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ORIGINAL RESEARCH

A study of etiology of liver abscess and evaluation of different modalities of its management

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Abstract
Background: Liver abscess is an encapsulated collection of suppurative material within the liver parenchyma, which may be infected by bacterial, fungal and parasitic micro-organisms. The present study was conducted to assess etiology of liver abscess and evaluation of different modalities of its management.
Materials & Methods: 50 patients with liver abscess (25 consecutive patients with any of liver abscess was study sample and 25 patients admitted in surgery ward with clinical laboratory and radiological features of liver abscess were divided into two treatment groups: GROUP 1 - Group I with abscess cavity <4 cm – they had received only medical management. GROUP 2 - Group II with abscess cavity >4 cm or smaller abscess which failed to respond to drug therapy alone, left lobe abscess, multiple liver abscess, ruptured liver abscess, they in addition were treated with USG guided – percutaneous needle aspiration or catheter drainage or by surgery.
Results: Most of cases belong to age group of 30-40 years and second most common group was 41-50 years and mean age of study subject was 38.4 years. Most of the patients had Amoebic liver abscess (84%). Most of the patients in our study belongs to low socioeconomic status (78%), both amoebic liver abscess and pyogenic liver abscess belongs to low socioeconomic status. There was significant difference in ALT (U/L), AST (U/L), alkaline phosphatase (IU/L), chest x-ray, involvement of lobe, single/multiple abscess, staining of aspirate in patients with amoebic liver abscess and pyogenic liver abscess ($P< 0.05$).
Conclusion: More than 84% patient were of amoebic liver abscess and among pyogenic liver abscess most common pathogen was E coli followed by klebsiella. There is increasing association of diabetes with both type of abscess and alcoholism remains important risk factor. Image guided drainage and open surgery was the best modality of treatment for multiple liver abscess and abscess size >4cm in both pyogenic and amoebic liver abscess however in small size abscess medical management is equally good.
Key words: Liver abscess, percutaneous needle aspiration, catheter drainage

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Introduction

Liver abscess can be defined as an encapsulated collection of suppurative material within the liver parenchyma, which may be infected by bacterial, fungal and parasitic micro-organisms.[1] Liver abscess, a disease troubling mankind from ancient times, has earliest documentation in the works of Bhrigu Samhita (3000 B.C.), wherein there is mention of blood and mucus in stools, with right upper abdominal pain. They have potentially lethal consequences, if prompt diagnosis and treatment are not accomplished. Liver abscess can be of various types depending on etiology. However, two major types are: amoebic and pyogenic in nature.[2]

The diagnosis and treatment and prognosis of liver abscess have evolved remarkably over past years. Although mortality has improved, it is still high, making early diagnosis of liver abscess exceedingly important to the clinical outcome.[3] Radiological imaging has improved diagnostic competence and has altered therapeutic strategy by allowing the possibility of percutaneous drainage.[4] 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 patient with hepatic abscesses. The concept of minimally invasive drainage has been and continues to be of paramount importance in treatment of hepatic abscesses.[5] Occasionally, Open drainage is indicated in recurrent abscess, failure of percutaneous drainage, large abscess of size more than 5cm and in multiple liver abscess, so in selective patients it may be a life- saving essential therapy.[6] The present study was conducted to assess etiology of liver abscess and evaluation of different modalities of its management.

Materials & Methods

The present study consisted of 50 patients with liver abscess (25 consecutive patients with any of liver abscess was study sample and 25 patients admitted in surgery ward with clinical laboratory and radiological features of liver abscess were taken as sample design. The patient were divided into two treatment groups:

GROUP 1- Group I with abscess cavity <4 cm – they had received only medical management.

GROUP 2- Group II with abscess cavity >4 cm or smaller abscess which failed to respond to drug therapy alone, left lobe abscess, multiple liver abscess, ruptured liver abscess, they in addition were treated with USG guided – percutaneous needle aspiration or catheter drainage or by surgery. Amoebic liver abscess - all patients with diagnosis of amoebic liver abscess of size < 4cm were treated with metronidazole 2-2.4 gms/day in divided dose.

Pyogenic liver abscess- all patient with PLA of size <4cm were treated initially with broad spectrum antibiotics till the culture and sensitivity report were available then treatment was guided as per sensitivity report. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Age wise distribution

Age (Years)	No. of cases	Percentage
<20	1	2.0%
20-30	9	18.0%
31-40	20	40.0%
41-50	15	30.0%
51-60	3	6.0%
61-70	2	4.0%
71-80	0	0.0%
Total	50	100.0%

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Most of cases belong to age group of 30-40 years and second most common group was 41-50 years and mean age of study subject was 38.4 years.

Table II Nature of abscess

Type of Abscess	Frequency	Percentage
Amoebic Liver Abscess	42	84
Pyogenic Liver Abscess	08	16

In our study most of the patients had Amoebic liver abscess (84%).

Table III Socioeconomic status

Socioeconomic Status	Amoebic LiverAbscess		Pyogenic LiverAbscess		Total	
	No. ofcases	%age	No. ofcases	%age	No. ofcases	%age
Low	32	64.0%	7	14.0%	39	78.0%
Medium	10	20.0%	1	2.0%	11	22.0%
Total	42	84.0%	8	16.0%	50	100.0%

Most of the patients in our study belongs to low socioeconomic status (78%), both amoebic liver abscess and pyogenic liver abscess belongs to low socioeconomic status.

Table IV Laboratory parameters

Parameters	Variables	Amoebic liver abscess	Pyogenic liver abscess	P value
ALT (U/L)	Normal (7- 56)	10	4	0.05
	Raised (> 56)	32	4	
AST (U/L)	Normal(5 – 40)	14	2	0.02
	Raised (>40)	28	6	
Alkaline Phosphatase (IU/L)	Normal(40-140)	12	4	0.01
	Raised(>140)	30	4	
Chest x-ray	Right Side of Diaphragm Elevated	16	4	0.04
	Not Elevated	26	4	
Involvement oflobe	Right Lobe of Liver	35	3	0.01
	Left Lobe	3	2	
	Both Lobe	4	3	
Single/Multiple Abscess	Single	38	6	0.02
	Multiple	4	2	
Staining of Aspirate	Gram Positive	0	1	0.04
	Gram Negative	0	7	

Table IV shows that there was significant difference in ALT (U/L), AST (U/L), alkaline phosphatase (IU/L), chest x-ray, involvement of lobe, single/multiple abscess, staining of aspirate in patients with amoebic liver abscess and pyogenic liver abscess ($P < 0.05$).

Discussion

Intra-abdominal infectious processes can involve the liver and lead to abscess formation.[7] This can be from gastric or colonic perforation or from perinephric or subphrenic abscesses.[8] Identifying these contiguous infections becomes important in planning treatment of the liver and primary abscess, both in terms of type of drainage therapy and antibiotic choices. Furthermore, liver abscesses can follow penetrating trauma.[9] The patient's clinical history

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guides the clinician in this diagnosis. This is a rare occurrence that can occur with direct seeding of the liver parenchyma with bacteria accompanying a penetrating injury or when a perihepatic hematoma becomes infected.[10]

We found that Most of cases belong to age group of 30-40 years and second most common group was 41-50 years and mean age of study subject was 38.4 years. Cosme A[11] et al in their study, 45 patients with PLA and 13 with ALA, more than a half were cholangitic (13 cases)or were of unknown origin (15 cases). In 10 patients, diabetes was considered to bea predisposing condition. Increased ESR (> 30), leukocytosis (> 12,000), fever and abdominal pain were observed in 95.5%, 86.7%, 82.8% and 68.9%, respectively. Twenty-five patients had single abscesses. Abscess and blood cultures were positive in 77.1% and 50% of cases, respectively (44.4% with polymicrobial infection). E. coli and S. milleri were the most commonly found germs. A percutaneous drainage was performed on 22 patients.

We observed that most of the patients had Amoebic liver abscess (84%). Gupta SS et al[12], eighty-two patients with amoebic liver abscess were randomly allocated to PCD (n= 42) or PNA (n= 40). Intervention was done under ultrasonography (US) [mainly] or computed tomography guidance within 24h of admission. PNA was repeated every 3rd day if the cavity size had not reduced to 50% of the original size, for up to three times. Persistence of cavity or of clinical symptoms was considered failure of treatment. Duration to attain clinical relief, duration of hospital stay, complications, treatment failure and deaths were recorded. PNA was successful in 32 (80%) patients (one aspiration in 4, two in 18 and three in 10 patients), while PCD was successful in 38 (90.5%) patients. Durations to attain clinical relief and parentral antibiotics required were significantly lesser in the PCD group. Hospital stay, although did not differ significantly, was lesser for PCD group. The only procedure-related complication due to PCD was rupture of abscess in two cases, leading to sepsis and death of one patient. Complications of PNA included pleural injury in one patient, and haemorrhage leading to subcapsular hematoma in another.

We found that most of the patients in our study belongs to low socioeconomic status (78%), both amoebic liver abscess and pyogenic liver abscess belongs to low socioeconomic status. There was significant difference in ALT (U/L), AST (U/L), alkaline phosphatase (IU/L), chest x-ray, involvement of lobe, single/multiple abscess, staining of aspirate in patients with amoebic liver abscess and pyogenic liver abscess. Ghosh et al[13] found that majority of them were from lower socioeconomic class (67.5%) and alcoholic (72%). The abscesses were predominantly in right lobe (71%) and solitary (65%). Etiology of abscess was 69% amoebic, 18% pyogenic, 7.5% tubercular, 4% mixed, and 1.5% fungal. Percutaneous needle aspiration was done in 79%, pigtail drainage in 17%, and surgical intervention for rupture in 4% patients. Mortality was 2.5%, all reported in surgical group. Solitary abscesses were amoebic and tubercular whereas multiple abscesses were pyogenic. Right lobe was predominantly involved in amoebic and pyogenic abscesses while in tubercular abscesses left lobe involvement was predominant.

Conclusion

Authors found that more than 84% patient were of amoebic liver abscess and among pyogenic liver abscess most common pathogen was E coli followed by klebsiella. There is increasing association of diabetes with both type of abscess and alcoholism remains important risk factor. Image guided drainage and open surgery was the best modality of treatment for multiple liver abscess and abscess size >4cm in both pyogenic and amoebic liver abscess however in small size abscess medical management is equally good.

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