

Original Research Article

Effectiveness of percutaneous treatment and intravenous antibiotics with significantly improved outcomes in patients of amoebic and pyogenic liver abscess

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ABSTRACT

The study emphasizes the effectiveness of percutaneous treatment of liver abscess along with intravenous antibiotics which significantly improved outcome in patients. However in pyogenic and amoebic liver abscess patients having comorbidities like DM or complications like rupture the hospital stay duration, cost of treatment and morbidity was longer.

Result

Image guided drainage was done in 112 patients (93%). Open surgical drainage (Exploratory laparotomy) was done for 6 cases (5%). Medical treatment (Antibiotic alone) was given to 2 patients (2%).

Duration of i/v antibiotics treatment for less than one week was for 45 (37.5%) patients out of 120 patients and those who require more than one week i/v antibiotics treatment were 75 patients (62.5%).

From this study we identified the following independent factors affecting the prognosis of patients with liver abscess with respect to duration of treatment, cost of treatment and disability adjusted life years due to morbidity - Jaundice (Hyperbilirubinemia), diabetes mellitus, leukocytosis, Hypoalbuminemia, increased SGOT, increased SGPT, uremia, large size of abscess, multiple liver abscesses, hepatomegaly and presence of complication that is ruptured liver abscess.

Conclusion

In recent scenario, we mainly treat pyogenic and amoebic liver abscess with a combination of parenteral antibiotics and percutaneous drainage with/without pigtail catheter. Patients who are treated with antibiotics only are the ones having an abscess cavity less than 5cm. In pyogenic and amoebic liver abscess patients having jaundice (hyperbilirubinemia), diabetes mellitus, increased SGOT, increased SGPT, uremia, large size of abscess, multiple liver abscess, hepatomegaly, and ruptured liver abscess, the hospital stay duration, cost of treatment and morbidity was longer.

Keywords: Liver abscess

Study Design: Prospective study

1. Introduction

Liver abscess is a common problem in India and is associated with high morbidity and mortality. During the course of illness, one-third of the patients may develop clinical jaundice. The risk factors for high prevalence of liver abscess in India are poor sanitation, overcrowding and inadequate nutrition[1].

Liver abscess is a well circumscribed region of dead hepatocytes, liquefied cells, and cellular debris. Varying degrees of biliary damage have also been reported in patients with amoebic liver abscess. Vascular injury caused by hepatic necrosis is expected in these patients to result in bilio-vascular fistula[2]. As a result, a mixture of bile and blood may accumulate in the damaged area of the liver and be diverted toward the low-pressure area. Clinical manifestations of biliary-vascular fistulas depend on the pressure gradients between the vascular system and the biliary tract.

Liver abscess is classified as those of bacterial origin (pyogenic liver abscess) and caused by *Entamoebahistolytica*. Pyogenic liver abscess is on the verge of rise. Major cause for the pyogenic abscess is biliary tract diseases. In alcoholics, diabetics and immuno-compromised individual there is an increasing trend of the disease[3]. It is of grave importance as these subsets of patients also have more complications, morbidity and mortality. In general, portal, traumatic, and cryptogenic hepatic abscesses are solitary and large, while biliary and arterial abscesses are multiple and small.

Pyogenic liver abscesses are the most common liver abscesses and has been recognized since the time of Hippocrates. Pyogenic liver abscess is caused by development of intra-hepatic pus collection secondary to a local inflammatory reaction by bacterial infection in hepatic parenchyma. The main symptoms are abdominal pain-mainly in the right hypochondrium - fever and hepatomegaly. It has a subacute evolution with symptoms varying between 3-120 days[4].

They may be single or multiple and are more frequently found in the right lobe of the liver. The abscess cavities are variable in size and when multiple, may coalesce to give a honeycomb appearance. The most common infecting agents are gram-negative bacteria. *Escherichia coli* is found in two thirds of cases, and other common organisms include *Streptococcus faecalis*, *Klebsiella*, and *Proteus vulgaris*. Anaerobic organisms such as *Bacteroides fragilis* are also seen frequently. In patients with endocarditis and infected indwelling catheters, *Staphylococcus* and *Streptococcus* species are more commonly found. In the past, pyogenic liver abscesses often resulted from infections of the intestinal tract such as acute appendicitis and diverticulitis, which then spread to the liver via the portal circulation. With improved imaging modalities and earlier diagnosis of these intra-abdominal infections, this particular etiology of pyogenic liver abscesses has become less common. Pyogenic liver abscesses also occur as a result of impaired biliary drainage, subacute bacterial endocarditis, infected indwelling catheters, dental procedures, or the direct extension of

infections such as diverticulitis or Crohn's disease into the liver[5]. There appears to be an increasing incidence due to infection by opportunistic organisms among immunosuppressed patients, including transplant and chemotherapy recipients as well as patients with acquired immunodeficiency syndrome (AIDS). Due to the advent of newer sophisticated imaging modalities, early diagnosis and precise localization of pyogenic liver abscess can be achieved. Now-a-days, image guided percutaneous aspiration and drainage of abscess along with new generation of IV antibiotics has largely replaced more invasive surgical treatment as the first line therapy for pyogenic liver abscess.

2. Materials and Methods

The present study was conducted as a prospective study, involving 120 patients who were admitted in male and female surgical wards, Department of General surgery, J.A. Group of hospitals and G.R. Medical College, Gwalior during the period January 2019 - January 2020 after taking well informed written consent from the patient.

Study design: prospective

Study area: Department of General surgery, J.A. Group of hospitals and G.R. Medical College, Gwalior

Study duration: 12 months i.e. from January 2019 - January 2020 after taking well informed written consent from the patient.

Study population: 120 patients who were admitted with diagnosis of liver abscess in male and female surgical wards, Department of General surgery.

INCLUSION CRITERIA:

- Age more than 15years.
- Well Informed and written consent duly signed by patient and their attendants.
- All cases in evolving, liquefied and ruptured stage with or without peritonitis
- All cases evolving, liquefied and ruptured stage with or without peritonitis

EXCLUSION CRITERIA:

- Patients having age less than 15years.
- Patients with neurological symptoms.

3. Result

Table 1: Solitary or multiple in patients with pyogenic liver abscess

	No. of Patients	Percent
Single	101	84
Multiple	19	16
Total	120	100

Single abscess cavity was present in 101 patients (84%) while 19 patients (16%) had multiple abscess cavities.

Table 2: Size of the liver abscess in patients with pyogenic liver abscess

Size	No. of Patients	Percent
< 5 cm	01	0.83
5-10 cm	87	72.5
> 10 cm	32	27
Total	120	100

Notably in 87 patients (72.5%) abscess cavity size was between 5- 10 cm and 32 patients (27%) had size > 10 cm while only 1 patient had < 5 cm of abscess cavity size.

Table 3: Laboratory studies in patients with pyogenic liver abscess

Lab studies	No. of Patients	Percent
WBC > 1000/mm ³	77	64
Serum albumin < 35 g/l	110	92
SGOT > 40 IU/l	73	61
SGPT >40 IU/l	63	52
Serum total bilirubin > 1 mg%	90	75
Blood urea nitrogen > 45 mg%	31	25
Serum creatinine > 1.4 mg%	29	24
Prothrombin time (>13.5 s)	90	75
Alkaline Phosphatase (>140IU/L)	70	59

The most common laboratory finding was low serum albumin which occurred in 110 patients (92%) followed by leukocytosis in 77 patients (64%) increased SGOT in 73 patients (61%) and increased SGPT in 63 patients (52%). Total bilirubin was elevated in 20 patients (16%). Notably 100 patients (84%) had normal serum bilirubin level.

In our study lowest serum bilirubin was 0.33 mg/dl and highest bilirubin was 4.5 mg/dl.

Out of 84 alcoholic patients, 15 patients had hyperbilirubinemia and out of 36 non-alcoholic patients 01 patient had hyperbilirubinemia.

Table 4: Modes of Management in patients with pyogenic liver abscess

Mode of management	No. of Patients	Percent
Medical	2	1.67
Image guided drainage	112	93.3
Surgical drainage	6	5
Total	120	100

Image guided drainage was done in 112 patients (93.33%), surgical drainage was done in 6 patients (5%) whereas medical management was done in only 2 patients (1.67%)

Table 5: Duration of IV Antibiotics

Mode of management	No. of Patients	Percent
<1 week	45	37.5
> 1 week	75	62.5

Out of 120 patients, 45 patients (37.5%) received IV antibiotics for < 1 week and 75 patients (62.5%) received IV antibiotics for > 1 week.

4. Discussion

Liver abscess is a common disease in today's scenario. Incidence is expected to rise due to ageing population, increasing number of immunocompromised patients with chronic illnesses and increased detection with newer imaging techniques. Over the past few decades, we observed changing trends in etiology, diagnosis, bacteriology, treatment and outcomes of patients[6].

The most common organism isolated from blood and abscess aspirate was enterobacteriaceae (E-coli followed by Klebsiella and Anaerobes). This is probably explained by high incidence of biliary cause of liver abscess.

Intravenous empirical antibiotics give adequate coverage for these organisms. Reports from literature suggest that antibiotics alone, when administered for 4-6 weeks can be curative for a solitary abscess less than 5 cm in diameter, if a diagnostic USG guided aspiration is also done to ascertain the diagnostic and determine the antimicrobial sensitivity of the culture micro-organism[7]. Intravenous antibiotics were given to all the patients. The most commonly used antibiotics were third generation IV cephalosporin with metronidazole. This regimen covered most of the identifiable organisms and has similar to regimens used in other centres. For patients with community acquired liver abscess, the more effective regimen for empirical therapy is Amoxicillin - Clavulanic acid or Ampicillin - Sulbactam plus metronidazole to cover the usual bacteria (Enterobacteriaceae, Bacteroides spp., Enterococci) and possible Entamoebahistolytica. Cefuroxime and metronidazole is an alternative choice. Early diagnosis with prompt institution of treatment is pivotal in successful therapy. The development of and sophisticated radiological imaging techniques have revolutionized the management of liver abscess[8].

In this study of 120 patients increased bilirubin was observed in 90 patients (75%), increased SGOT in 61%, increased SGPT in 52%, lowered serum protein level in 92% cases. These above mentioned derangements of liver function markers lead to greater morbidity and lead to increased hospital stay duration to patients. Most of the patients presenting in our institution were males (male: female ratio 5:1). Right upper quadrant pain (96.6%) was the most common presenting symptom followed by fever (77%). There is a strong relation in patients with liver abscess and history of alcoholism (present in 70%). 110 patients had low serum proteins while 14 patients had normal WBC count and 131 patients had normal serum bilirubin. Patients having such non-specific clinical

presentations poses a challenge for diagnosis and needs a high index of suspicion[9].

Based on classic work by Ochsner et al in 1938, open surgical drainage had been the recommended treatment historically. However such an invasive technique requires general anaesthesia and was associated with surgical morbidity and mortality up to 70% in those times[10]. McFadzean et al in Hong Kong reported the first experience of closed aspiration and antibiotic treatment of solitary liver abscess in 1953[11]. In their series, 14 patients underwent direct aspiration and antibiotics were immediately added to the cavity after irrigation. All patients had uncomplicated recovery. That report was largely ignored until 2 decades later. However with development of ultrasonography and CT scan, image guided drainage of liver abscess coupled with antibiotics is preferred treatment these days. In this series, image guided drainage was done in 112 patients (93.3%). Surgical drainage was required for only 6 patients (5%) while 2 patients (1.67%) were managed by antibiotics alone.

In this study, we could identify septicemia, hyperbilirubinemia, uraemia, increased size, deranged LFT, multiple abscess, ruptured liver abscess, emergency laparotomy and presence of comorbidities such as CCF, diabetes mellitus, IHD and stroke as important risk factors for poor outcome, morbidity and mortality in patients with pyogenic liver abscess consistent with studies in past.

5. Conclusion

In recent scenario, we mainly treat pyogenic and amoebic liver abscess with a combination of parenteral antibiotics and percutaneous drainage with/without pigtail catheter. Patients who are treated with antibiotics only are the ones having an abscess cavity less than 5cm. In pyogenic and amoebic liver abscess patients having jaundice (hyperbilirubinemia), diabetes mellitus, increased SGOT, increased SGPT, uremia, large size of abscess, multiple liver abscess, hepatomegaly, and ruptured liver abscess, the hospital stay duration, cost of treatment and morbidity was longer.

6. References

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