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Research Article

Clinico-pathological profile of liver abscess: a prospective study of 100 cases

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ABSTRACT

Background: Liver abscess is a constant source of mortality and morbidity in general and tropical countries. India has second highest incidence of Liver abscess. This study were planned to identify the clinical profile of liver abscess in terms of demographic profile, clinical presentation, etiology, evaluation of different modalities of investigations, effectiveness of various treatment modalities and to study influence of alcohol and diabetes.
Methods: This study was carried out in a tertiary care centre in Northern India between the period of January 2013 to June 2014. An attempt was made in this study to define the various symptoms complex, treatment options and complications occurring in cases of liver abscess.
Results: In our study highest incidence occurred in 31-60 years age group (71%). Males were more commonly affected (92%). Abdominal pain (98%) was the most common symptom. Alcohol was the single most common etiological factor in 84% of cases of Liver abscess. Laboratory investigations were leucocytosis (72%), anaemia (23%), Raised B. Urea (21%), RBS >200mgm% (29%), raised alkaline phosphatase (83%), hypoalbuminemia (84%), PT >20sec (29%), raised SGOT (52%), SGPT (45%). Aspirated pus culture from liver abscess was sterile in 59.45% cases suggestive of amoebic etiology. Ultrasonography revaled solitary abscess in 78%. Isolated Right Lobe abscess was seen in 74%.72% of patients were subjected to percutaneous aspiration in abscess >100 ml or >3 cm; Recurrences were noted in 8% of cases in conservative management group.
Conclusions: Amoebic abscess is much more common than pyogenic liver abscess. Lack of proper sanitary condition, DM and addiction to alcohol are the most important predisposing condition for liver abscess. Ultrasound is simple, inexpensive and quick to perform, with a diagnostic accuracy of 90%.

Keywords: Liver abscess, Percutaneous aspiration, Conservative treatment

INTRODUCTION

Liver abscess is a very commonly encountered problem in surgical practice. Liver abscess has been since time of Hippocrates (400 B.C.), with the first published review by Bright appearing in 1936.[1] Liver abscesses is the commonest infection affecting Liver. Liver abscess is a constant source of mortality and mortality in developing countries. India being a developing country, a large proportion of population living under poverty line, a good amount of people are predisposed to liver abscess. Liver abscess if not treated properly leads to high chance of mortality. In 1938, Ochsner's classic review heralded surgical drainage as the definitive therapy.[2] However, even with the more aggressive treatment; the mortality rate remained at 60-80%. The development of new radiological techniques, early identification of causative microbiologic organism, and the more developed of drainage techniques, as well as better supportive care, have declined mortality rates to 5-30%; yet, still all these factor cannot change the prevalence of liver abscess. Untreated, this infection remains uniformly fatal.

Percutaneous aspiration and conservative treatment are two important modalities for treating Liver abscess. Though much progress has been made in direction of diagnosis and treatment but it still remains a major diagnostic and therapeutic problem, leading morbidity and mortality. The 3 major forms of liver abscess, classified by etiology, are as follows: A. Pyogenic abscess, which is most often poly microbial, B. Amoebic abscess due to *Entamoeba histolytica*, C. Fungal abscess, most often due to *Candida* species, less common. Pyogenic abscess accounts for majority in developed countries whereas amoebic liver abscess is largely a disease of developing countries like India.[3]

Pyogenic and amoebic liver abscess share many clinical features. Clinically the first diagnostic requirement is the demonstration of an abscess followed by its nature i.e. whether it is pyogenic and amoebic. Initially the diagnosis was dependent on variable clinical criteria and characteristic of pus aspirated. With advent of imaging techniques such as USG, CT scan, serology test the diagnosis of liver abscess can be made easily, rapidly and accurately.

METHODS

Sample size –Prospective study of 100 Cases admitted to indoor of Dept. of General Surgery, Hospital, over period of one and half year.

Inclusion criteria

Patients with clinical features of liver abscess and liver abscess confirmed on Ultrasound. Age of patients >18 years.

Exclusion criteria

Patient age ≤18 years. Old cases of liver abscess. Traumatic liver abscess.

Patients admitted to surgery ward were examined in details and thorough clinical history was taken (with special emphasis on alcohol abuse, diabetes, HIV). USG was done on the same day and all the routine and relevant investigations (CBC, Sugar, urea, creatinine, LFT, PT, HIV, X-ray Chest PA view) were done. Management Strategies followed were; (A) If abscess size was greater than >3cm or >100ml percutaneous aspiration (USG Guided) under antibiotic coverage; (B) If abscess size was <3cm /<100ml patients were put on conservative therapy (antibiotics only); (C) Laparotomy reserved for complications like Rupture of Liver abscess, peritonitis.

RESULTS

Most of the patients with liver abscess were in middle age with patients in third to sixth decade accounting for 71% of the cases. Mean age of presentation was 46.95. In our study there was high incidence of liver abscess in Males (72%).

Table 1: Age and sex distribution.

Age (years)	No. of patient	Percentage %	Sex	No. of patients	Percentage %
19-20	6	6			
21-30	14	14	Male	92	92
31-40	25	25			
41-50	21	21			
51-60	25	25	Female	8	8
>60	9	9			
Total	100	100	Total	100	100

Table 2: Clinical signs and symptoms.

Symptoms	No. of patients	Percentage %	Signs	No. of patients	Percentage %
Abd. pain	98	98	Tenderness	100	100
Fever	94	94	Temp >38.5°c	94	94
Cough	35	35	Resp. finding	61	61
Jaundice	25	25	Hepatomegaly	50	50
Diarrhoea	18	18	Icterus	24	24
			Pallor	23	23
			Shock	0	0

Pain abdomen (98%) and fever (94%) were the most common symptoms. Abdominal tenderness (RHQ) was the commonest sign found in 98% of cases. Hepatomegaly (50%), Jaundice (23%), Right intercostal tenderness (61%) were other clinical signs. Alcohol was the single most consistent etiological factor in 84% patients of liver abscess. Laboratory investigations were analysed. Leucocytosis (>11000) was found in 72.0% of cases. Anaemia (Hb<10gm %) was found in 23.0% of cases. RBS>200mgm% was found in 29 cases. Raised B. urea levels were seen in 21% of cases. Raised Alkaline phosphatase (83%) was the single most consistent liver function test to be abnormal in cases of liver abscesses. Hypoalbuminemia was noted in 84% of cases, Prolonged

prothrombin time (>20 sec) in 29% cases and raised SGOT (52%) & SGPT (45%). Raised WBC count (>20,000 cells/cu.mm), alkaline phosphatase level (>300 IU/l), diabetes, hypo albuminaemia (<2.0g/dl), Prolonged prothrombin time (>20 sec) were considered as the predictive factors of complicated (ruptured) liver abscess in our study. Out of these 74 cases, 44/74 (44%) cases had 'Anchovy sauce' appearance (suggestive of amoebic aetiology) of the pus which revealed no growth. While growths were obtained in 30/74 (40.54%) of these cases. *Enterococcus* was isolated in 7/74 (34.2%) of cases, *E. coli* was isolated in 9/74 (17.56%) of the cases, and *K. pneumoniae* in 13/74 (34.2%) cases *S. aureus* was isolated in only 1/74 (1.35%) case.

Table 3: LFT & other laboratory investigations.

LFT	No .of patients (n=100) %	95 % ci	Lab. investing's	No. of patients (n=100)%	95 % CI
S. ALB (3G %)	84(84%)	75.58-89.90	WBC>11000	72(72%)	62.51-79.86
ALP>150IU/L	83(83%)	74.45-89.11	RBS>200mgm%	29(29%)	21.01-38.54
SGOT>40IU	52(52%)	42.32-61.54	Hb<10gm%	23(23%)	15.84-32.15
SGPT>40IU	45(45%)	35.61-54.76	B. Urea>45mgm%	21(21%)	14.17-29.98
PT>20sec	29(29%)	21.o1-38.54	S. Creat>1.4mgm%	16(16%)	10.10-24.42
S. BIL>2.4mg %	23(23%)	15.84-32.15			

Table 4: Pus culture analysis.

Pus culture	No. of patients (n=74) %	95 % CI
Enterococcus	7(9.45%)	4.66-18.26
Klebsiella pneumoniae	13(34.2%)	10.58-27.77
E. coli	9(17.56%)	6.53-21.77
S. aureus	1(1.35%)	0.2-7.27
Sterile (anchovy sauce)	44(59.45%)	48.1-69.91

Table 5: USG findings.

USG findings	No. of patients (n=100) %	95% CI
Solitary abscess	78(78%)	68.53-85.60
A. RT lobe abscess	74(74%)	64.53-81.60
B. LT lobe abscess	4(4%)	1.57-9.84
Multiple abscess	22(22%)	15.0-31.07
A. Both lobe	04(4%)	1.57-9.84
B. Right lobe (multiple liver abscess)	18(18%)	11.70-26.67
Volume:		
A.<100ml	26(26%)	18.40-35.37
B. >100ml	74(74%)	64.63-81.60

Table 6: Treatment modalities.

Treatment	Number patients (n=100)	Percentage %
Antibiotic coverage only (conservative)	26	26
Asp (aspiration under antibiotic coverage)	72	72
Laparotomy	2	2

Acute onset of symptoms (<7 days) was the commonest mode of presentation (64%).

DISCUSSION

Most of the patients with liver abscess were in middle age with patients in third to sixth decade accounting for 71% of the cases. Mean age of presentation was 46.95, which is comparable to other study like Antonio Grorgia.[4] In our study there was high incidence of liver abscess in Males (72%), as seen in other study like Indian journal of surgery 96%.[5] Acute onset of symptoms (<7 days) was the commonest mode of presentation (64%).

Pain abdomen (98%) and fever (94%) were the most common symptoms.

Abdominal tenderness (RHQ) was the commonest sign found in 98% of cases. Hepatomegaly (50%), Jaundice (23%), Right intercostal tenderness (61%) were other clinical signs. Seeto & Rockey found that 60% of patients had either right upper quadrant tenderness and/or hepatomegaly.[6] Most of these clinical features were comparable to other studies except jaundice (23%) which was more common clinical presentation compared to Hyo Min Yoo, et al (7%).

In our study Alcohol was the single most consistent etiological factor in 84% patients of liver abscess, compared to Mathur S, et al.[7] 91.30% of male cases consumed alcohol. All these patients had history of alcohol consumption more than 1 year. Thus this study points strongly association of Alcohol and Liver abscess.

Laboratory investigations were analysed. Leucocytosis

(>11000) was found in 72.0% of cases. Anaemia (Hb<10gm%) was found in 23.0% of cases. RBS>200mgm% was found in 29 cases. Raised B.urea levels were seen in 21% of cases. Raised Alkaline phosphatase (83%) was the single most consistent liver function test to be abnormal in cases of liver abscesses. Hypoalbuminemia was noted in 84% of cases, Prolonged Prothrombin time (>20 sec) in 29% cases and raised SGOT (52%) & SGPT (45%). Raised WBC count (>20,000 cells/cu.mm), Alkaline phosphatase level (>300 IU/l), Diabetes, Hypo albuminaemia (<2.0g/dl), Prolonged Prothrombin time (>20 sec) were considered as the predictive factors of complicated (Ruptured) liver abscess in our study. In one series by JC Moore et al, *Streptococcus milleri* Lancefield group F was the commonest organism isolated in 13/16 (81.25%) cases. Ascending infection via billiary system is considered to be leading cause of hepatic abscess.[8] Portal infection is thought to account for generation of hepatic abscess. In one series by Sabbaj et al, 45% of pus cultures obtained from hepatic abscess were found to be anaerobic.[9] In other study by Wang J et al [10] 160 out of 182 (87.91%) pus cultures obtained from pyogenic liver abscess were caused by single microorganism *Klebsiella pneumoniae* and 22 (13.75%) were polymicrobial. Bacterial seedling may occur in context of deficiencies of host defences.[11]

Abscess cultures are more likely to be positive than blood cultures in pyogenic liver abscess.

Out of these 74 cases, 44/74 (44%) cases had 'Anchovy sauce' appearance (suggestive of Amoebic aetiology) of the pus which revealed no growth. While growths were obtained in 30/74 (40.54%) of these cases. Enterococcus was isolated in 7/74 (34.2%) of cases, *E. coli* was isolated in 9/74 (17.56%) of the cases, and *K. pneumoniae* in 13/74 (34.2%) cases. *S. aureus* was isolated in only 1/74 (1.35%) case. In western series, *E. coli* is the most frequent organism isolated. In oriental series, *Klebsiella* pneumonia may be the predominant organism. *Klebsiella pneumonia* was the most commonly cultured organism in our study. Rubin et al[12] analyzed culture techniques in 50 patients with pyogenic liver abscess, 55% of samples were found to be anaerobic. Hepatic abscess may be caused by mycobacterium but extremely rare. However, patients with acquired immunodeficiency syndrome presenting with hepatic abscess, mycobacterium tuberculosis is a common infecting organism.

Chest X-ray a finding were abnormal in 39% of cases and was comparable to other study by Rustam Khan.[13] Ultrasonography is simple, inexpensive and quick to perform, with a diagnostic accuracy of 90%[14] Ultrasound helps in determining the number, size and location of the abscess and can be used for percutaneous aspiration. Ultrasonography revealed solitary abscess in 78.0% and multiple abscesses were seen in 22.0% of cases.

Isolated right lobe abscess was seen in 74.0% and left lobe abscess seen in 04% of cases. Right lobe involvement was seen in 18/22of cases among multiple liver abscesses. Multiple abscess involving both lobes was seen in 4/22 patients. Number of cases with abscess volume <100 cc or size <3cms was 26% and those >100 cc or size >3cms was 74%. Cases who had multiple small abscesses or solitary abscesses <100 cc/ <3cm were managed conservatively in 26/100 (26.0%) patients. Bertel et al[12] published series of 39 patients with pyogenic hepatic abscess: 23 patients were treated surgically, 16 patients underwent percutaneous drainage. Three of the percutaneously treated group required surgical drainage due to viscous abscess content. Mortality was 17% in surgical group and 13% in percutaneously drained group. Wong[15] described 21 patients with pyogenic liver abscess treated by percutaneous drainage; this was successful in 85% of patients with mortality less than 10%. Many authors confirmed the safety the safety and efficacy of percutaneous aspiration or drainage and this is now considered the treatment of choice for patients presenting with hepatic abscess. Percutaneous needle aspiration appears to be less effective than PCD (Percutaneous drainage), though both procedure were shown to be safe and with no major complication and no deaths.[16] Laparoscopic drainage is an alternative for patients requiring open surgical drainage.[17]

72/100 (72%) of the cases with liver abscess >100ml/ >3cm size were subjected to percutaneous aspiration.

Complication like intraperitoneal rupture & peritonitis was seen in 2 patients (2%) who required laparotomy.

Patients were followed up once monthly for 3 months and thereafter once in six Months, Repeat USG scan were done as indicated.

Recurrences were noted in 8/100 (08%) of cases .All were from Conservative Management group. Cryptogenic was the most common aetiology in amoebic liver abscess (97.1%) and pyogenic liver abscess (73.3%). Group peritoneal rupture (2%) was the most common complication associated with liver abscess.

HIV serology was done in all patients of liver abscess in this study to investigate the relationship between immuno compromised state and liver abscess. However no HIV + case were reported in our study. There was no mortality in our study.

CONCLUSION

Liver abscess is one of most common infection affecting Liver. Amoebic abscess is much more common than pyogenic liver abscess on global scale. Though much progress has been made in direction of diagnosis and treatment of liver abscess, but it still remains a diagnostic and therapeutic problem. Delay in diagnosis remains a

major determinant of severity of illness and outcome in liver abscess. Lack of proper sanitary condition, DM and addiction to alcohol are the most important predisposing condition for liver abscess. Raised WBC (>20,000cells/comm.), alkaline phosphatise >300 units, diabetes, hypoalbuminemia (<2 gm%), prolonged PT (>20 sec) were considered as predictive factors of complicated (ruptured) liver abscess. Ultrasound is simple, inexpensive and quick to perform, with a diagnostic accuracy of 90%. It helps in determining the number, size and size and can be used as guide for percutaneous aspiration. Percutaneous aspiration is a very effective modality of treatment in uncomplicated cases. Surgery (Laparotomy) should be reserved for complications like rupture of abscess & peritonitis. Improvement in life style, provision of clean uncontaminated water and abstinence from alcohol could be a major boost in direction of elimination of this notorious disease.

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