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RESEARCH ARTICLE

ETIOLOGY AND CLINICAL PRESENTATIONS OF LIVER ABSCESS IN A TERTIARY CARE HOSPITAL, IMPACT OF VARIOUS FACTORS ON OUTCOME IN PATIENTS UNDERGOING PERCUTANEOUS DRAINAGE VERSUS PATIENTS ON CONSERVATIVE MANAGEMENT FOR LIVER ABSCESS

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ABSTRACT

Background: A liver abscess is defined as pus-filled mass in the liver that can develop from injury to the liver or an intraabdominal infection disseminated from the portal circulation liver abscess is caused by agents such as *Entamoeba histolytica*, *Escherichia coli* and *Klebsiella pneumonia, staphylococcus aureus, streptococcus pyogenes, enterococcus faecalis*. Clinical presentation of liver abscess include right upper quadrant pain, fever, cough, malaise, weight loss, anorexia, Jaundice, and abdominal pain with hepatomegaly. The diagnosis of liver abscess is made by radiographic imaging of the liver, stool microscopy, evaluation of liver abscess fluid, amoebic Serology.USG and (CT) scan are the diagnostic modalities used for identification of liver abscess. Treatment of liver abscess were antibiotic, antiamoebicand USG-guided percutaneous pig tail catheter drainage. ***Materials and Methods****:* This was a prospective observational study conducted in tertiary care centre in north india over a period of one year. Data was collected on a structured questionnaire by interview method from patients admitted in wards, intensive care unit of the family medicine department fulfilling inclusion and exclusion criteria. Patient with age greater than 18 years of age with clinical features, laboratory investigations, and ultrasound evidence of liver abscess were included in study written informed consent from patient was obtained. Pregnant females, Concomitant biliary tract malignancy, uncorrectable coagulopathy were excluded from study. ***Results:*** A total of 101 hospitalized acutely ill medical patients, who met the inclusion criteria were selected for study. Patients were prospectively followed till the discharge from hospital. To study the etiology and clinical presentation of liver abscess in a tertiary care hospital, Impact of various factors on outcome in patients undergoing percutaneous pigtail catheter drainage versus patients on conservative management for liver abscess were analysed. In our study 95 patients (94.05%) out of 101 patients had complaints of abdominal pain. Most common agents seen inpyogenic liver abscess was *Klebsiella pneumoniae, Escherichia Coli*, on analysis of data of 91 patients (90.09%) out of 101 patients. Time taken for clinical improvement with *conservative medical management* is *17.18* day whereas time taken for clinical improvement *with pig tail catheter drainage* were *13.38* days. Duration of stay was more in medical treatment(17.18±2.92) as compared to percutaneous catheter drainage(13.38±1.63), p=0.001 ***Conclusion:*** In our prospective observational study we found that patient who underwent percutaneous catheter drainage had better outcomes compared to conservative medical management. Early intervention with Percutaneous catheter drainage reduces average length of hospital stay and improves recovery.

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INTRODUCTION

(1) Clinical presentation of Amoebic liver abscess include right upper quadrant pain, fever, cough, weight loss, anorexia, Jaundice, weight loss, and abdominal pain with hepatomegaly, Patients with amoebic liver abscess often have a leukocytosis, liver function test shows an elevated alkaline phosphatase and hepatic transaminases (2).Antigenic testing done alone with stool microscopy and evaluation of liver abscess fluid. Serology and antigen detection is found in 99 percent of patients with amoebic liver abscess.

Amoebic liver abscess contain acellular, proteinaceous debris, and a brown fluid likened to "anchovy sauce pus "consisting predominantly of necrotic hepatocytes. Trophozoites are seen on microscopy of the aspirate were present in the peripheral part of the abscess (3). Treatment of amoebic liver abscess consists of a tissue agent and a luminal agent. Patients with amoebic liver abscess treated with metronidazole 500 mg orally three times daily for 14 days. Intraluminal infection can be treated with paromomycin, diloxanide furoate. Chloroquine 600 mg base daily for two days, followed by 300 mg daily for 19 days is an alternative agent to metronidazole for treatment of amoebic liver abscess. Needle aspiration under ultrasound sonography guided, insertion of a pigtail catheter to be used if the cyst size is >5cm in diameter, if there is clinical deterioration or lack of response to empirical therapy, needle aspiration, percutaneous catheter drainage can be therapeutic as well as diagnostic (4). Risk factors include Diabetes mellitus, Hepatobiliary, Pancreatic disease, Liver transplant, Colorectal cancer, Biliary tree stenting, immunosuppression due to cancer chemotherapy (6).liver abscess most commonly involve the right lobe of the liver, than the left lobes. Laboratory result shows derangement in ESR, TLC, SGOT, SGPT, ALP, INR, Albumin, Haemoglobin, Serum Bilirubin (7). Ultrasound sonography and CT scan are the diagnostic modalities typically used for identification of liver abscess(8).CT scan is more sensitive for liver abscess than usg whole abdomen.On ultrasound sonography, pyogenic liver abscess range from hypoechoic to hyperechoic lesions.Most typical finding are well-defined, round lesion with central Hypoattenuation (9).Peripheral rim enhancement, surrounding edema are specific for liver abscess.

Treatment of pyogenic liver abscess were drainage and antibiotic therapy. Drainage of the liver abscess contents be a standard therapy. Drainage should be preferred it was both therapeutic as well as diagnostic (10). For single unilocular abscesses with a diameter > 5 cm-Percutaneous drainage with either catheter placement or needle aspiration, as both result in successful outcomes (11). Drainage catheters should remain in place until drainage became minimal usually ≤10ml/24 hour period. Single, unilocular (LA) with diameter >5cm- percutaneous drainage with placement of a catheter rather than needle aspiration is preffered percutaneous catheter drainage resulted in a higher success rate compared with needle aspiration percutaneous catheter drainage resulted in an earlier clinical improvement and 50 percent reduction in abscess cavity size (12).The decision on drainage approach for multiple liver abscess successfully managed by percutaneous drainage, particularly when the liver abscess are small and easily accessible(13).The empiric regimen should cover *Streptococci*, enteric gram -negative bacilli, and anaerobes. Third generation cephalosporin ceftriaxone plus metronidazole or piperacillin-tazobactam with metronidazole will provide for *E.histolytica* coverage. Antibiotic therapy should be continued for four to six weeks (15).Patients had a good response to initial drainage should be treated with two to four weeks of parenteral therapy (16).

MATERIALS AND METHOD

This was a prospective observational study conducted in a tertiary care centre in north India over a period of one year.

Data was collected on a structured questionnaire by interview method from patients admitted in wards, intensive care unit of the family medicine department fulfilling inclusion and exclusion criteria. Patient with age greater than 18 years of age with clinical features laboratory investigations and ultrasound evidence of liver abscess were included in study written informed consent from patient was obtained. Pregnant females, Concomitant biliary tract malignancy, uncorrectable coagulopathy were excluded from study.

RESULTS

A total of 101 hospitalized acutely ill medical patients, who met the inclusion criteria were selected for study and relevant samples collected and patient specific data were noted. Patients were prospectively followed till the discharge from hospital to study the etiology and clinical presentation of liver abscess. Impact of various factors on outcome in patients undergoing percutaneous catheter drainage versus patients on conservative management for liver abscess were analysed. 11(10.9%) patients were managed conservatively where as 90(89.1%) patient underwent pigtail catheter drainage.

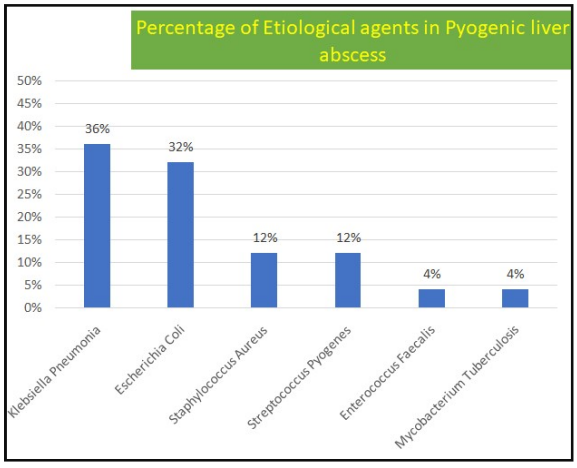

Figure 1. Depicting percentage of etiological agents of pyogenic liver abscess

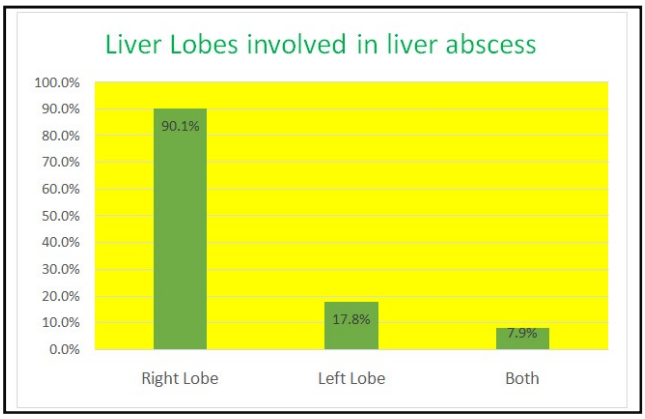

Figure 2. Shows involvement of liver lobes in liver abscess

In our study 95 patients (94.05%) out of 101 patients had complaints of abdominal pain. Pain was localized in the right hypochondrium. There is a strong correlation between liver abscessand abdominal pain.

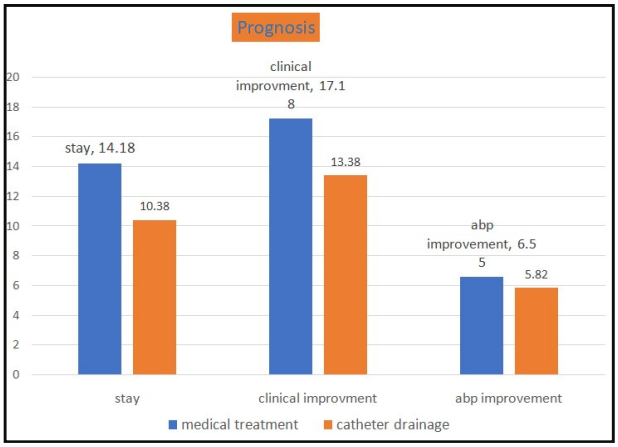

Figure 3. Shows duration of hospital stay, clinical improvement and improvement in abnormal biochemical parameter

Since P-value is greater than 0.05, there is no association between abdominal pain and group.71 patients (70.29%) out of 101 had complaints of loss of appetite, 83 patients (82.17%) out of 101 patients had history of alcoholism. Indicating very strong association between consumption of alcohol and predisposition to liver abscess.59 patients (58.41%) out of 101 patients had hepatomegaly.76 patients (75.24%) out of 101 patients had anchovy sauce pus during drainage. In our study most common agents seen in pyogenic liver abscess is klebsiella pneumonia, Escherichia Coli.

DISCUSSION

The present study was conducted during October 2019 to September 2020 consisting of 101 patients to study etiology and clinical presentation of liver abscess in a tertiary care hospital. Impact of various factors on outcome in patients undergoing percutaneous drainage versus patient on conservative management of liver abscess fulfilling the inclusion criteria was studied.

AMOEBIC LIVER ABCESS VS PYOGENIC LIVER ABSCESS

(18) pyogenic liver abscess due to portal infection, biliary, arterial or traumatic orgin. Ascending infection of the biliary tree secondary to obstruction is now the most identifiable cause of pyogenic liver abscess.(17).Ruptured liver abscess more common in pyogenic liver abscess greater than amoebic liver abscess. Incidence of amoebic liver abscess is 76(75.25%), and pyogenic liver abscess is 25(24.75%).This study shows amoebic liver abscess is more common than pyogenic liver abscess. Majority of liver abscess cases from developing countries were amoebic in etiology. Amoebic liver abscess accounted for more than three-fourth of cases, most of them being solitary right lobe abscess. Multiple abscess were more common in pyogenic liver abscess (6.93%) than amoebic liver abscess (4.95%). In our study we found that males constitutes 77.22% of the study population, female patients formed the remaining 22.77%.This coincides with the literature depicting liver abscess tending to affect younger population especially males as per Sharma *et al* (19). The mean age of patients was *46.41* years.In our study mean length of hospital stay was *12.28* days, male to female sex ratio is 3.71:1. In our study 94.05 % patients had complaints of abdominal pain and 100% had fever as a presenting complaint. In the existing literature pain abdomen and fever is the most common symptoms of liver abscess were present in 99% and 94% respectively (20).Tender hepatomegaly is the most common abdominal examination finding. Most important clinical finding in our study were tender hepatomegaly on right hypochondrium58.41% patient had hepatomegaly. Most of the patient had right hypochondrial pain. Fever was the most symptom seen in liver abscess.34.65% patient had complaint of right shoulder pain.11.88% patient had complaints of diarrhea. Diarrhea in liver abscess could indicate a colonic condition predisposing to liver abscess. 16 % of patient had complaints of cough.69.30% patients had complaints vomiting, 23.76% patients shows jaundice *and* 35.64 % patient had history of diabetes mellitus. Alcohol can predispose to amoebic liver abscess through multiple mechanisms, including hepatic damage by alcohol, lowered body resistance and suppression of liver function due to poor nutritional status of habitual consumers of alcohol. Chest radiograph shows elevation of the right hemidiaphragm, right sided pleural effusion and right lower lobe atelectasis. Similar findings were found in the left thoracic cavity if the abscess involves the left hepatic lobe. In this study 12.9% patient shows raised right hemidiaphragm in chest x ray pa view. Mean value of biochemical parameter such as Haemoglobin is 11.22gm/dl, total leucocyte count is 16.48, mean value of Neutrophil count is 81.85. Neutrophilia is often present with normal eosinophils. Mean value of alkaline phosphatase *240.79*, gamma glutamyl transferase is *110.5* and that of serum glutamic oxaloacetic transaminase is 80.97 and that of serum glutamic pyruvic transaminase is 89.91mean value of Amoebic serology is 19.83.The average value of erythrocyte sedimentation rate in our data analysis is *61.255* and that of C-reactive protein is *9.27*.Etiological agents in positive pus culture, *E.coli-8.5%, Klebsiella pneumoniae 5.5% Staphylococcus 2, Enterococcus 1.5%.*

Examination of drained pus in our study shows 75.24% patient had anchovy sauce pus.24.75% patient shows purulent pus, trophozoites, cyst on drainage of liver abscess amoebic liver abscess showed motile trophozoites of *Entamoeba histolytica* on wet film examination. On analysis of our data 25 patients (24.75%) out of 101 patients had purulent pus during drainage showed bacterial etiology on culture and sensitivity. Liver abscess is determined on the basis of amoebic serology and pus culture reports. Serum samples of all patients were examined for *Entamoeba histolytica*(IgG) antibodies by enzyme linked immunosorbent assay (ELISA). Most frequently isolated bacteria on pus culture were Escherichia coli (44%) followed by *Klebsiella pneumoniae* (33%).Amoebic serology is highly sensitive and specific for the diagnosis of amoebic liver abscess. On USG abdomen shows 90.09% patient had involvement of right lobe of Liver. Solitary liver abscess more associated with amoebic etiology while multiple liver abscess were associated with pyogenic liver abscess. Volume of liver abscess was directly proportional to level of serum alkaline phophatase inversely to haemoglobin.17.82% patient shows involvement of left lobe of liver, 90.09 % involvement of right lobe of liver.86.1% had incidence of solitary liver abscess, 11.9% had multiple liver abscess. The hypoechoic texture were the most common finding observed in most series with a frequency ranging from 80 percent to 90 percent 25.74% patient underwent CT scan examination, 0.99% had MRI scan done.

Medical management is considered in patients at high risk for drainage procedures with small and multiple abscesses less than 5cm in diameter not amenable to drainage. Antibiotic regimen comprise either a third-generation cephalosporin and metronidazole or piperacillin+tazobactam with metronidazole would cover the enterococcal infection also. Ceftriaxone 2 gm IV Twice daily and cefotaxime thrice daily should be used for 3 weeks because of high rate of relapse.Amoebic liver abscess can be treated by metronidazole treatment alone or treated with iv antibiotics, antiamoebic plus percutaneous cutaneous drainage. Inj metronidazole 500mg-750 mg iv thrice daily for 14-21 days, is followed by 2 weeks of Tab.metronidazole 800 mg thrice daily. Amoebic liver abscess treated with a luminal agent Diloxanide furoate or paromomycin to eliminate intestinal colonization by *Entamoeba histolytica*.

Chloroquine 600 mg for 2 days (300 mg twice daily for two days) followed by 150 mg twice daily for 19 days.Liver abscess due to fungal infection such as *Candia Albicans* or other candida species can be treated with, Fluconazole. Lipid formulation of Amphotericin B, Voriconazole, Caspofungin, Anidulafungin, Micafungin. Chronicdisseminated candidiasis occurs in immunosuppressed patients, bone marrow transplant patients .patient not responding to parenteral antibiotics therapy with in 48-72 hours were subjected to ultrasound guided percutaneous catheter drainage for cavity more than 5 cm. In our observational study we found that patient underwent percutaneous catheter drainage with medical management is a better treatment modality compared to conservative medical management alone.The advantage of per cutaneous catheter drainage is it provides a continuous drainage of pus. Imaging guided percutaneous drainage (needle aspiration or catheter drainage) is increasingly used to treat liver abscess with reported success rates ranging from 70 to 100 percent, percutaneous placement of an indwelling catheter is the method most commonly used to drain large liver abscess. Placement of an indwelling drainage catheter addresses all of these issues as it provides continuous drainage, drain thick pus because of wider caliber catheter, and prevent reaccumulation of pus. In our study 5.94% patient shows pleural effusion, 4.95% patient shows complications such as hemorrhage, pleural effusion, empyema, persistent bile drainage, catheter displacement. In our study shows that mean values of, duration of stay, time taken for clinical improvement, and time taken for improvement in abnormal biochemical parameter are different between both the groups. Mean value for duration of stay is more in medical treatment (14.18 ± 2.926) as compared to percutaneous catheter drainage (10.38 ± 1.660), p = 0.001 Mean value for time taken for clinical improvement is more in medical treatment (17.18±2.926) ascomparedto percutaneous catheter drainage (13.38±1.632), p = 0.001 Mean value for time taken for improvement in abnormal biochemical parameter is more in medical treatment (6.55 ± 0.522) as compared to percutaneous catheter drainage (5.82 ± 0.773), p = 0.003. Time taken for clinical improvement from conservative medical management is *17.18* days. Time taken for clinical improvement from percutaneous catheter drainage is *13.38* days.90.09 % involvement of right lobe of liver, 17.82% involvement of Left lobe of liver.86.1% had solitary liver abscess, 11.9% had multiple liver abscess. There is 12.9% patient shows raised right hemi diaphragm in chest x ray pa view.

Two most important clinical finding in our study is raised body temperature and tenderness present over the right hypochondrium. Mean size of liver abscess cavity in our study was 6.84 cm. Mean size of liver abscess volume was 108.19 cc.

CONCLUSION

A total number of 101 cases were included in this study, comprising of patients admitted to wards, intensive care units. Inclusion and exlusion criteria were applied to select the cases. Male got liver abscess easily compared to female. Abdominal pain and fever were most common symptom. Mean value for duration of stay is more in medical treatment (14.18 ± 2.926) as compared to percutaneous catheter drainage (10.38 ± 1.660), p = 0.001. Mean value for time taken for clinical improvement is more in Medical treatment (17.18 ± 2.926) as compared to percutaneous catheter drainage(13.38 ± 1.632), p = 0.001.One of the most important clinical finding in our study is tender hepatomegaly on right hypochondrium examination, 58.41% patient had hepatomegaly. Examination of drained pus showed that 75.24% patient had anchovy sauce pus.24.75% patient had purulent pus, trophozoites, cyst on drainage of liver abscess.Amoebic liver abscess showed motile trophozoites of Entamoeba histolytica on wet film examination in these patients. Involvement of right lobe is more common than left lobe of liver. In our prospective observational study found that patient underwent per cutaneous catheter drainage with medical management is a better treatment modality compared to medical management alone. The advantage of percutaneous catheter drainage is that it provides a continuous drainage of pus. Ultrasound sonography were repeated every 3 days initially in first week and then weekly for first month and then monthly until cavity had either disappeared, shown reduction in cavity size with clinical recovery. Criteria for successful treatment were clinical subsidence of infection and ultrasound sonography evidence of liver abscess resolution, such as disappearance or marked decreased in liver abscess cavity. Decision to remove the pigtail catheter was made when the total drainage from the catheter decreased to less than 10 ml/24 hour for two consecutive days.

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