European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 09, Issue 03, 2022

ORIGINAL RESEARCH

A Hospital Based Prospective Clinical-Radiological Study of Liver Abscess And It's Management In Patients Admitted To Surgical Ward At Newly Established Tertiary Care Center

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ABSTRACT

Background: Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. In recent years, imaging guided percutaneous drainage has been increasingly used to treat liver abscess of large size with viscous pus with reported success rates. Our study consists of clinical study (prospective study) of 40 cases of radiologically proven liver abscess and their management by different modalities and their outcome.

Materials& Methods: This is a hospital based prospective study done on 40 cases of radiological proven liver abscess in department of surgery at Government Medical College, Barmer, Rajasthan, India during one year period. USG abdomen was done, using longitudinal, oblique, transverse planes to visualize almost all part of liver. Intercostal and sub costal planes were used. All the liver lesions suggestive of liver abscess were examined in detail (any other abdominal organs were also scanned for any abnormalities). All the patients were hydrated and started on parenteral, third generation cephalosporins and Metronidazole therapy. All patients were simultaneously subjected to USG guided Needle aspiration.

Results: Our study showed that highest incidence (87.5%) of age is found between 3rd-6th decades. Male predominance is always reported in literatures. Liver abscess is commonly seen in low socio-economic group. Ultrasound guided percutaneous needle aspiration was the initial mode of treatment done in our study. Out of 40 patients, 16 patients were successfully treated with single aspiration, 13 required second aspiration, 8 patients were treated with percutaneous catheter drainage after failure of needle aspiration.

Conclusion: Percutaneous needle aspiration is found to be thefirst line of treatment for liver abscess. This method is simple, effective and cheaper. Sinceliver abscess occurs in low strata group in a country like India this procedure is affordable.Percutaneous catheter drainage should be reserved as 2nd line of treatment for large abscesses andabscesses with thick viscous content and for failure of percutaneous needle aspiration cases.

Keywords: Percutaneous Needle Aspiration, Percutaneous Catheter, USG, Liver Abscess.

INTRODUCTION

Liver abscess shares the clinical characteristics of a space occupying cartarylesion of infectious origin. Description of liver abscess data back to Hippocrates inapproximately 4000B.C. Ochsner and Debakey in 1938 provided a landmarkcollective review of pyogenic liver abscesses[1]. Liver abscesses, both amoebic and pyogenic, continue to be an important cause of morbidity and mortality in tropical countries. The advances in radiology like ultrasonography and CT scan since last 30 years including imaging and interventional techniques resulted in introduction of radiological guided aspiration anddrainage of intra-abdominal abscesses. The primary mode of treatment of amoebicabscess is medical; however many cases may be refractory to medical therapy.[2]

Also, secondary bacterial infection may complicate 20% of amoebic liver abscess. Insuch patients and in patients with pyogenic liver abscesses, aspiration has been thetraditional mode of treatment. Operative drainage is associated with significant (10 to47%) mortality and morbidity. In recent years, imaging guided percutaneous drainagehas been increasingly used to treat liver abscess of large size with viscous pus withreported success rates ranging from 70 to 100%, surgical intervention is typicallyunnecessary. Also, few studies have shown therapeutic needle aspiration to be asimpler and less costly mode of treatment.[3]

In country like India where there is malnutrition, improper sanitation, and excess alcohol intake so people are prone for amoebic liver abscess in those exposed to entamoeba histolytica. Even though liver abscess looks like a rare disease, but we are only seeing tip of Iceberg. This is mainly due to either delayed diagnosis or due to improper diagnosis and treatment. Our study consists of clinical study(prospective study) of 40 cases of radiologically proven liver abscess and theirmanagement by different modalities and their outcome.

MATERIALS& METHODS

This is a hospital based prospective study done on 40 cases of radiological proven liver abscess in department of surgery at Government Medical College, Barmer, Rajasthan, India during one year period.

Our hospital has large number of patients with symptoms of liver abscess, patients presented with following symptoms and signs selected for screening of liver abscess.

1. Pain abdomen (upper - RUQ)
2. Fever with Chills
3. Cough with right lower chest pain
4. History of chronic alcoholism
5. Tender hepatomegaly
6. Right basal pleural and pulmonary pathology.
7. Jaundice

Other symptoms like loss of weight, hiccoughs, right shoulder pain, diarrhea,nausea/vomiting and distention of abdomen with any of the above signs andsymptoms were subjected to ultrasound abdomen examination.

USG abdomen was done, using longitudinal, oblique, transverse planes to visualize almost all part of liver. Intercostal and sub costal planes were used. All the liver lesions suggestive of liver abscess were examined in detail (any other abdominal organs were also scanned for any abnormalities). Gross morphology of liver abscess was examined in detail with special attention to following.

1. Size of liver assessed for hepatomegaly.

2. Number of abscess and their locations were identified in relation to lobes/segmental anatomy of liver.
3. The contiguity of abscess to the liver capsule was noted.
4. Size and volume of abscess described.
5. Echogenecity of the abscess assessed. (hyperechoic, hypoechoic, anechoic).

Routine blood examination like haemoglobin %, RBS, blood urea, serum creatinine, total count, differential counts were done. Urine, stool, liver function tests and chest x-ray including upper abdomen radiographs were done. With good history, clinical head to toe examination, radiological and ultrasound abdomen investigation and provisional diagnosis of liver abscess was made.

All the patients were hydrated and started on parenteral, third generationcephalosporins and Metronidazole therapy. All patients were simultaneously subjectedto USG guided Needle aspiration.

METHODOLOGY

18G spinal needle and 20ml syringe was used for percutaneous needle aspirationunder LA under aseptic precaution. Pus aspirated till dryness.Sample collected sent for culture and sensitivity.Patient followed up in wards for adverse reaction like pain at the site.Sometimes mild fever was reported and treated with analgesics and antipyretics.Repeat check USG abdomen was taken to find residual abscess. In a few casesresidual pus was present, and the patients were subjected to repeat aspiration after 4-5 daysafter the initial aspiration. Patients were followed up in the wards. Most of the cases therewas complete resolution of pus after second aspiration.

In case of failure of needle aspiration due to large abscess >600ml and difficultaspiration such patients were subjected to continuous percutaneous drainage of liverabscess using malecot's catheter. This malecot's catheter was originally designed and usedfor percutaneous nephrostomy. The catheter of size 10 to 12 Fr was placed in 8^{th},9^{th} or 10^{th} intercostal space, or the site as guided by ultrasonography under localanesthesia using seldinger's technique. Patient in supine position, 2% lignocaine wasused for local infiltration; an 18-gauge needle used to aspirate the contents of thecavity and sent for examination. A small nick was made at entry site of needle; aguidewire was passed well inside the cavity slowly withdrawing the needle. Now thetract was dilated using dilators of required sizes. Catheter was placed in the cavityslowly withdrawing the guide wire; catheter was fixed to the skin and connected to acollecting bag.

CATHETER CARE

Daily irrigation of catheter once or twice with sterile normal saline was done, which preventsthe blockage of catheter, still if catheter is blocked stylette can be reintroduced to clean the catheter.

Daily estimation of volume, colour and consistency of the drainage fluid was recorded.Catheter is kept in site for an average period of 13 days. The duration may vary in individual cases depending on the quantity of pus, or presence of biliary fistula. Follow up was done usingultrasonography to note the shrinkage in size of the cavity every 4th or 5th day.

Removal of catheter was decided based on the amount of pus drained (<50 ml for threeconsecutive days). Relief of symptoms and sonological evidence of collapsing cavity or decrease inthe size of cavity.

Patients were followed up weekly for 1 month and monthly for next 3 months repeatingultrasonography.

RESULTS

Our study showed that highest incidence (87.5%) of age is found between 3rd- 6th decades. Male predominance is always reported in literatures. Liver abscess is commonly seen in low socio-economic group. In our study almost all patients were from low socio-economic group. 38 patients belong to low-income group. The low-income group being coolies, drivers, masons, farmers etc. it is at 87.5% and it is more common in persons who consumed alcohol for more than 40 years (table 1).

Table 1: Demographic profile of patients

Demographic profile	No. of Patients	Percentage
AGE GROUP (YRS)		
18-30 yrs	5	12.5%
31-40 yrs	15	37.5%
41-50 yrs	8	20%
51-60 yrs	8	20%
>60 yrs	4	10%
SEX		
Male	37	92.5%
Female	3	7.5%
Socioeconomic status		
Lower	38	95%
Middle	2	5%
Upper	0	0%
HIstory of alcohol intake		
Yes	35	87.5%
No	5	12.5%

In our study of 40 cases of liver abscess 39 cases gave history of right upper quadrant pain, which was dull aching, and a few patients gave history of pain referring to right shoulder. Fever with chills and rigors seen in 33 cases, weight loss was complained in 29 (72.5%) cases, anorexia in 19(47.5%) cases,13 cases gave history of diarrhoea and 10 patients had history of chest pain in association with dyspnea, cough in 12 cases, in most cases cough was dry in nature. Very few were known cases of COPD has cough with expectoration and 5 patients has history of dyspnoea (table 2).

Table 2: Distribution of patients according to clinical manifestation

Clinical manifestation	No. of patients	Percentage
Symptoms		
Pain abdomen	39	97.5%
Fever	33	82.5%
Weight loss	29	72.5%
Anorexia	19	47.5%
Cough	12	30%
Diarrhea	13	32.5%
SIGN		
Hepatomegaly	39	97.5%
Intercoastal tenderness	32	80%
Icterus	15	37.5%
Anemia	27	67.5%
Pedal edema	14	35%
Tachycardia	30	75%

On examination 27(67.5%) patients have variable degree of anemia (Hb<10 gm/dl), tachycardia in 75% of the cases. Tender hepatomegaly is a significant finding in 97.5% of cases along with 80% of cases with intercostal tenderness, colonic tenderness in few cases (table 2).

All patients were subjected to screening of chest with chest x-ray including upper abdomen. 40% of cases had elevated right dome of the diaphragm with restricted movements. The elevated right dome of diaphragm was due to upper enlargement of liver. 12.5% of cases had pleural effusion, basal lobe consolidation was seen in 15% cases. Cardiomegaly and involvement of pericardium was not seen in any of the cases. COPD and chronic bronchitis was seen in chest x-ray of most middle aged patients. Air fluid level seen below right diaphragm in 1 case probably due to gas forming organisms.

USG is a very important tool, both in diagnosis and therapeutic management of liver abscess. It is noninvasive, 80-90% accurate, capable of delineating liver lesions as small as 2 cms in diameter. Most of the abscesses are solitary cavity, however multiple abscess are not unusual. In the present study 27 (67.5%) cases had solitary abscess and 13 (32.5%) cases showed multiple abscesses (table 3).

Table 3: Distribution of patients according to Radiological

Radiological assess	No. of patients	Percentage
Chest x-ray (PA view)		
Raised dome of diaphragm	16	40%
Right basal pneumonitis	6	15%
Pleural effusion	5	12.5%
Air fluid level	1	2.5%
Site of abscess as per USG		
Right lobe	29	72.5%
Left lobe	5	12.5%
Both side	6	15%
Number of cavity		
Solitary	27	67.5%
Multiple	13	32.5%

Clinically and USG confirmed cases were initially treated with 3rd generation cephalosporins 1gm I.V and metronidazole 500mg I.V. They were simultaneously subjected to aspiration.

I.V. antibiotics were continued till the patient condition stabilisedi.e. till the patient becomes afebrile, receding trend in leucocytosis, towards normal and patient begins oral diet with GIT absorption. Later patients were discharged with continuation of oral antibiotics i.e. 3rd generation cephalosporins with Metronidazole for 2 weeks. Patient is also advised to abstain from alcohol, smoking and maintain personal hygiene.

DISCUSSION

Liver abscess (LA) is common in the tropical region like the Indian subcontinent. The common etiological agents for LA are *E. histolytica* (amoebic), bacterial (pyogenic), Mycobacterium tuberculosis, and various fungi. Out of them, ALA is largely a disease of developing countries like India. They tend to affect younger population especially males.

In our series also ALA accounted for about three-fourths of cases. Most of them were typically right lobe solitary abscess. This pattern of involvement has also been reported in previous series on ALA like by Sharma et al.[4] and Mukhopadhyay et al.[5] Majority of patients were young alcoholic male (with mean age of 41 years) of lower socioeconomic class which is also in accordance with the previous studies.[5] The age predisposition and gender differences may be as a result of high alcohol intake by young male which predisposes to ALA. Alcohol suppresses function of Kupffer cells (specialized macrophage) in liver which

has important role in clearing amoeba. Moreover, invasive amoebiasis appears to be dependent on the availability of free iron. 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.[6] Elderly individuals with underlying diseases and patients with compromised immunity due to malnutrition or corticosteroid therapy are also prone to invasion by amoeba. Moreover, Reddy and Thangavelu proposed that the female menstrual cycle prevents hepatic congestion and thus makes the organ less susceptible to abscess formation.[7]

Ultrasound guided percutaneous needle aspiration was the initial mode of treatment done in our study. Out of 40 patients, 16 patients were successfully treated with single aspiration, 13 required second aspiration, 8 patients were treated with percutaneous catheter drainage after failure of needle aspiration.

Most common symptoms of LA are pain abdomen and fever which were present in 97.5% and 82.5% of our patients, respectively. Various studies quote it in range of 62–94% and 67–87%, respectively.[4,5]Diarrhoea in LA could be due to associated intestinal amoebiasis and could be part of colonic condition predisposing to LA. It is not a common presentation; we reported it in 23% of patients. Previous studies report it variably from 4% to 33%.[4,5,8-10] Another uncommon complain in LA is cough. It is generally due to associated pleural effusion and compression collapse of the underlying lung parenchyma. Other causes are associated parenchymal lesions as in TLA and complications like rupture of abscess in pleural cavity. Cough as a symptom in our patients was present in 16% of patient. Previous series report it in 3.5–24% of cases.[4,11] Pleural effusion was present in 30% of our patients; all patients with cough belong to this group. Chest radiography helped a little with the diagnosis of LA, except for raised right hemidiaphragm giving some indirect clue of hepatomegaly. Most importantly, they showed associated pleural effusion which was predominantly right sided in most of our cases. The effusion was generally attributed to reactive pathology as they spontaneously disappeared after treating the abscess.

Relief of symptoms and sonological evidence of collapse of cavity were considered as the criteria for success of the study. In our study success rate of 96.5% was seen comparable with Rajak,etal.(1998)[12]and Ericvon Sonnenberg(1985)[13]with100% Success rate. K.P.Wong[14] with success rate of 85%, and Gerzof,et al.[15] with 83% Success rate. Average period of catheter drainage was 13 days. Average duration of hospital stay in PNA group was 10 days and in percutaneous catheter group was 15 days in our study.

CONCLUSION

Liver abscess is seen most commonly in low socioeconomic group with poor sanitation. Pain in right hypochondrium, fever, tender hepatomegaly, intercostal tenderness with history of alcoholism is diagnostic of liver abscess. Radiological investigation supports the diagnosis. Ultrasound abdomen is simple non-invasive tool, which confirms the site, size and number of liver abscess. It also guides in percutaneous needle aspiration as well as guides in the placement of catheter in difficult cases, very useful in monitoring and follow up of the patient.

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