

Correlation of Etiology, Clinical Features with Type of Liver Abscess and Complications of Liver Abscess

Dr. Bharath.G.R,

Senior resident, Department of General Surgery, Mysore Medical College And Research Institute, Mysore-570001

Corresponding Author: Dr. Avinash.T.R

Senior resident, Department of General Surgery, Mandya Medical College And Research Institute, Mandya-571404

Date of Submission: 28-10-2021

Date of Acceptance: 11-11-2021

I. Introduction

□ Liver abscess is a common condition in India. India has 2nd highest incidence of liver abscess in the world. Liver abscesses are caused by bacterial, parasitic or fungal infection.

□ Pyogenic abscesses account for three quarters of hepatic abscess in developed countries and are caused due to diseases of the biliary tract, haematogenous spread and direct extension. While amoebic liver abscess cause two third of liver abscess in developing countries². Cryptogenic abscess, with unknown etiology still account for 20% of pyogenic liver abscess,

□ Amoebiasis is presently the third most common cause of death from parasitic disease.

□ The World Health Organization reported that Entamoeba Histolytica causes approximately 50 million cases and 100,000 deaths annually. The vast majority of these infections are acquired in the developing world. In a country like India where majority of population lives below poverty line, basic sanitary facilities are lacking. This coupled with overcrowding and urban slums and also outdoor unhygienic eating habits sets the stage for communicable diseases like amoebiasis.

□ Liver abscess continues to be disease with considerable mortality in our country.

Locally made alcoholic drinks like neera, arrack may be the routes of faeco-oral transmission of amoebic cysts.

□ In the wake of HIV epidemic in our country, this study also tries to investigate the relation between liver abscess and immuno-compromised state of AIDS.

□ Primary prevention by improving sanitation, health education, early diagnosis and prompt treatment may result in lowering mortality / morbidity associated with the disease.

□ This study has tried to delineate clinical profile, etiology and complications of liver abscesses.

II. Material And Methods

Study Design: A Prospective Clinico-Pathological study with 100 patients diagnosed to have Liver Abscess and undergoing treatment in Mysore Medical College, Mysore between November 2017 to May 2019 inclusive of a follow up period of 3 months-2years is undertaken, to study the Clinical, Pathological and Management Strategies in Liver Abscess.

Statistical Methods:

Descriptive statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean \pm SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. 95% Confidence Interval has been computed to find the significant features. Confidence Interval with lower limit more than 50% is associated with statistical significance.

Inclusion criteria

- 1.All cases of liver abscess diagnosed clinically and/or ultrasonographically of Age group >15yrs of either sex.
- 2.All cases in evolving, liquified & ruptured stage with or without peritonitis.

Exclusion criteria

- Liver diseases like portal hypertension, cirrhosis of liver, hepatic malignancy.
- Patients with bleeding and clotting disorders.
- Patients who are not willing for specific investigations like USG, CT and aspiration of the abscess.
- Age <15yrs not included.
- Traumatic Liver Abscess.

Procedure

Patients for clinical study will be selected from the wards of K.R.Hospital with the following inclusion and exclusion criteria. A minimum of 30 cases of liver abscess will be studied.

All selected cases will be studied upto discharge regarding the type of liver abscess and treatment modalities and followed up in OPD for 1 year regarding post operative complications.

1.After obtaining clearance and approval from the institutional ethical committee, patients fulfilling the inclusion/ exclusion criteria will be included in the study, after obtaining informed consent.

2.Patients with any 3 of the below criteria will be labeled as having liver abscess and will be taken up for the study.

- Enlarged tender liver presenting as mass per abdomen.
- Fever.
- Radiological investigations suggestive of liver abscess.
- Demonstration of characteristic pus by percutaneous needle aspiration, or open drainage from the liver.
- Unequivocal response to metronidazole and or other antibiotics, with or without aspiration or open drainage of liver abscess.

3. Detailed history of all patients is taken with thorough clinical examination and entered into a proforma during their stay and follow up.

4. Investigations are done.

5. After establishing diagnosis, medical treatment is initiated from day of admission.

- Intravenous cefotaxime 1 gm BD
- Intravenous metronidazole 100 ml TID
- supportive therapy

6. Seeing response to therapy, patients are selected for aspiration, Malecot's/ pigtail catheterization and open surgical drainage in addition to specific drugs.

7. The response to therapy is assessed.

Statistical analysis

The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1,

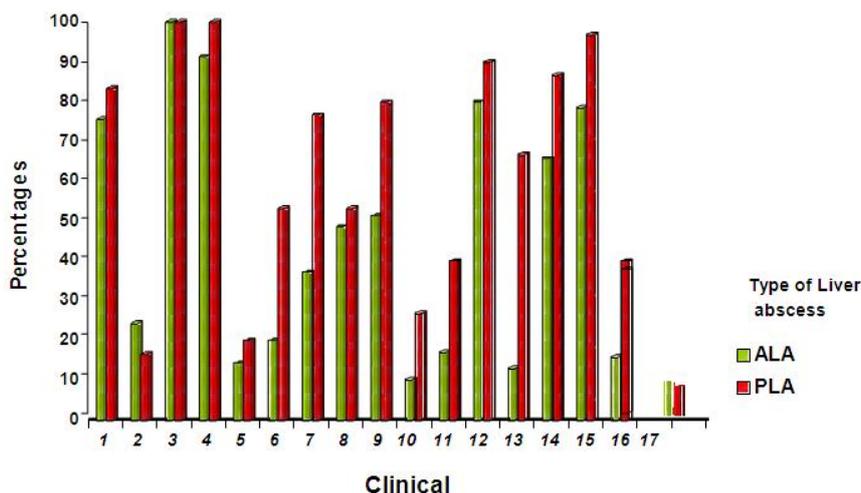
MedCalc 9.0.1 ,Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables

III. Results

 **TABLE 40: CORRELATION OF CLINICAL FEATURES WITH TYPE OF LIVER ABSCESS**

Clinical features	Type Liver abscess		P value
	ALA (n=70)	PLA (n=30)	
1.Solitary liver abscess	53 (75.7%)	24 (83.3%)	0.399
2.Multiple liver abscess	18 (24.3%)	5 (16.7%)	0.399
3.Pain	70 (100%)	30 (100%)	NS
4.Fever	64 (91.4%)	30 (100%)	0.174
5.Diarrhoea	10 (14.3%)	6 (20%)	0.475
6.Cough	14 (20%)	16 (53.3%)	0.001**
7.Tenderness + guarding	26 (37.1%)	23 (76.7%)	<0.001**
8.Hepatomegaly	34 (48.6%)	16 (53.3%)	0.663
9.Pleural effusion	36 (51.4%)	24 (80%)	0.008**
10.Ascites	7 (10.0%)	8 (26.7%)	0.032*
11.Jaundice	12 (17.1%)	12 (40%)	0.014*

12.Increased alkaline phosphatase	56 (80%)	27 (90%)	0.222
13.RBS >200 mg/dl	9 (12.9%)	20 (66.7%)	<0.001**
14.Wbc count >11,000	46 (65.7%)	26 (86.7%)	0.032*
15.Albumin <3g/dl	55 (78.6%)	29 (96.7%)	0.024*
16.Bilirubin (>2.4 gm/dl)	11 (15.7%)	12 (40%)	0.008**
17.Ruptured (Peritonitis)	7 (10%)	6 (20%)	0.012*



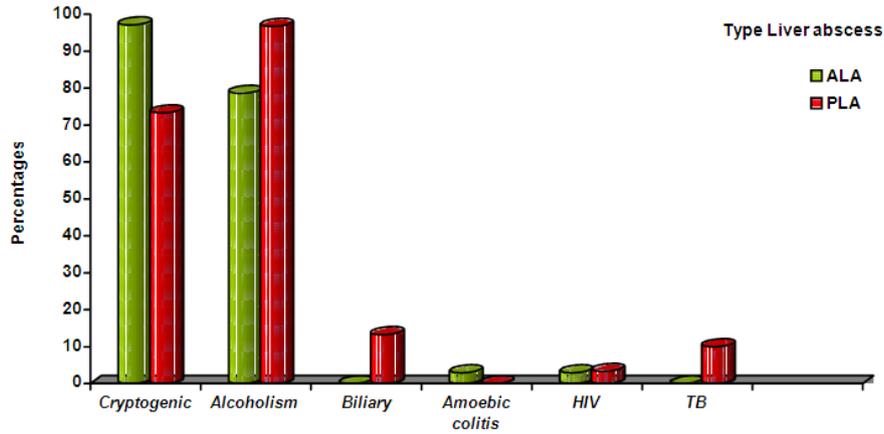
GRAPH 21: CORRELATION OF CLINICAL FEATURES WITH TYPE OF LIVER ABSCESS

✦ Diabetes (RBS>200mg/dl), Cough, Tenderness and Guarding, Pleural Effusion, Ascites, Jaundice (Bilirubin >2.4 gm/dl), Raised Total Leucocyte count (>11,000 cells/cu.mm), Hypoalbuminaemia (Albumin <3gm/dl), Ruptured Liver Abscess (Peritonitis) was statistically significant finding in Pyogenic Liver Abscess and suggests a strong co-relation as P value <0.005 which is significant

✦ Whereas Other findings such as Pain, Fever, Diarrhoea, Raised Alkaline Phosphatase were found almost equally in all cases of liver abscess.

TABLE 41: CORRELATION OF ETIOLOGY WITH TYPE LIVER ABSCESS

Etiology	Type Liver abscess		P value
	ALA (n=70)	PLA (n=30)	
Cryptogenic	68 (97.1%)	22(73.3%)	<0.001**
Biliary	0	4(13.3%)	0.007**
Amoebic colitis	2(2.9%)	0	1.000
HIV	2(2.9%)	1(3.3%)	1.000
Tuberculosis	0	3(10.0%)	0.025*
Alcoholism	55(78.6%)	29(96.7%)	0.034*



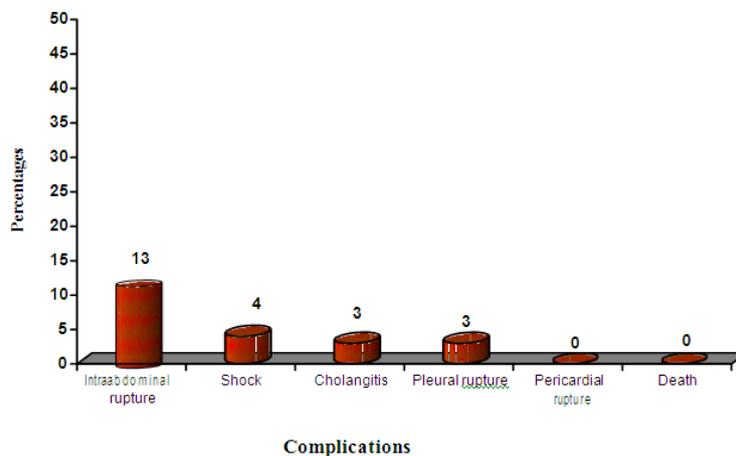
GRAPH 22 : CORRELATION OF ETIOLOGY WITH TYPE LIVER ABSCESS

✦ *Cryptogenic and Alcoholism was the most common Aetiology in Amoebic Liver Abscess which is statistically significant as P value <0.005 which is very significant.*

✦ *Cryptogenic, Alcoholism and Biliary Tract Disease, Tuberculosis was the most common Aetiology in Pyogenic Liver Abscess which is Statistically significant as P value <0.005 which is very significant.*

TABLE 42: COMPLICATIONS

Complications	Number of patients (n=100)	%	95%CI
Intraabdominal rupture and peritonitis	13	13.0	14.17-29.98
Shock	4	4.0	1.57-9.84
Cholangitis	3	3.0	1.0-8.46
Pleural rupture	3	3.0	1.0-8.46
Pericardial rupture	0	0.0	-
Death	0	0.0	-



GRAPH 23: COMPLICATIONS

- ✦ *The various complications in the 100 cases of liver abscesses were analysed.*
- ✦ *Intra abdominal rupture with peritonitis was seen in 13/100 (13.0%) of cases.*
- ✦ *Features of shock in 4 cases (4%), Cholangitis was seen in 3% of cases.*
- ✦ *Pleural rupture was seen in 3/100 (3.0%) of cases.*

IV. Discussion

Abscess of the liver is relatively rare. It has been described since the time of Hippocrates (400 BC), with the first published review by Bright appearing in 1936. In 1938, Ochsner's classic review heralded surgical drainage as the definitive therapy; however, despite the more aggressive approach to treatment, the mortality rate remained at 60-80%.¹

The development of new radiologic techniques, the improvement in microbiologic identification, and the advancement of drainage techniques, as well as improved supportive care, have decreased mortality rates to 5-30%; yet, the prevalence of liver abscess has remained relatively unchanged. Untreated, this infection remains uniformly fatal.

India being a tropical country and home to 400 million people harbouring *E.histolytica*, the causative organism of amoebic liver abscess, it assumes immense importance for thorough understanding of the same.

The rising incidence in alcoholics & immunocompromised individual has become a matter of grave concern as complications rate are high especially in this sub-group leading to increased morbidity and mortality.

The changing scenario in *incidence, diagnostic methods, treatment & complications* associated with liver abscess due to increasing percentage of *alcoholics and immunocompromised population*; the current serious problem in our country, has inspired me in doing an indepth study, regarding *Liver Abscess*, which assumes more importance in our country where rural population constitutes approximately 70% and therefore it mandates, appropriate & realistic guidelines to be drawn up for early diagnosis and change in management strategies, in order to reduce the morbidity and mortality associated with it.

AGE AND SEX INCIDENCE

Most of the patients who presented with Liver Abscess were in the middle age with patients in third to sixth decade accounting for 71.0% of the cases. Mean age of presentation is 47yrs, which is comparable to other Studies.

Studies	Mean Age[in years]
Shyam Mathur ⁵⁶	20 – 45 years (32.5 years)
Khee Siang Chang, Chin Ming ⁵⁷	47.6 years
Antonio Groggia ⁵⁸	16 – 78 years (45.3 years)
Present study	19 – 75 years (47 years)

Studies	Male	Female
Shyam Mathur ⁵⁶	90.0 %	10.0%
Indian Journal Of Surgery ⁵⁹	96%	04%
Present study	87.0%	13.0%

Present study shows a very high incidence of Liver Abscess in males [87.0%] as seen in other Indian studies like Shyam Mathur [90.0%] and Indian Journal Of Surgery [96.0%]

✦ DURATION OF ONSET

ONSET OF DISEASE	Sumit Kapadia, Dipesh Dattaroy et al ⁵⁹	Present Series
<7 DAYS (Acute onset)	-	Most patients (57%)
7days – 2 months (Subacute Onset)	Most patients	40%
>2 months (Chronic)	-	3%

The onset of the disease is subjected to great variations depending upon the type, location and quantity of liver abscess. It may be acute, insidious, clinically undetectable or fulminant form.

In our study, most patients (57%) presented with duration of onset < 7 days (acute) as compared to other Indian Study which had most cases as Subacute Onset.

✦ SYMPTOMS & SIGNS

Most of the patients who presented in this series presented with pain in Right Hypochondrium and Epigastrium [100%] and Fever [96.0%] which was more significant as compared to other studies listed below.

RUQ Tenderness (100.0%), Fever (96.0%), Hepatomegaly (54.0%) was common presentation in our series and was comparable to the studies listed below but Jaundice (27.0%) was more common clinical presentation compared to study done by Hyo Min Yoo et al (7.0%)

SYMPTOMS	Hyo Min Yoo et al ⁶⁰	Khee Siang, Ching Ming	Shyam Mathur	Present Series
Pain in Abdomen	85.0%	57.0%	80.0%	100.0%
Fever	71%	97.2%	70.0%	96.0%
Diarrhea	13%	-	7.0%	19.0%
SIGNS				
RUQ Tenderness	88%	-	80.0%	100.0%
Fever (37.3 ⁰ C)	93.0%	97.2%	-	98.0%
Hepatomegaly	41.0%	-	-	54.0%
Jaundice	7.0%	-	-	27.0%

✦ ALCOHOLISM IN CASES OF LIVER ABSCESS

Study	Alcoholism
Shyam Mathur et al	70%
Present Series	84.0%

Alcoholism was found to be the most consistent etiological factor in this study of liver abscess. 84/100 (84%) of the cases of this study were found to be alcoholics as compared to other study by Shyam Mathur et al where 70% of the cases were alcoholic which concludes Alcoholism has a strong association with liver abscess patients.

✦ ANALYSIS

OFLABORATORY INVESTIGATIONS

Laboratory Investigations	Hyo Min Yoo et al	Present Series
Leukocytosis (>10 x 10 ⁹ /L)	78.0%	76.0%
Alkaline Phosphatase (>115 IU/L)	55%	83.0%

Albumin (<3.0gm/dl)	68%	83.0%
Prothrombin Time (>20 sec)	14%	31.0%

The above table shows that following Lab. Investigations Leukocytosis, Raised Alkaline Phosphatase, Hypoalbuminaemia, Raised Prothrombin Time are the most important Laboratory Investigations in Diagnosing Liver Abscess.

Present series showed trends similar to those of other study listed above but Raised Alkaline Phosphatase Levels was the single most common Laboratory abnormality in our study for Diagnosis of Liver abscess.

✦ **Association of Diabetes with pyogenic liver abscess**

STUDY	DIABETES (RBS >200MG/DL)
World J Gastroenterol 2008 April 7; 14(13): 2089-2093 ⁶³	166/200 (83.0%)
PRESENT SERIES	20/30 (66.7%)

Association of Diabetes with pyogenic liver abscess in our series (6.7%) is comparable to other recent study like World J Gastroenterol 2008 April 7 (83.0%)

✦ **COMPLICATIONS**

Study	Complications
Hyo Min Yoo et al	59.0%
Present Series	13.0%

The various complications that arose in the patients with liver abscesses in this study were analysed. Complications like Intraabdominal rupture with peritonitis (13.0%), pleural rupture (4.0%), Pericardial rupture (0.0%) was much less as compared to Study by Hyo Min Yoo et al (59%) which is significant.

V. Conclusion

Liver abscess is a very common condition in India. India has 2nd highest incidence of liver abscess in world.

☞☞ Liver abscesses occurred most commonly between 30-60 years

☞☞ Most of the cases had an acute presentation

☞☞ Males were affected more than females.

☞☞ Pain abdomen was the most common symptom present in all 100 cases.

☞☞ Fever being the most consistently occurring symptom

☞☞ Alcohol consumption was the single most important etiological factor for causation of liver abscesses.

☞☞ Alkaline phosphatase is the most consistently elevated among all Liver Function Tests.

☞☞ Raised WBC count, Alkaline phosphatase level, Diabetes, Hypoalbuminaemia, Prolonged Prothrombin time were considered as the predictive factors of complicated (Ruptured) liver abscess in this study.

☞☞ Diabetes mellitus was more frequently associated condition in cases of liver abscess and especially Pyogenic liver abscess cases.

Cryptogenic was the most common aetiology in Amoebic liver abscess as well as in Pyogenic liver abscess.

☐ Peritoneal rupture was the most common complication associated with Liver abscess.

References

- [1]. Ochsner A, DeBakey M, Murray S. Pyogenic Abscess of the Liver II. An Analysis of Forty-Seven Cases with Review of the Literature. *Am J Surg.* 1938;XL:292-319.
- [2]. Kapoor OP. Amoebic liver abscess, 1st eds, SS Publishers, Bombay, 1999.
- [3]. Davis A, Pawloski ZS. Amoebiasis and its control : A WHO meeting. *Bulletin of WHO* 1985; 63: 417-426.
- [4]. Vaidya A, Ray D. Amoebiasis : The tropical scourge. *Science Today* 1982; 16(8): 21-26.
- [5]. Martinez Baez M. Biology of Entamoeba histolytica : Human parasitic diseases. 1986; 12(2): 12 43.

- [6]. Skandalakis' Surgical Anatomy John E. Skandalakis, Gene L. Colborn, Thomas A. Weidman, Roger S. Foster, Jr., Andrew N. Kingsnorth, Lee J. Skandalakis, Panajiotis N. Skandalakis, Petros S. Mirilas > CHAPTER 19.Embryology and Anatomy.
- [7]. Ganong's Review of Medical Physiology, Section 5 > Chapter 29. Transport & Metabolic Functions of the Liver > Table 29-1
- [8]. Surgery of the Liver, Biliary Tract, and Pancreas, Fourth editionLeslie H. Blumgart(Vol.1) page no: 31- Assessment of liver function in the surgical patient – R.D. SCHULICK

Dr.Avinash.T.R, et. al. "Correlation of Etiology, Clinical Features with Type of Liver Abscess and Complications of Liver Abscess." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(11), 2021, pp. 47-54.