



PROSPECTIVE STUDY OF ETIOLOGY OF LIVER ABSCESS AND COMPARISON OF DIFFERENT WAYS OF ITS MANAGEMENT

General Surgery

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ABSTRACT

Background: Liver abscess is a collection of purulent material in the liver parenchyma which can be due to bacterial, parasitic, fungal or mixed infection. It has become one of the most common communicable disease with much more prevalence in underdeveloped and developing countries. Two most common type of liver abscess are amoebic and pyogenic. Pyogenic liver abscess is more common in western world while amoebic liver abscess is more commonly found in third world countries, which are under developed, and more people living under lower socio economic conditions.

Methods: A prospective study of 50 patients with clinical diagnosis of liver abscess admitted in the department of General Surgery JLNMC Bhagalpur during a period of one year.

Results: There was male predominance (98%) and most of the patient belongs to younger age group and low socio economics status. In amoebic liver abscess there was strong correlation with toddy intake and alcohol (66%).

Conclusions: In our study most of the patients were group 21-30 years and the most common presenting symptom was right upper quadrant pain and fever. In most of the patients, the common hematological finding was mild anaemia with leucocytosis with altered LFT.

KEYWORDS

Amoebic, Aspiration, Coagulation profile, Leucocytosis, Pigtail, Pyogenic

INTRODUCTION

Liver abscess are cystic, space occupying lesion within liver parenchyma. The liver is bathed with portal blood containing bacteria, parasites, ova and other antigen.¹ It is the most common intra-abdominal visceral abscess.² It is a collection of purulent material in liver parenchyma which can be due to bacterial, parasitic, fungal or mixed infection.³ It has become one of the most common communicable disease with much more prevalence in underdeveloped and developing countries.² Two most common abscess being pyogenic and amoebic.¹

Pyogenic liver abscess is more common in western world while amoebic liver abscess is more commonly found in third world countries, which are under developed, and more people living under lower socio economic conditions. Commonly known etiology of pyogenic liver abscess are biliary infection, portal vein seeding, direct extension, hepatic artery seeding, penetrating trauma and cryptogenic causes. Solitary lesion in right lobe of liver is more common than multiple abscess cavity in a single lobe or both lobe involvement.

Amoebic liver abscess is the most common extra intestinal form of invasive amoebiasis. *Entamoeba histolytica* and *Entamoeba dispar* are the two species of amoeba that infect humans. *E. dispar* remains asymptomatic while *E. histolytica* is the parasite responsible for all form of invasive disease.² It affects about 500 million people worldwide. The highest rates of infection with *E. histolytica* are seen in India, Africa, Mexico, Central America and South America.⁴ Amoebic liver abscess transmit through faeco-oral route. Low socio economic condition, unsanitary habits, immunocompromised state and toddy and alcohol abuse are significant risk factor for amoebic liver abscess.²

Although no distinct clinical criteria exist for distinguishing the two types, the diagnosis of amoebic and pyogenic abscess can be made by following points-younger age, resident or recent travel to areas of endemic amoebiasis, diarrhea and marked abdominal pain raise clinical suspicion of amoebic liver abscess. The diagnosis is confirmed by ultrasonography, serological tests like indirect hemagglutination tests, reddish brown (anchovy-paste like material) aspirate from abscess, with negative gram stain, rapid resolution after metronidazole treatment. The diagnosis of pyogenic liver abscess is made by symptoms of picket fence configuration of temperature chart, nausea, vomiting and anorexia. Pain is late symptom and is more common with

large solitary abscesses. Investigation reveal leucocytosis, anemia and positive blood culture for bacteria.

The diagnosis and treatment and prognosis of liver abscess have evolved remarkably over past years. Radiological imaging has improved diagnostic competence and has altered therapeutic strategy by allowing the possibility of percutaneous drainage. Rapid diagnosis, effective antimicrobial therapy, treatment of underlying disease, and orderly approach to therapeutic interventions directed towards the abscess remain the mainstay of care for the patients with hepatic abscesses. The concept of minimally invasive drainage has been and continues to be of paramount importance in treatment of hepatic abscesses.

METHODS

This was prospective study on patient of liver abscess admitted in the department of surgery. The material for this study were collected from 50 patients of liver abscess admitted as indoor patients in the department of General surgery, JLNMC BHAGALPUR during a period of one year from March 2019 to February 2020.

Sample size and design

First 50 patients with different type of liver abscess admitted in surgery ward and subjected to laboratory and radiological investigations.

Study design

Prospective, non randomized, comparative study.

Procedure ethical approval

From ethical committee of JLNMC Bhagalpur, ethical approval was taken.

Statistical analysis

All categorical variables are reported as number (%) compared across groups using Chi-square test for independence of attributes.

An α level of 5% has been taken and hence any p value <0.05 has been taken as significant.

Inclusion criteria

Primary- patients suggestive of having liver abscess on the basis of history, clinical assessment; confirmatory- on USG and laboratory work up (raised alkaline phosphatase, and other liver function test).

Exclusion criteria

Patients not having clinical and radiological feature of liver abscess are excluded from study; patient with recurrent liver abscess; patient with ruptured liver abscess; patient who underwent open surgical procedure for liver abscess.

Parameter to be studied

Age; sex; occupation; address; socioeconomic status; addiction; complete haemogram; liver function test; USG feature; culture of aspirated material from liver abscess; gram staining of aspirate; treatment modalities; treatment outcome

Study tools

Pretested and predesigned proforma- proper history taking, clinical assessment; radiology- USG, chest X-ray, CT scan only if USG is inconclusive; biochemical- CBC, LFT, HBSAg, HIV, HCV, gram staining and culture of aspirated abscess fluid; statistic of outcome of different type of management.

Methodology

The patient in the study were subjected to a complete physical examination including thorough examination of abdomen and chest following proper history. Specific investigation including complete haemogram, liver function test, prothrombin time, blood sugar, ultrasound of abdomen, chest X-ray, microscopic examination and culture of aspirated pus.

Management

Medical management; USG guided percutaneous needle aspiration; USG guided catheter drainage.

Outcome was assessed by: relief of right hypochondriac pain; resolution of liver abscess cavity ultrasonographically at third day after particular treatment started; improvement of symptom at third day of particular treatment and; decrease in total leucocyte count at third day after particular treatment started.

RESULTS

Age distribution

The age of patient in the study range from 10 years to 80 years.

The majority of patient were in age group 21-30 years (34%), followed by 41-50 years (24%), followed by 31-40 years (20%) patients above age of 70 years were having least incidence (2).

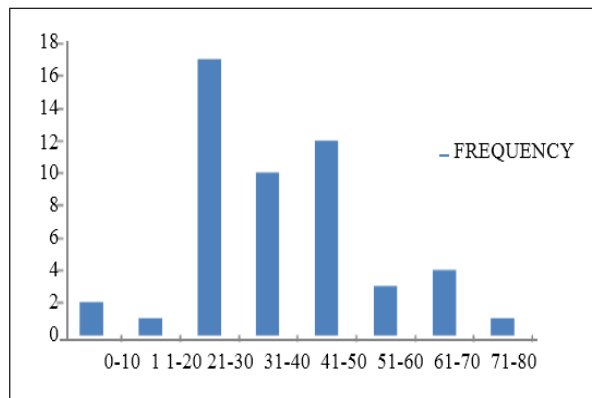


Figure 1: Age group distribution.

Case distribution according to socio-economics status

Majority of patient 40 out of 50 belong to lower socio-economics status (80%) followed by middle socio-economics status 8 out of 50 (16%) and least common being upper socio-economics status 20 out of 50 (4%)

Case distribution according to clinical feature

Right upper quadrant pain was commonest clinical feature in all 50 patients (100%), followed by fever 39 out of 50 (78%), followed by hepatomegaly in 38 out of 50 patients (76%), icterus in 19 out of 50 (38%), chills and rigour 16 out of 50 patients (32%).

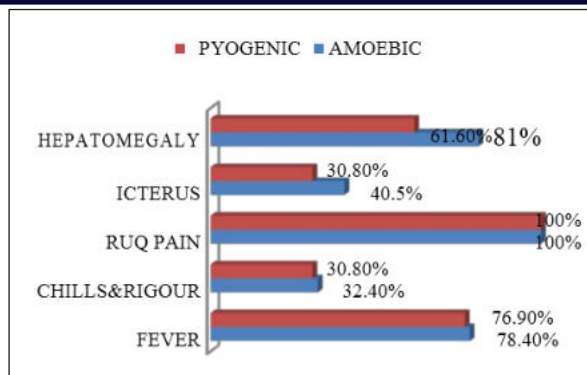


Figure 2: Clinical features.

Case distribution according to total bilirubin

Majority of patients 35 out of 50 (70%) were having serum bilirubin level below 2.0 and only 15 out of 50 (30%) were having serum bilirubin level above 2.0.

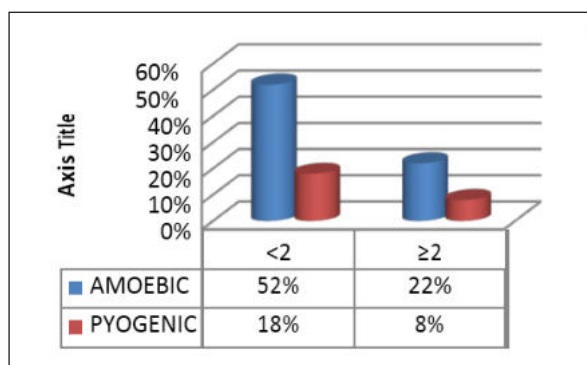


Figure 3: Total bilirubin.

Case distribution according to site of abscess

There was right liver lobe predominance in majority of patient 34 out of 50 (68%) followed bilobar involvement 10 out of 50 (20%) and least common being isolated left lobe involvement 3 out of 50 (6%).

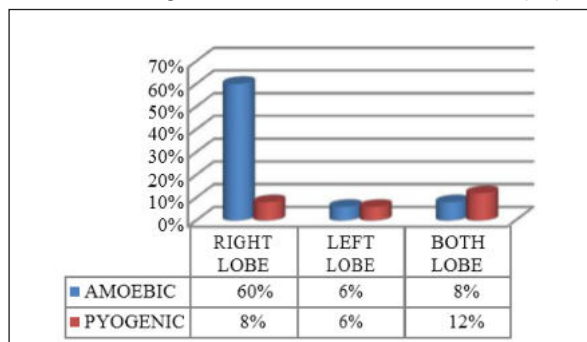


Figure 4: Site of abscess.

Case distribution according to type of abscess

Majority of patient in the study were followed to having amoebic liver abscess 37 out of 50 (74%) than pyogenic liver abscess 13 out of 50 (26%).

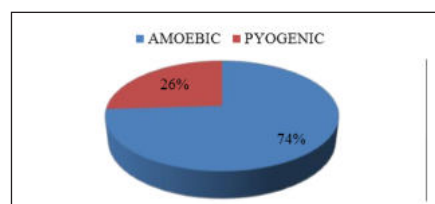


Figure 5: Type of abscess.

Case distribution according to level of anaemia

43 out of 50 patients (86%) were mildly anaemic (Hb=9-14) and out of 50 (14%) patients were moderately anaemic none of the patients in our study was severely anaemic (Hb<7).

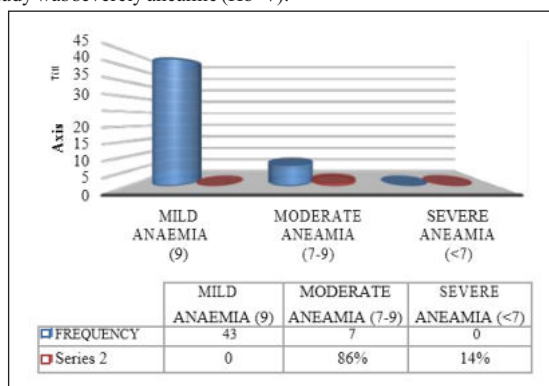


Figure 6: Hemoglobin.

Case distribution according to TLC

44% of patients (22 out of 50) were having TLC >11000 out of which 32% belong to amoebic and 12% belong to pyogenic type 56% of patient (28 out of 50) were having TLC <11000 out of which 42% belong to amoebic and 14% belong to pyogenic type.

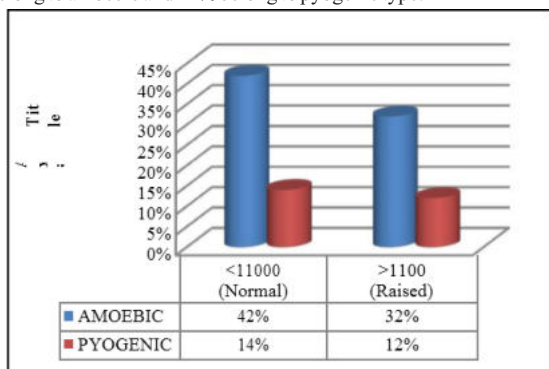


Figure 7: TLC.

Case distribution according to PT/INR

Out of 50 cases, only 12 cases (24%) presented with high PT/INR (>15 seconds) rest 76% cases were with PT/INR <15 seconds.

Case distribution according to treatment

Out of 50 patients, 34 patients (68%) undergone pigtail catheter insertion, out of which 56% of cases were amoebic type and 12% cases were pyogenic type 14 patients (28%) managed by conservative treatment without any instrumentation out of which 16% were of amoebic type and 12% were of pyogenic type 2% undergone USG guided aspiration out of which one patient was of amoebic type and one patient was of pyogenic type.

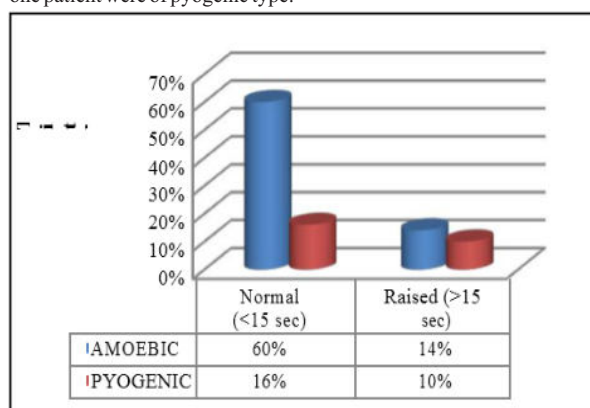


Figure 8: PT/INR.

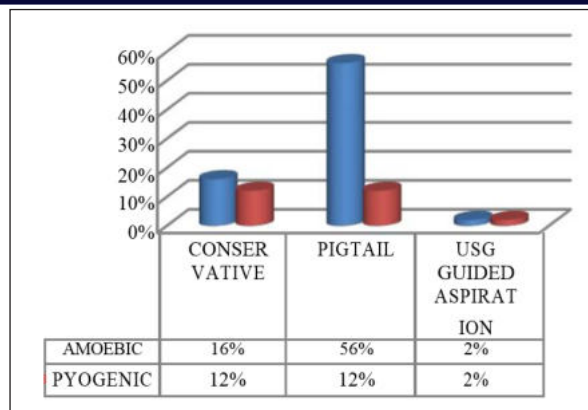


Figure 9: Treatment.

Outcome analysis

In our study of 50 cases of liver abscess, best outcome was found by in patient of pigtail catheter insertion followed by conservative management followed by USG guided aspiration.

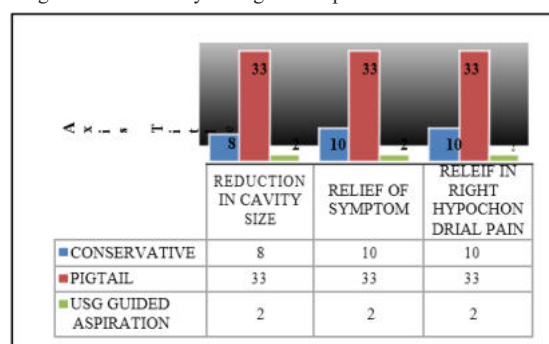


Figure 10: Outcome analysis.

DISCUSSION

The present study was conducted in JLNMC Bhagalpur. First 50 patients admitted in surgery ward with clinical, laboratory and radiological feature suggestive of liver abscess were chosen.

In our study most of the patient were in age group 21-30 years (34%) and mean age of the study was 38.12 years which was near to studies done by, Ghosh et al, Sharma et al and Mukhopadhyay et al who reported it to be 41.13, 40.5 and 43.64 years, respectively.⁵⁻⁷

As far as sex predisposition was concerned, after recruiting 50 patients, only 01 patient was females. Sharma et al, Mukhopadhyay et al, Jha et al reported male to female ratio to be 7:1, 11:1, 101:9 respectively.⁶⁻⁸ However, Pang et al and Heneghan et al reported it to be 2:1 and 1.22:1, respectively which was done for pyogenic liver abscess.^{9,10}

In the study 80% (n=40) cases of liver abscess consume alcohol regularly, out of which 66% (n=33) were having ALA and only 14% (n=7) were having PLA. Similar findings were observed by Ochsner et al and attributed higher incidence of alcoholism in males, alcohol suppress function of Kupffer cells (specialized macrophage) in liver which has important role in clearing amoeba.¹¹ In present study; most common presenting symptom were right upper quadrant pain and fever with frequency of 100% and 78% respectively. Singh et al in similar study found that 64, 3% of ALA patient present with right upper quadrant pain.¹²

Out of 37 ALA patients 78.4% present with fever and out of 13 patients with PLA 76% presented with fever. Ghosh et al reported fever in 99% of his cases while other studies quote it in range of 62-94%.⁵⁻⁷ Fever pain abdomen were seen in 94%, 90% respectively by Sharma et al.⁶

Other common symptom in our study was hepatomegaly present in 76% (n=50) cases. Out of total ALA patient 81% (n=37) present with hepatomegaly and 61.6% of PLA (n=13) patient present with hepatomegaly. Ghosh et al reported hepatomegaly in 89% cases, Das et

al found it in 72% cases, 70% by Siddique et al whereas it was 16% as reported by Sharma et al.^{6,7,13,14}

Anorexia was another significant symptom present in 66% cases, while Ghosh et al reported it to be 93%.⁷

Other symptoms such as chills and rigour present in 32% of cases, which was near to Christopher et al study who found only chills in 41.42%.¹⁵ and Kempraj et al who found chills rigour in majority of cases i.e., 67%.³ Icterus in 38% while Kampraj et al found icterus in 20% cases and Maheshwari et al in 16% cases.^{3,16}

The blood investigation reveal mild anaemia to be present in 86% cases and moderate anaemia in 14% of cases, which was way higher due to small sample size when compared with Jha et al who reported it to be present in 52% cases whereas it was present in 66% cases in the study done by Siddique et al.^{8,14}

Leucocytosis is observed in 44% of patients in the present study. Ghosh et al reported patients with leucocytosis in 82% cases, whereas it was 70% by Tiwari et al and 80% by Rajak et al.^{7,17,18} Khan et al showed 26.7% polymorphonuclear leucocytosis.¹⁹

Liver function tests were performed in the present study to estimate the levels of liver enzymes that acts as indicators of liver function. Results revealed that the levels of alkaline phosphatase were raised in 28% patients, total bilirubin raised in 30%. Ghosh et al reported it to be 79% and 27% respectively and Jha et al reported it to be 62% and 43% respectively.^{7,8}

PT/INR>15 seconds was recorded in 24% cases in this study. Patients with deranged INR were treated with a dose of vitamin K 10 mg i.m. and then transfusion of fresh frozen plasma done if required. Abnormal INR was 43% reported by Jha et al.⁸

In concern with radiological findings, solitary abscesses were seen in 42% patients and multiple abscesses in 58% patients. Likewise, 60% solitary abscess were found in a study by Ghosh et al, 68% by Tiwari et al, 80% by Rajak et al, 79% by Sharma et al while multiple abscess were found 30% by Trivedi et al and 25% by Sharma et al.^{6,7,17,18,20}

Right lobe was involved predominantly 68% while Huges et al, Trivedi et al and Hoffnr et al had reported in 60%.²⁰⁻²² cases and 82.4% by Nasar et al with right lobe involvement.²³

We reported treatment of patients by pigtail insertion in 70% (n=34) patients, medical management alone in 28% (n=14), 4% (n=2) by USG guided aspiration. Christopher et al reporter 40% cases with antibiotics alone, 21.42% cases were treated with antibiotics and aspiration 38.57% cases were subjected to catheter drainage.¹⁵

In our study 74% of patients were found to give amoebic liver abscess and 26% of patients were found to have pyogenic liver abscess. Oschner and colleagues reporter in 1938 that amoebic liver abscessis three times more common than pyogenic liver abscesses.¹¹ Improvement in public sanitation and hygiene led to a decrease in cases of amoebiasis and amoebic liver abscess. Currently, pyogenic liver abscesses make up the majority of hepatic abscesses in western literature.¹⁴ In developing countries including India though number of pyogenic abscesses is increasing due to predisposing hepatobiliary disorder, the amoebic type still constitutes the majority. The study carried out by Singh et al showed that 67% patients had amoebic subtype.¹² So our result corroborates with their result that amoebic liver abscess is more prevalent than pyogenic liver abscess.

Irrespective of the procedure done it has been seen in our study that 86% of the subjects attained $\geq 50\%$ reduction in abscess cavity size following treatment and 90% get relief from symptom and relief in right hypochondrial pain.

In our study out of total, 28% (n=14) treated conservatively with medical therapy shows of which 57.14% (n=8) shows reduction in cavity size and 71.4% (n=10) shows relief of symptom and relief in right hypochondrial pain. About 68% (n=34) of patients treated with pigtail drainage, of which 97% (n=33) of them attained reduction in cavity size, relief of symptom and relief in right hypochondrial pain.

CONCLUSION

In present study 98% patient were male and most common age group effected was 21-30 years, about 80% of the patient belong to low socio economic status.

Commonest present symptom was right upper quadrant pain (100%) followed by fever (78%). Hepatomegaly was found in 76% of patient and icterus was present 38% of cases. In our study 74% of patient were of amoebic liver abscess and 26% of patient were of pyogenic liver abscess. Toddy and alcohol intake was associated in 68% of the amoebic liver abscess and 14% in pyogenic liver abscess. 80% of the patient present with raised AST and ALT. Right lobe of liver was the site of liver abscess in 68% of cases. 58% of patient presented with multiple liver abscess. On hematological investigation review 86% of patient mildly anemic, 22% have raised TLC, 24% have raised PT/INR. Most common method used for treatment was pigtail drainage (68%) and only 4% of cases were USG guided aspirated and rest were managed conservatively.

Pigtail drainage treated patient show good outcome with 97% reduction in abscess cavity size with relief in symptom. Patients treated conservatively show average outcome with 57% reduction in cavity size with relief in symptoms.

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