimicrobial sensitive antibiotics are given for 4–6 weeks; according to the cultured microorganism, it can be curative for abscesses measuring <5 cm in diameter. [9]. Ultrasound-guided pig-tail catheterization was done in 81 patients (67%). Percutaneous needle aspiration in combination with systemic antibiotics is safe and effective treatment, and it should be considered as first-line treatment [9]. Surgical exploration and open drainage of the LA were performed in cases presenting with intraperitoneal rupture of LA. Three patients underwent open drainage and for one case, we did a laparoscopic drainage. In a study by Bugti *et al.*, the surgical intervention was performed in 7.14% of the patients which was slightly higher as compared to our study [14].

In summary, our study includes 120 cases of LA. The most common age group affected by the LA was the third and the fifth decade and males were more commonly affected than females. The most common presenting symptom was right upper abdominal pain followed by fever with chills. Percutaneous drainage (pigtail) is considered as the best modality of treatment for the LA.

CONCLUSION

Ultrasonography is the standard modality for diagnosis as well as therapeutic drainage of the abscess. We found that the incidence of the pyogenic LA was more as compared to amoebic LA. The most common pathogen responsible for pyogenic LA was *Escherichia coli* followed by *Klebsiella* and alcoholism remain an important risk factor. Ultrasound-guided percutaneous pigtail catheter drainage is a superior therapeutic approach than percutaneous needle aspiration in case of multiple abscess cavity.

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