TAJ June 2008; Volume 21 Number 1

ISSN 1019-8555
The Journal of
Teachers Association
RMC, Rajshahi

Original Article

Clinico-Pathological Profile of Liver Abscess in a Teaching Hospital

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Abstract

The study was conducted to assess the clinico-pathological profile of 50 liver abscess cases. This study showed that liver abscess is more common in male than in female. In present study Amoebic Liver Abscess (ALA) is much more common than Pyogenic Liver Abscess (PLA) and almost all the cases belonged to low or medium socio-economic class from rural areas. This may be due to poor living conditions, over crowding and unhygienic practices which leads to fecal contamination of food and drinks which help in transmission of amoeba. Liver abscess has correlation with consumption of indigenous alcohol. Ultrasonogram is an easy, widely available non-invasive and dependable investigation to diagnose liver abscess. In the absence of sophisticated investigations (e.g. Serum antibody against amoeba) at hand, only aspiration and study of pus is a good guide to confirm and to differentiate ALA from PLA. Complications like recurrence, pleuro-peritoneal involvement or rupture of the abscess are not common.

TAJ 2008; 21(1): 44-49

Introduction

Liver abscess is common in our country. Liver abscesses are of two types: amoebic and pyogenic and both have almost similar clinical features [1].The liver is the organ most subjected to the development of abscesses. Liver abscesses made up 13% of the total number of abscesses or 48% of all visceral abscesses[2]. . Liver abscess may be solitary or multiple. They may arise from hematogenous spread of bacteria or from local spread from contiguous sites of infection within the peritoneal cavity[3]. Parasitic disorders are more prevalent subjected in developing countries, especially those in tropical and subtropical regions[4]. Pyogenic liver abscess is uncommon but important because they are potentially curable, inevitably fatal if untreated and readily over-looked[1].The frequency of pyogenic liver abscess in hospitalized patients is estimated to range from 0.29% to 1.47% with a male: female ratio of 5:2[5]. Abscess once showed a predilection for males in earlier decades, no sexual predilection currently exists[6]. Amoebic and pyogenic abscess share many clinical, laboratory and imaging feature, at the same time they differ sharply in some respect, particularly with regard to epidemiology and treatment. Differentiation is essential for effective treatment[7]. Most pyogenic liver abscesses are polymicrobial. The most frequently isolated organisms are *Escherichia coli*, *Klebsiella*,

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Proteus, Pseudomonas and *Streptococcus* species. The most commonly identified anaerobic species are *Fusobacterium necoophorum, Bacteroides fragilis* and other *Bacteriodes* species[8].

The World Health Organization (1995)[9] estimates that annually 50 million cases of amoebic colitis and liver abscess develop[10] and rank third worldwide among the parasitic cause of death[11], the major cause of mortality is amoebic liver abscess[12].In Bangladesh, for the patient with invasive amoebiasis, there was a bimodal age distribution with peak at 2-3 years and over 20 years. The sex distribution was equal in children but young adults were predominantly male. Surveillance of diarrhea patients in Bangladesh showed prevalence of intestinal amoebiasis 4% in rural area and 6% in urban clinic[13]**.** Amoebic liver abscess (ALA) is bacteriologically sterile but bacterial infection may be associated with 0% - 33% cases. It is generally accepted that this secondary infection is mostly due to the intervention[14]. Patients with pyogenic liver abscesses belong to the older generation[15]. The patient of pyogenic liver abscess has a shorter duration of symptom, is more ill and often has a history of coexisting or preexisting disease[16]. Among the PLA cases 27% were found to be diabetic[17]. Complication of liver abscess is not common. It can arise has a result of abscess rupture or extension of infection[18]

Aims and Objectives

1. To determine the demographic profile of the patients with liver abscess.
2. To find out common clinical presentations.
3. To identify the etiological factors of the disease under study.
4. To determine the complications of the disease.

Material and Methods

Study population

It was a cross-sectional type of descriptive study carried out among 50 patients suffering from liver abscess in the Department of Medicine of Rajshahi Medical College Hospital. All the patients were above 13 years of age. Presence of abscess was detected by USG and confirmed by aspiration of pus. Among the 50 patients 44 were male and 6 were female. This study was conducted from November 2004 to October 2005 over a period of one year. Informed written consent was taken from the patients or guardians of the study subjects.

Procedure

Detailed history and thorough clinical examination were performed for all the patients. Following investigations were done for all cases –

1. Blood for TC, DC, Hb%, ESR
2. Stool for R/E
3. X-ray chest P/A view
4. Aspiration of liver abscess and microscopic examination
5. Culture sensitivity of pus

Other investigations like Liver functions tests (S.bilirubin, ALT, S.Alkaline phosphatase, Prothrombin time, S.total protein, S.albumin), Serum HBsAg and other relevant investigations were done in selected cases. Though culture of pus did not reveal any amoeba, a negative culture of pus supported by naked eye and microscopic finding of pus was taken as a case of amoebic abscess in this study as serum antibody against amoeba (Serological test) could not be done in this institute. Pus culture positive cases were considered as pyogenic liver abscess.

Data recording and Analysis

All relevant information were collected by interviewing patients or their guardians and recorded in pre-designed data sheet. Investigations report and other information were also preserved for each patient

Results

Among the 50 cases, 44 were male and 6 were female patients. The male and female ratio was 7.33:1. Most common age group affected was 21 to 50 years. In case of ALA age group was (31-40) and in case of PLA (41-50) age groups are commonly affected. The mean age was 45.5 ±5.97 years (Table-1). 22 had history of intake of indigenous alcohol (tari) [Table-3]. According to USG report 35 patients were having single abscess

and the rest 15 had multiple abscesses. Among the 50 cases 47 were from rural area and 3 from urban area. All of them were lower or middle class socio-economic condition (Table-2). The largest size was 16 X 14.5 cm and the smallest one 5.3 X 5.1 cm. The average size was 7 X 9 cm. On aspiration as much as 700 ml pus was aspirated and the lowest amount found in one case was 20 ml. But on an average 130-150 ml pus was aspirated. In naked eye examination color of 38 cases were chocolate or brown and in the rest 12 cases it was whitish or grayish. On microscopic examination of pus trophozoites of amoeba were found in 9 cases (Table-7). On the C/S report of pus 12 cases were culture positive and organisms were found (Table-8). In X-ray chest P/A view only 6 cases (having large abscess) right dome of diaphragm was slightly elevated and also associated with mild pleural effusion in the right side. Liver function tests were within normal limits in most of the cases. Only 4 PLA and 10 ALA cases showed mild rise of alkaline phosphates. In routine hematological tests in 47 cases there were leucocytosis and in 45 cases there were mild to moderate anaemia (Table-5). Stool R/M/E in 3 cases revealed trophozoite of amoeba and in 2 cases cyst of amoeba. Ova of *Ascaris lumbricoides* were found in 5 cases and ova of *Ancylostoma duodenale* were found in 2 cases (Table-6).

Table 1. Age and sex distribution of the study patients

Age in year	Male	Female	Total
11-20	3	0	3 (6%)
21-30	7	1	8 (16%)
31-40	13	3	16 (32%)
41-50	10	1	11 (22%)
51-60	7	1	8 (16%)
60-70	4	0	4 (8%)
Total	44 (88%)	6 (12%)	50 (100%)

Table 2. Occupation distribution

Occupation	ALA	PLA
Labourer	18 (43.76%)	4 (33.33%)
Farmer	10 (26.31%)	3 (25%)
Businessman	2 (5.26%)	1 (8.33%)
Student	4 (10.52%)	2 (16.66%)
Housewife	4 (10.52%)	2 (16.66%)
Total	38	12

Table 3. Symptoms presented by the patients with liver abscess at the time of examination

Symptoms	Patients with liver abscess	
	ALA (n=38)	PLA (n=12)
Fever	34 (89.47%)	12 (100%)
Upper abdominal pain	30 (78.94%)	8 (66.66%)
Anorexia	30 (78.94%)	10 (83.33%)
Weight loss	28 (73.68%)	8 (66.66%)
Nausea	15 (39.47%)	6 (50%)
Vomiting	10 (26.31%)	4 (33.33%)
Diarrhoea	6 (15.78%)	0 (0%)
Chest pain / cough	6 (15.78%)	0 (0%)

Table 4. Presenting signs among the liver abscess patients at the time of examination

Signs	ALA n=38	PLA n=12
Enlarged tender liver	23 (60.52%)	12 (100%)
Temp. >100º F	34 (89.47%)	12 (100%)
Anaemia	25 (65.78%)	8 (66.66%)
Jaundice	0 (0%)	1 (8.33%)

Table 5. Haematological findings among the liver abscess patients

Haematological findings	ALA n=38	PLA n=12
Anaemia	25 (65.78%)	8 (66.66%)
Leukocyte count (thousands/cmm)		
<11	3 (7.89%)	0 (0%)
11.1-15.0	32 (84.21%)	6 (50%)
>15	3 (7.89%)	6 (50%)
Percentage of neutrophil		
<70%	4 (10.52%)	0 (0%)
71-80%	31 (81.57%)	5 (41.66%)
>80%	3 (7.89%)	7 (58.33%)

Table 6. Microscopic examination of stool samples for intestinal parasites among liver abscess cases

Name of parasite	ALA n=38	PLA n=12
Trophozoite		
E. histolytica	3 (7.89%)	0 (0%)
E. coli	0 (0%)	0 (0%)
Trichomonas	0 (0%)	0 (0%)
Cysts		
E. histolytica	2 (5.26%)	0 (0%)
E. coli	0 (0%)	0 (0%)
Ova		
Ascaris lumbricoides	4 (10.52%)	1 (6.66%)
Ancylostoma duodenale	2 (5.26%)	0 (0%

Table 8. Rate of isolation of bacteria from liver aspirate of patient with PLA

Organism isolated	PLA (n=12)
Esch. Coli	6 (50%)
Proteus	3 (25%)
Pseudomonas	2 (16.66%)
Klebsiella	1 (8.33%)

Presentation

Among 50 patients 46 patients presented to the hospital with fever and 38 patients presented with upper abdominal pain. The durations of fever ranges from 14 to 35 days. 4 patients were found toxic and 5 patients presented with chills and rigor. 40 patients complaint of anorexia and 36 patients had history of weight loss. 6 patients had right sided pleural effusion (Table-3).

Complication

4 (10.52%) ALA cases and 2 (16.66%) PLA patients developed right sided pleural effusion. It was diagnosed clinically, radiologically and ultrasonographically.

Table 7. Microscopic finding of ALA and PLA aspirates

Liver aspirates (n=50)	Pus cell			RBC			Necrotic debris			E. histolytica (Trophozoi)	Organism in gram stain
ALA n=38 (C/S negative)	**F**	**M**	**P**	**F**	M	**P**	**F**	**M**	**P**	9 (23.68%)	0
	31 (81.57%)	7 (18.42%)	0	33 (86.84%)	5 (13.15%)	0	0	7 (18.42%)	31 (81.57%)		
PLA n=12 (C/S positive)	0	1 (8.33%)	11 (91.66%)	6 (50%)	6 (50%)	0	12 (100%)	0	0	0	12 (100%)

F = few, M = moderate, P = plenty

Discussion

Of the 50 patients studied larger 16 (32%) cases were found in age group of 31-40 years. Males were predominant 44 (88%) than females, 6 (12%). Khan et al (1991)[19] showed the peak age of onset between 21-50 years, which was similar to us and was similar to the study of Hold Stock et al (1987)[20]. The mean age of liver abscess is 40.5 ±5.97 years in this study. 12 aspirates were positive for gram staining and aerobic culture. Findings were strongly correlated with Barnes et al (1987) [17] in USA who stated that the presence of bacteria on gram stain or culture of the aspirates might be the indicator of PLA. Among these 38 cases, trophozoites of *E. histolytica* were detected microscopically in 9 cases (23.68%). In Durban, Gathiram et al (1984)[14] reported 21% cases were positive for *E. histolytica* trophozoites in aspirates. Mahajan and Ganguly (1980)[21] in India stated that only 15.2% liver aspirates showed the presence of *E. histolytica.* 12 patients of amoebic liver abscess (31.57%) and 10 (83.33%) of pyogenic liver abscess had history of intake indigenous alcohol (tari). In 4 (8%) cases there was history of 6 months and 15 (30%) cases 6 months to 2 years and 3 (6%) cases more than 2 years duration. Islam Q T, Ekram ARM et al.[22] showed that indigenous alcohol has association with the development of liver abscess especially pyogenic variety. Only 12 cases the culture of pus yielded growth of organism, the predominant organism was E. coli 6 (50%). The others were Proteus 3 (25%), Pseudomonas 2 (16.66%) and Klebsiella 1 (8.33%). These studies are in agreement with Moore et al (1981)[23] in UK, Mc Donald (1984)[24] in Australia, Sherlock et al (1993)[25] in UK found E. coli as the commonest organism. In contrast Yeoh et al (1997)[26] in Singapore reported *Klebsiella pneumoniae* as the commonest organism in PLA. In this study no fungal species were detected. Mc Donald (1984)[24] in Australia reported occasional liver abscesses caused by *Candida albicans.*

47 (94%) were from rural area and most of them from remote area. Mostly lower classes (low income group) of people were affected by liver abscess. Poor personal hygiene, poor sanitary condition, contaminated drinking water and ignorance of lower class people suffer more from *E. histolytica* infection. Walsh (1988) and Jalan et al (1988)[27] stated that amoebic infection was common among the low socio-economic group in India, South Africa and Mexico. Fever was common in 34 (89.47%) in ALA and 12 (100%) PLA cases, followed by abdominal pain. Pain in the right hypochondriac region was found in 38 (76%) cases, weight loss found 36 (72%). Weight loss may be due to chronicity of disease and also due to anorexia, nausea, and vomiting Nausea was found in 21 (42%) and vomiting 14 (28%). Anorexia was remarkable and it was in 40 (80%) cases. Khan et al (1991) [19] described symptoms e.g. fever (75.55%), pain in abdomen and epigastrium (71.1%), weight loss (26.7%) in ALA patients. Our study correlates with this study except weight loss, which is higher in our study. 6

(15.78%) ALA and none of the PLA patients in present study gave history of right lower chest pain and/or cough. Most of the liver abscesses were in right lobe (74%). Only 6 patients had right sided pleural effusion found both in chest X-ray and USG. On abdominal examination tenderness on palpation was present in 76% (both in ALA and PLA) cases. 5 patients who had multiple large abscesses were culture positive pyogenic abscess. In 38 (76%) tenderness was present in right hypochondriac region. The liver was found enlarged on palpation in 35 (70%) cases (Table-4). These findings correlate with other studies, which state that clinically hepatomegaly is found in 72% cases and right hypochondriac pain in 96% cases[28].

In this study, the liver function test results were mostly within normal limit. Only 4 (33.33%) PLA and 10 (26.31%) ALA cases, there was mild rise of alkaline phosphatase level. In present study anaemia was present in ALA (65.78%) and in PLA (66.66%). In ALA mild to moderate leucocytosis was present (92.10%) whereas moderate to severe leucocytosis present (100%) in PLA at the time of diagnosis. Barnes et al (1987)[17] in USA reported anaemia in both ALA (70%) and PLA (70%) patient and similar number of cases had leucocytosis and with a marked shift to the left (>89%) neutrophils in PLA. Khan et al (1991)[19] showed 26.7% polymorphonuclear leucocytosis and Rab et al (1967) reported leucocytosis in 4 (100%) complicated ALA cases. In present study only few (15.78%) of ALA patients had diarrhoea at the time of hospitalization. The findings are in contrast with Barnes et al (1987)[17] reported that diarrhoea occurred equally frequently in both ALA (71%) and PLA (6%) and Reynolds (1992)[7] reported mild to moderate diarrhoea in about one third of patients with both type of abscesses in USA. In our country PK Roy et al (2000)[28] stated loose motion in 4% of cases. Stool samples of all 50 liver abscess patients were examined microscopically especially for *E. histolytica*. In ALA trophozoites of *E. histolytica* were found in 3 (7.89%) cases and cysts in 2 (5.26%) cases. Our microscopic findings are much lower than the other reported values probably most of these cases of liver abscess were treated with metronidazole before admission into hospital or before collection of stool samples. In our study no major complications were seen. Only 4 (10.52%) patients of ALA had right sided pleural effusion. In case of pyogenic abscess complication may be rupture into peritoneal cavity and pleura, secondary infection and septicaemia[29].

Conclusion

This study was conducted in 50 cases, which is too small to represent the burden of liver abscess in the community. This study showed that liver abscess is more common in male than in female which might not reflect the true scenario, because women in our society are conservative due to religious background and seldom seek medical advice except in dire circumstances. In present study ALA is much more common than PLA and almost all the cases belong to low or medium socio-economic class from rural areas. This may be due to poor living conditions, over crowding and unhygienic practices which leads to faecal contamination of food and drinks which help in transmission of amoeba. So, the findings in this study are not entirely conclusive. Despite all the limitations in this study the following conclusions can be drawn both ALA and PLA, have almost similar clinical features. Most of the cases belong to the low income group. Liver abscess has correlation with consumption of indigenous alcohol. Ultrasonogram is an easy, widely available non-invasive and dependable investigation to diagnose liver abscess. In the absence of sophisticated investigations (e.g. Serum antibody against amoeba) at hand, only aspiration of pus is a good guide to confirm and to differentiate ALA (by naked eye, microscopic examination and culture sensitivity of pus) from PLA. Amoebic liver abscess is more common than pyogenic liver abscess. Complications like recurrence, pleuro-peritoneal involvement or rupture of the abscess are not common.

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