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Original Research Article

EVALUATION OF FACTORS ASSOCIATED WITH COMPLICATIONS IN LIVER ABSCESSES

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ABSTRACT

Background: Liver abscess as an infectious space occupying lesion of the liver. Pyogenic and amoebic liver abscess is an infection that is emerging worldwide and that is associated with severe morbidity and considerable mortality. **Aim**: This study analyzes the predictive risk factors, clinical and socio-demographic features, complications and therapeutic management plan of liver abscesses patients.

Methods: this prospective cross sectional study was carried out in the department of surgery, in a tertiary care hospital, central India. A total of 135 cases, between 18-75 years of age, irrespective of sex, getting admitted in our department, during the period of study, diagnosed as liver abscess were included in the study. All patients were thoroughly examined and all relevant investigations were done. All complications and outcomes were observed.

Result: Majority of the cases were 45-60 years age group. Most of the participant was male. The complications of liver abscess were mainly developed in alcoholic male than female. 58.5% of abscess present in right lobe of liver. Duration of alcohol consumption, BMI and socio-economic status was not significantly associated with the complication, Most common clinical presentation were Fever, abdominal pain, tenderness and hepatomegaly. Raised total leukocyte count (>11000/comm), raised bilirubin (>2mg/dl) and increased liver enzymes were found in most of the cases. Most common complication was rupture of abscess in peritoneal and pleural cavity, peritonitis, Ascites and septic shock. Percutaneous aspiration combination with antibiotics has become the mainstay of treatment.

Conclusion: The knowledge of predictive risk factors of liver abscess can allows early and appropriate treatment to avoid complications**.** Percutaneous drainage with appropriate antibiotics was associated with low rates of morbidity and mortality

Key words: Liver abscess, complications, amoebic liver abscess, pyogenic liver abscess.

1. INTRODUCTION

Liver abscess is a major health concern in countries like India as complications associated with it are uniformly fatal [1]. Liver abscess can be defined as a suppurated collection in the hepatic parenchyma that may be of bacterial, parasitic or fungal [2].Based on the etiology, major types of liver abscess are amoebic liver abscess and pyogenic liver abscess [3]. Amoebic liver disease affects younger people compared to pyogenic liver disease. The

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amoebic liver tumor is more common in males but the pyogenic liver tumor has similar incidence of sex [4]. Pyogenic liver abscess (PLA) is a major life-threatening disease increasing worldwide, It has varied clinical features, currently; the epidemiology of PLA is geographically diverse, depending on the population prevalence, age, sex, and acquisition mode [5]. Amoebic liver abscess (ALA) is the most common extra intestinal form of invasive amoebiasis. As per a World Health Organization report, Entamoeba histolytica (EH) infections are prevalent throughout the tropical countries, with up to 50 million infections, and approximately 100 000 deaths occur each year, mostly from ALA [6]. The microbiology of pyogenic liver abscess varies greatly with geography recognized as an important factor. Worldwide, Escherichia coli is the most common culprit, followed by Klebsiella species, Streptococcus group, anaerobes and Enterococcus species [7]. Amoebiasis causes diarrhea, colitis and amoebic liver abscess in tropical countries. Simultaneous amoebic caecal perforation and amoebic liver abscess rupture is a rare complication of invasive amoebiasis with a higher rate of mortality [8]. Factors associated with increased mortality due to PLA include the following: age more than 65 years; male sex; presence of diabetes, malignancy, and liver or/and biliary disease; Klebsiella pneumoniae infections; multidrug resistance; polymicrobial or mixed anaerobic infections; gas-forming abscesses; abscess ruptures; multiloculated abscesses; metastatic infections; inappropriate initial antibiotics; Acute Physiology and Chronic Health Evaluation (APACHE) II scores more than 15; ICU stay; septic shock; respiratory failure with mechanical ventilation; and multiple organ failures [9]

Aims & objectives: The aims of this study were to analyze the factors that have prediction of risk of complications in a case of liver abscess.

2. MATERIAL AND METHODS

This was a prospective study conducted in the department of surgery in a tertiary care teaching hospital, central India, over a period of 2 years**.** All patients whom admitted in the our hospital and diagnosed (clinically as well as ultrasonographically) with liver abscess were enrolled in the study

Inclusion Criteria:

- All diagnosed patients of liver abscess
- Age ranged from 18 to 75 years

Exclusion Criteria:

- Complicated hydatid cyst/ Traumatic or ruptured Liver abscess
- Aged <18 or >75 years
- Immuno-compromised patients

The collected data were patient age, sex, status, socio-economic status, duration of hospitalization, etiopathogenesis, risk factors clinical manifestations, laboratory data and imaging at admission, comorbidities concomitant neoplasm, alcohol consumption and treatment procedures. Routine blood examinations included the following: complete blood count, serum biochemical tests (including fasting blood sugar, hemoglobin A1C, and liver and renal function), and high-sensitivity C-reactive protein.

Statistical Analysis: In the present study, statistical analyses of data were carried out using SPSS version 22. Numerical data were expressed as mean ± standard deviation. P value < 0.05 was considered significant

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3. RESULTS

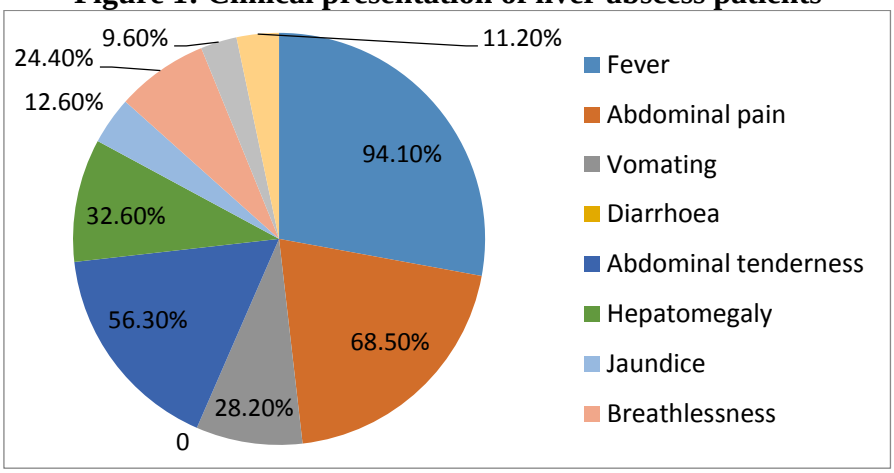
The baselines characteristics in all the participants and correlation of various factors in patients who developed complications and their statistical significance are shown in Table 1. Male patients and alcohol consumption was significantly associated with the complication of liver abscess.

Table 1: Baseline Characteristics of the study participants and cases with complication

Baseline characteristic		Total cases (N=135) (%)	Cases with Complication (N=55) (%)	P value
Age group (in years)	18-30	20 (14.8%)	3 (5.5%)	0.230
	31-45	36 (26.7%)	14 (25.5%)	
	45-60	54 (40%)	23 (41.8%)	
	61-75	25 (18.5%)	15 (27.2%)	
Gender	Male	106 (78.5%)	53 (96.4%)	**0.002**
	Female	29 (21.5%)	2 (3.6%)	
Alcohol consumption	Yes	87 (64.4%)	47 (85.5%)	**0.003**
	No	48 (35.6%)	8 (14.5%)	
Duration of years	<5 years	34 (25.2%)	9 (16.3%)	0.095
	5-10 years	59 (43.7%)	20 (36.4%)	
	>10 years	42 (31.1%)	26 (47.3%)	
Diabetes	Yes	76 (56.3%)	32 (58.2%)	0.811
	No	59 (43.7%)	23 (41.8%)	
Body mass index	Non-obese	64 (47.4%)	26 (47.3%)	0.986
	Obese	71 (52.6%)	29 (52.7%)	
Socio-economic status	Lower	42 (31.1%)	20 (36.4%)	0.373
	Middle	59 (43.7%)	18 (32.7%)	
	Upper	34 (25.2%)	17 (30.9%)	
Abscess location	Right lobe	79 (58.5%)	34 (61.8%)	0.893
	Left lobe	44 (32.6%)	16 (29.1%)	
	Both lobe	12 (8.9%)	5 (9.1%)	

The common clinical symptoms are fever, pain in abdomen, tenderness, nausea, vomiting, whereas hepatomegaly was common finding. detailed picture of clinical profile shown in figure:1.

Figure 1: Clinical presentation of liver abscess patients



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Majority of the patients (67.4%) had WBC count more than10, 000 and 44.9% had decreased Haematocrit (<36%). Low serum albumin (<2g/dL) in 54.1%, high ALP in 65.9%, high AST in 70.4%, High serum bilirubin (>2mg/dL) in 17.8% and a prolonged PT in 19.3% patient

Table 2: Abnormal laboratory parameters in study subjects

Parameters	Number	Percentage
Increased TLC (>10000 /mm3)	91	67.4%
Haematocrit (<36%)	62	45.9%
Total bilirubin (>2 mg/dl)	24	17.8%
Raised ALP (u/l)	89	65.9%
Raised AST (u/l)	95	70.4%
Raised ALT (u/l)	40	29.6%
Abnormal prothrombin time	26	19.3%
Decreased serum albumin	73	54.1%
Raised serum creatinine	38	28.1%

Of the 135 cases analyzed 55 cases developed complications. The common complication were Intra abdominal rupture & peritonitis, Ascites and septic shock Detailed list of complications are shown in Table 3.

Table 3: Development of complications in liver abscess patients

Complication	Number	Percentage
Intraabdominal rupture & peritonitis	43	31.9%
Rupture into pleural cavity	22	16.3%
Pericardial rupture	11	8.1%
Cholangitis	9	6.7%
Multiple organ dysfunction	10	7.4%
Septic shock	28	20.7%
hydrothorax/ pyothorax	17	12.6%
Ascites	37	27.4%
Bronchobiliary fistula	3	2.2%
Metastatic infection	22	16.3%
Mortality (death)	14	10.4%

Percutaneous drainage with medical management were the main stay of treatment of liver abscess.

Table 4: Distribution of therapeutic options used for patients with liver abscess

Treatment plan	Frequency (%)
Medical treatment alone	55 (40.7%)
Ponction-aspiration	9 (6.7%)
Percutaneous drainage	37 (27.4%)
Percutaneous drainage + thoracic drainage	2 (1.5%)
Surgery	32 (23.7%)

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4. DISCUSSION

In our study total of 135 cases of liver abscess were enrolled, majority of the cases belonged to the 45-60 years age group. Almost similar finding was seen by Chaudhary S, et al [10] and Ghosh S, et al [11]. Therefore it can be predicted that higher age groups are more prone to developing complications.

Present study found male predominance with significant association of complication of liver abscess and male. This may be due to consumption of alcohol higher in male then female, Concordant to Justo et al [12] and Makkar et al [13].

There is significant correlation between alcohol consumption and liver abscess seen in current study, also the risk of development of complications in a case of liver abscess in a chronic alcoholic was statistically significant (p<o.o5), our results are comparable with the Saha et al [14], and Raja M et al [15]. The invasive capacity of E. histolytica is facilitated by alcohol which is harmful to liver and by nutritional deficiencies leading to higher incidence of liver abscess in alcoholics.

No significant association was found between complication of liver abscess with duration of alcohol consumption, diabetes mellitus, socio-economic status and BMI, accordance with the Yeh P-Jet al [16].

In our study majority of the abscess occurs in right lobe of liver, consistent finding also reported by Khan R, et al [17] and Satish Kumar et al [18]. The main reason for the right lobe predilection in liver abscess is because of the streaming effect in portal circulation by which majority of the blood flows to the right lobe as compared to left lobe as it is supplied by superior mesenteric vein.

Most common clinical presentation was fever followed by abdominal pain, tenderness, vomiting and hepatomegaly seen in current study; these findings were in correspondence to many other studies: Singh et al [19] and N dong A, et al [20].

In our study Leukocytosis (>10000 /mm3)was seen in 67.4%. Similar trend had been seen by Christein et al [21]. Raised Serum bilirubin (>3 g/dl) along with elevated liver enzymes (ALT, AST and ALP) was observed in most of the patients, our findings comparable with the Kumar et al [22] and Faridi SA et al [23], reported hyper bilirubinemia was frequently associated with amoebic liver abscess.

A study done in Taiwan found the presence of gas-forming abscesses, high level of BUN and high APACHE II score (>15) at admission were independent prognostic factors for mortality in liver abscess [24].

Present study observed that common complications were rupture liver abscess into peritoneal and pleural cavity, plural effusion, Ascites, septic shock, metastatic infection and Cholangitis in liver abscess patients, similar results also reported by Bammigatti C et al [25] and AK Jha et al [26].

Percutaneous aspiration or pigtail drainage of the liver abscess in combination with antibiotics has become the main therapeutic modality for management of pyogenic liver abscesses reported in current study, concordant results shown by Lee et al [27] and Anita et al [28].

5. CONCLUSIONS

Ruptured liver abscess should be assessed carefully especially in patients with poor prognostic factors, which highlight the need for early diagnosis to further improve our results of management. The assessment of independent predictors may help in the early accurate

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management of liver abscess, minimized complication and reduces mortality of the patients.
Conflicts of interest: none
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