



Surgery

A COMPARATIVE STUDY OF CLINICAL PRESENTATION BETWEEN PYOGENIC AND AMOEBIC LIVER ABSCESS

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ABSTRACT **BACKGROUND AND OBJECTIVES:** Liver abscess (LA) is defined as collection of purulent material in liver parenchyma. Pyogenic liver abscess (PLA) constitutes the bulk of hepatic abscesses in developed nations. Amoebiasis affects approximately 12% of the world's population at any given time, but is endemic in tropical and developing countries. The present study has been designed to evaluate age, gender distribution and difference of clinical presentation between pyogenic and amoebic liver abscess.

MATERIAL AND METHOD: The present study has been conducted on 55 patient diagnosed with liver abscess admitted in General Surgery department Silchar Medical College and Hospital during the period of July 2019 to June 2020. Detailed history taking, clinical examination, routine investigations, and various specialised investigations like USG abdomen and chest x-ray were done in all the cases. Final diagnosis of pyogenic liver abscess and amoebic liver abscess was confirmed by the result of aspirated pus sent for culture and sensitivity. An amoebic liver abscess was diagnosed by negative culture report with clinical and radiological correlations.

RESULTS: It has been found that patients diagnosed with amoebic liver abscess were found to be significantly younger than those with pyogenic abscess, with mean ages of 35.1 years and 49.7 years, respectively ($p=0.0002$). Male preponderance could be statistically proven in amoebic liver abscesses as supported by p value of 0.0016. History of diarrhea and alcohol intake was more common in patients with amoebic abscess. However diabetes mellitus and hypoalbuminemia is most commonly associated with pyogenic liver abscess.

CONCLUSION: Improved awareness can decrease complication and mortality rate.

KEYWORDS : Liver abscess, Pyogenic abscess, Amoebic abscess.

INTRODUCTION

Liver abscess (LA) is defined as collection of purulent material in liver parenchyma which can be due to bacterial, parasitic, fungal, or mixed infection. In both developed and developing country it is an important clinical problem with significant mortality rate (1). Out of total incidence of LA, approximately two-thirds of cases in developing countries are of amoebic etiology and three-fourths of cases in developed countries are pyogenic (2). Escherichia Coli, Klebsiella, and Streptococcus are the most etiology of PLA (3). Amoebiasis is presently the third most common cause of death from parasitic disease(4). Amoebic liver abscess (ALA) accounts for 3–9% of all cases of amoebiasis (5). However, pyogenic etiology should always be entertained in the differential diagnosis.

AIMS AND OBJECTIVES

- To study the age and gender distribution between pyogenic and liver abscess.
- To study the differences between clinical presentation of pyogenic and amoebic liver abscess.

MATERIALS AND METHODS

The present study has been carried out on the patients who were diagnosed with liver abscess and admitted in the General Surgery Department, Silchar Medical College and Hospital between July 2019 to June 2020. 53 patients admitted with liver abscess were taken in this study during the said period. All 53 patients in our study were subjected to detailed history taking, clinical examination, routine investigations, and various specialised investigations. USG abdomen and chest x-ray were done in all the cases. After confirmation of the diagnosis, specific investigations directed towards etiological factors such as Pus culture and sensitivity, Blood culture and sensitivity, Stool for ova and cyst, serological tests (ELISA) were done depending upon the availability of the mentioned tests at our hospital at the time of admission.

Final diagnosis of pyogenic liver abscess and amoebic liver abscess was confirmed by the result of aspirated pus sent for culture and sensitivity. An amoebic liver abscess was diagnosed by negative culture report with clinical and radiological correlations.

RESULTS AND OBSERVATION

Table 1: Demographic And Clinical Features Of Pyogenic And Amoebic Liver Abscesses:

PARAMETERS		PYOGENIC ABSCESS (n=22)	AMOEBIC ABSCESS (n=31)	P VALUE
AGE:	<40 years	4	22	0.0002
	>40 years	18	9	
SEX:	Male	11	28	0.0016
	Female	11	3	
PRESENTING FEATURES:				
Pain abdomen	present	21	31	0.4151
	absent	1	0	
Fever	present	22	27	0.1324
	absent	0	4	
Vomiting	present	9	10	0.5703
	absent	13	21	
Diarrhea	present	3	15	0.0098
	absent	19	16	
Cough	present	6	5	0.4933
	absent	16	26	
Rales/rhonchi	present	6	1	0.0124
	absent	16	30	
Jaundice	present	5	6	1.0000
	absent	17	25	
Upper abdominal tenderness on palpation	present	21	28	0.6332
	absent	1	3	
Palpable lump abdomen	present	11	23	0.0875
	absent	11	8	
History of DM	present	10	1	0.0003
	absent	12	30	

History of alcohol intake	present	3	13	0.0356
	absent	19	18	

Fig 1: Demographic features in pyogenic vs amoebic liver abscess

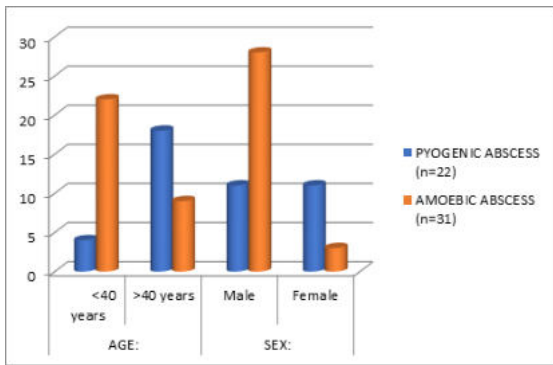


Fig2: Symptoms In Pyogenic(series1) Vs Amoebic(series2) Liver Abscesses

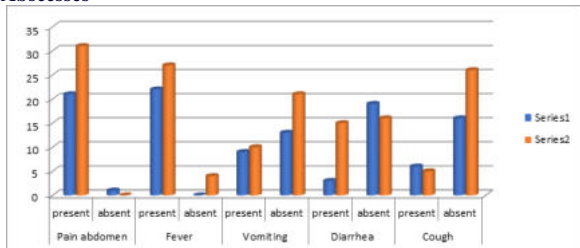


Fig3: Clinical Findings In Pyogenic(series1) Vs Amoebic(series2) Liver Abscesses

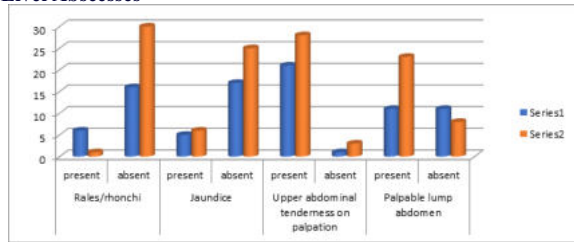
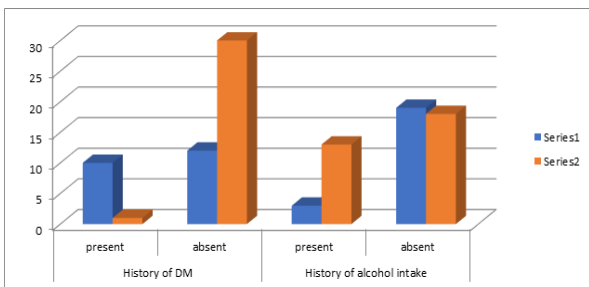


Fig4: Personal History In Pyogenic(series1) Vs Amoebic(series2) Liver Abscesses



Using univariate analysis, patients diagnosed with amoebic liver abscess were found to be significantly younger than those with pyogenic abscess, with mean ages of 35.1 years and 49.7 years, respectively (p=0.0002). Males and females were affected equally in cases of pyogenic abscesses in this study while male preponderance could be statistically proven in amoebic liver abscesses as supported by p value of 0.0016 (M:F ratio) for amoebic vs pyogenic group.

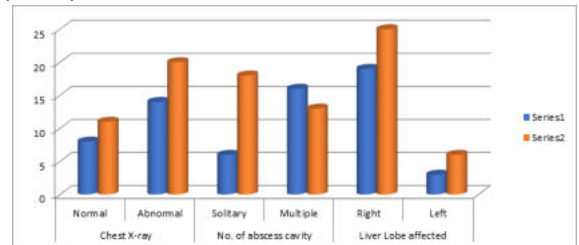
Pain abdomen and fever were not found significant while comparing the two groups; whereas, history of diarrhea was more common in patients with amoebic abscess (p=0.0098). Patients diagnosed with pyogenic abscess had a significant correlation with history of diabetes mellitus as compared to those diagnosed with amoebic abscess (p=0.0003); whereas, amoebic liver abscess patients were found to be more frequently alcoholic (p=0.0356). Patients with pyogenic abscess were much more likely to have an abnormal pulmonary finding on

auscultation in the form of rales/rhonchi (p=0.01).

Table2: Laboratory And Radiographic Features Of Pyogenic And Amoebic Liver Abscesses

PARAMETER		PYOGENIC ABSCESS (n=22)	AMOEBIC ABSCESS (n=31)	P VALUE
Total Leucocyte Count (TLC)	Mean value	16.5	17.2	
Serum Creatinine(mg/dl)	Mean value	1.1	1.2	
Serum Albumin (g/dl)	<3.0 g/dl	11	5	0.0142
	>= 3.0 g/dl	11	26	
Serum total bilirubin(mg/dl)	Upto 1.0 mg/dl	13	21	0.5703
	>1.0 mg/dl	9	10	
Serum Alkaline Phosphatase (IU/ml)	Upto 120 IU/ml	15	20	1.0000
	>120 IU/ml	7	11	
Chest X-ray	Normal	8	11	1.0000
	Abnormal	14	20	
No. of abscess cavity	Solitary	6	18	0.0489
	Multiple	16	13	
Liver Lobe affected	Right	19	25	0.7195
	Left	3	6	

Fig5: Radiological findings in pyogenic(series1) vs amoebic (series2) liver abscesses



The two groups showed similar results when mean total leucocyte count (TLC) and serum creatinine were calculated. There were also no significant differences in total serum bilirubin and serum alkaline phosphatase levels for both groups; however, serum albumin levels in the pyogenic group was significantly lower than that of the amoebic group (p=0.0142).

Chest X-ray abnormalities including pulmonary infiltrates, pleural effusion or elevated right hemidiaphragm were found with comparable frequency in both the groups; however, patients with pyogenic abscess had significantly greater percentage of multiple lesions compared to those with amoebic infection (p=0.0489). Right lobes were more often affected in both the groups.

DISCUSSION

Only a few literature reports have comparatively studied a sizeable number of patients with amoebic and pyogenic liver abscess (Ogden et al. 1961; Barbour & Juniper 1972 (6); Balasegaram 1981; Conter et al. 1986 (7); Barnes et al. 1987 (8); S.Lodhi et al. 2004 (9).

Table3: We have observed or confirmed a number of criteria that seem to be of value in non-invasively differentiating the microbial aetiologies of these abscesses

Characteristic (statistically significant differences with p value <0.05)	Our study (n=53)	S.Lodhi et al. (2004) (n=577)	Barnes et al. (1987) (n=144)	Conter et al. (1986) (n=82)	Barbour and Juniper (1972) (n=66)

Age (>40 years)	Pyogenic	Pyogenic	Pyogenic	Pyogenic	Pyogenic
Male predominance	Amoebic	Amoebic	Amoebic	NS	NS
Abdominal pain	NS	NS	Amoebic	Amoebic	Amoebic
Diarrhoea	Amoebic	NS	Amoebic	Amoebic	Amoebic
Cough	NS	NS	Pyogenic	NS	-
Jaundice	NS	Pyogenic	Pyogenic	Pyogenic	NS
Abdominal tenderness	NS	Amoebic	Amoebic	Amoebic	NS
Hepatomegaly/palpable lump	NS	NS	NS	Amoebic	NS
Rales/rhonchi	Pyogenic	Pyogenic	-	NS	NS
Diabetes Mellitus	Pyogenic	Pyogenic	Pyogenic	-	-
Hypoalbuminemia (<3 g/dl)	Pyogenic	Pyogenic	Pyogenic	NS	-
Elevated bilirubin	NS	NS	Pyogenic	Pyogenic	-
Elevated ALP	NS	NS	NS	Pyogenic	Amoebic
Solitary abscess	Amoebic	Amoebic	NS	NS	-
Right lobe abscess	NS	Amoebic	NS	NS	NS

Literature reports the presence of prior gastroenteritis more commonly in persons with amoebic abscess (Barbour & Juniper 1972; Conter et al. 1986; Barnes et al. 1987), as found in our study too with a p value of 0.0098 which is statistically very significant.

Our finding of an association between pyogenic liver abscess and diabetes mellitus (p value of 0.0003) confirmed that of previous investigators (Greenstein et al. 1984; Conter et al. 1986; S.Lodhi et al. 2004).

While our study confirmed that there was no difference between the peripheral white blood cell counts in patients with amoebic or pyogenic abscesses (Barbour & Juniper 1972; Ribaud & Ochsner 1973; Conter et al. 1986), hypoalbuminaemia was found to be more common in those with bacterial abscess (p value of 0.0142) which can be correlated with the study by S.Lodhi et al. in 2004 who had found a p value of 0.02 in their study.

Our results found serum liver enzymes to be of no value in distinguishing between amoebic and pyogenic abscess (S.Lodhi et al. 2004); although previous observers have suggested that bacterial abscesses may be more frequently associated with greater elevations of serum alanine transferase and alkaline phosphatase (Barbour & Juniper 1972; Barnes et al. 1987)

Abdominal pain was found to be non-significant in distinguishing ALA and PLA in our study (S.Lodhi et al.2004);however some of the previous studies had found pain abdomen to be more consistently associated with ALA (Barbour & Juniper 1972; Conter et al. 1986; Barnes et al. 1987

Jaundice was more common among patients with pyogenic abscess in previous studies (Ogden et al. 1962; Conter et al. 1986; Barnes et al. 1987); whereas it was not significantly common in any of the groups (Barbour and Juniper 1972).

Cough was not found to be a significant factor in our study as supported by previous studies (S.Lodhi et al. 2004, Conter et al. 1986); whereas, presence of rales/rhonchi on auscultation of the chest could be found more commonly in PLA (p value of 0.01), which is in accordance with the study by S.Lodhi et al. 2004 (p value of 0.009). However previous other studies did not report any statistically significant relationship between rales/rhonchi and PLA (Barbour & Juniper 1972; Conter et al. 1986).

Abdominal tenderness and hepatomegaly were not found to be statistically significant in our study in differentiating ALA from PLA. Some previous studies have found abdominal tenderness to be significantly associated with ALA (S.Lodhi et al. 2004; Barnes et al. 1987; Conter et al. 1986; whereas study by Juniper and Barbour in 1972 had found this correlation insignificant.

Hepatomegaly was found non-significant in most of the previous studies (S.Lodhi et al. 2004; Barnes et al. 1987; Barbour and Juniper

1972), except Conter et al. in 1986 who found hepatomegaly to be more commonly a finding in ALA.

Although a few previous studies have noted certain ultrasonographic criteria to be more characteristic of amoebic abscess (Ralls et al. 1987), we could find no such features diagnostically useful in suggesting the microbial aetiology of hepatic abscess. Solitary lesions have been repeatedly found to be more common in amoebic disease (Ogden et al. 1961; Barbour & Juniper 1972; Ribaud & Ochsner 1973; Balasegaram 1981; Conter et al.1986; S.Lodhi et al. 2004) and our study has verified this finding (p value of 0.0489). Ultrasonography can, however, be useful in identifying aetiologies commonly associated with pyogenic liver abscess such as cholangitis, bile duct occlusion and underlying liver cirrhosis.

The site of abscess (right/left lobe) was not found significant in our study (Barnes et al. 1987; Conter et al.1986; Barbour and Juniper 1972); however S.Lodhi et al. in their study in 2004 had found ALA to be more commonly occupying the right lobe of the liver.

The age predisposition and gender differences may be as a result of high alcohol intake by young males 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 (R.P. Makkar et al. 2003; S. Ghosh et al.2014).

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 (Reddy and Thangavelu 1948).

In our study,we found alcohol consumption to be more frequently associated with ALA (p value of 0.03); and is well documented in a previous studywith p value of 0.013 (S.Ghosh et al. 2014).

CONCLUSION

In present study amoebic liver abscess is more common in <40 yrs of age (p=0.002) though pyogenic is more common in > 40 yrs of age. Amoebic liver abscess is male predominance with association with diarrhea and alcohol intake. However diabetes mellitus and hypoalbuminemia is most commonly associated with pyogenic liver abscess. Improved awareness can decrease complication and mortality rate.

REFERENCES:

1. Abbas, M. T., Khan, F. Y., Muhsin, S. A., Al-Dehwe, B., Abukamar, M., & Elzouki, A. N. (2014). Epidemiology, clinical features and outcome of liver abscess: a single reference center experience in Qatar. *Oman medical journal*, 29(4), 260.
2. Ochsner, A., DeBakey, M., & Murray, S. (1938). Pyogenic abscess of the liver: II. An analysis of forty-seven cases with review of the literature. *The American Journal of Surgery*, 40(1), 292-319.
3. Jha, A. K., Das, A., Chowdhury, F., Biswas, M. R., Prasad, S. K., & Chattopadhyay, S. (2015). Clinicopathological study and management of liver abscess in a tertiary care center. *Journal of natural science, biology, and medicine*, 6(1), 71.
4. Greenstein, A. J., Lowenthal, D., Hammer, G. S., Schaffner, F., & Aufses Jr, A. H. (1984). Continuing changing patterns of disease in pyogenic liver abscess: a study of 38 patients. *American Journal of Gastroenterology (Springer Nature)*, 79(3).
5. Schofield, P. F. (1996). Essential Surgical Practice. *Annals of The Royal College of Surgeons of England*, 78(5), 482.
6. Barbour, G. L., & Juniper Jr, K. (1972). A clinical comparison of amoebic and pyogenic abscess of the liver in sixty-six patients. *The American Journal of medicine*, 53(3), 323-334.
7. Conter, R. L., Pitt, H. A., Tompkins, R. K., & Longmire Jr, W. P. (1986). Differentiation of pyogenic from amoebic hepatic abscesses. *Surgery, gynecology & obstetrics*, 162(2), 114-120.
8. Barnes, P. F., De Cock, K. M., Reynolds, T. N., & Ralls, P. W. (1987). A comparison of amoebic and pyogenic abscess of the liver. *Medicine*, 66(6), 472-483.
9. Lodhi, S., Sarwari, A. R., Muzammil, M., Salam, A., & Smego, R. A. (2004). Features distinguishing amoebic from pyogenic liver abscess: a review of 577 adult cases. *Tropical Medicine & International Health*, 9(6), 718-723.