

**Original Article**

**Prospective study to analyze clinico-epidemiological profile of patients presenting with liver abscess at tertiary care centers**

Kapil Rampal<sup>1</sup>, Devendra K. Prajapati<sup>2</sup>, Meghna Sharma<sup>3</sup>, Shakti Pratap Singh<sup>4</sup>

**Abstract:**

**Background:** Liver abscess is an ancient disease bothering mankind since ages and continues to be a common health problem in India. Both of its subtypes i.e., amoebic and pyogenic, continues to pose serious challenge to the Indian health care system. **Aims and objectives:** To determine the demographic profile of patients, to assess type of liver abscess prevalent in the region and to assess etiological factors of the disease. **Methods:** Study was conducted in two tertiary care and referral hospitals in the Indian national capital region and a govt. hospital in Punjab from 01 July 2016 to 31 December 2019 and the patients were followed up till June 2020 with the last recruited patient getting a six month follow up. Diagnosis was confirmed by sonography and examination of aspirate. Positive routine bacteriological culture of the pus and a positive response to routine antibiotics made up for the pyogenic liver abscess category. **Results:** Liver abscess commonly affects middle aged males of low socioeconomic status. Diabetics and alcohol (both Indian made foreign liquor and the local country liquor) are biggest risk factors. Majority have raised leukocyte counts while Alkaline phosphatase is the most commonly deranged liver function test marker, raised to more than twice of the normal range in most cases. Right lobe involvement, right sided pleural effusion and raised right hemidiaphragm are seen in plain chest X-ray. Fever and pain abdomen are the most common presenting complaints. USG abdomen is an effective diagnostic modality that also serves to guide intervention procedures. **Conclusions:** Early diagnosis and timely intervention produces best results.

**Keywords:** Liver abscess, alcoholism, Pyogenic liver abscess, Amoebic liver abscess, Percutaneous aspiration.

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**Introduction**

Liver abscess is an ancient disease bothering mankind since ages and continues to be a common health problem in India. In both its subtypes i.e. amoebic and pyogenic, it continues to pose serious challenge to the Indian health care system. Worldwide amoebiasis is the 3<sup>rd</sup> most common cause of death amongst the parasitic diseases. Pyogenic liver abscesses are however common in patients with portal pyemia.<sup>1</sup> Incidence of diabetes in liver abscess cases has variously been described from 6-65%.<sup>2,3</sup> Both tropical and temperate countries are endemic for liver abscess with an

estimated 40-50 million people suffering from it. India records the 2<sup>nd</sup> highest incidence of liver abscess in the world.<sup>4</sup> Pyogenic liver abscess is a serious illness and also a diagnostic challenge.<sup>5,6</sup> Serological tests though useful have limited role as they stay positive for long.<sup>7</sup>

**Materials and Methods**

Study was conducted in two tertiary care and referral hospitals in the Indian national capital region and a govt. hospital in Punjab from 01 July 2016 to 31 December 2019 and the patients were followed up till June 2020 with the last recruited patient getting a six month follow up. Diagnosis

1. Kapil Rampal, Astd. Professor, Surgery GGSMCH, Faridkot (Pb),151203.
2. Devendra K. Prajapati, Astd. Professor, Surgery GRMC, Gwalior (M.P.).
3. Meghna Sharma, Resident Microbiology Department, GMC Amritsar (Pb.)143001.
4. Shakti Pratap Singh, Senior Resident, DDUH, New Delhi, 110064.

**Correspondence to:** Dr. Kapil Rampal, Surgery GGSMCH, Faridkot (Pb),151203.

**E-mail:** balkarankapil@gmail.com



**Figure 1:** USG showing Rt lobe liver abscess.

**Table 1.** Age distribution of patients with liver abscess.

Age	ALA	PLA	TOTAL
<20 years	-	04 (2.9%)	04 (2.9%)
21-30years	22 (16.4%)	18 (13.43%)	40 (29.85%)
31-40years	16 (11.94%)	08 (5.97%)	24 (17.91%)
41-50years	18 (13.43%)	06 (4.47%)	24 (17.91%)
51-60years	09 (6.71%)	09 (6.71%)	18 (13.43%)
61-70years	11 (8.2%)	04 (2.9%)	15 (11.19%)
71-80years	03 (2.2%)	04 (2.9%)	07 (5.22%)
>81years	-	02 (1.49%)	02 (1.49%)
TOTAL	79 (58.95%)	55 (41.05%)	134

**Table 2.** Sex distribution of patients with liver abscess.

Sex	ALA	PLA	TOTAL
Male	76	44	120(89.55%)
Female	03	11	14(10.45%)

**Table 3.** Socio-economic status as per modified Kuppaswamy (2020) index of patients with liver abscess.

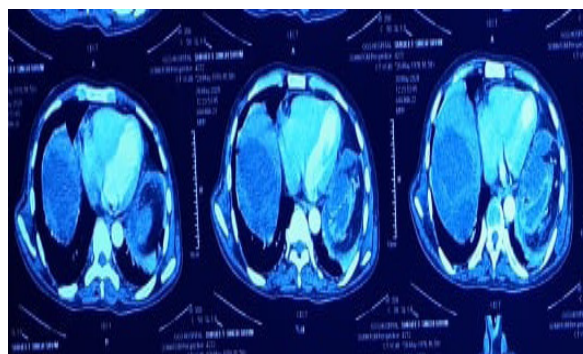
Class	ALA	PLA	
I and II	-	-	nil
III	12	16	28(20.89%)
IV	44	20	64(47.76%)
V	32	10	42(31.34%)

**Table 4.** Association of pyogenic liver abscess with diabetes.

Diabetes	ALA	PLA	TOTAL
Yes	18(22.78%)	42(76.36%)	60(44.77%)
No	61(77.21%)	13(23.63%)	74(55.22%)

**Table 5.** Alcohol intake in patients with liver abscess.

Alcohol		ALA	PLA	TOTAL
Yes	IMFL/FL	22	8	108(80.59%)
	LOCAL	48	30	
No		14	12	26(19.4%)



**Figure 2:** CT showing Rt lobe liver abscess.

was confirmed by sonography and examination of aspirate. Positive routine bacteriological culture of the pus and a positive response to routine antibiotics made up for the pyogenic liver abscess category.

Anchovy sauce pus, negative microbiological culture and response to antiamoebic treatment completed the amoebic liver abscess category. All consenting adults and non-adults for whom the guardians consented were included in the study. Non-consenting individuals, burst liver abscess cases patients, non-compliant individuals who did not complete the treatment, lost on follow up cases, cancer patients, immuno-compromised cases, pregnant females, and death cases were excluded from the study. *Modified Kuppaswamy scale 2020* used to assess the socio-economic status of the patients. Those taking alcohol at least three days a week irrespective of the quantity consumed were included in the regular alcoholic category. Complete blood counts, liver function tests, chest X-rays and ultrasound abdomen were performed. Pus aspirated was subjected to routine bacterial culture. Serological studies were not performed due to non-availability and cost constraints. CT scans were limited to cases of diagnostic dilemma or where complications were suspected. Figure 1 and figure 2 shows typical sonographic and CT scan findings, respectively.

Temperature more than 38.5°C was taken as fever, pulse more than 90 beats per minutes as tachycardia and respiratory rate of more than 20 breaths was taken as tachypnoea. Laboratory testing was performed through standardized procedures.

### Results and Observations:

Liver abscess commonly affects middle aged males. As shown in Table 1 and Table 2, 89.55% of the patients were males. More than 80% of patients are within the age limits of 21 to 50 years. The oldest patient who reported to us aged 84 years while the youngest patient was a 11-year-

**Table 6.** Lab parameters of patients with liver abscess.

Parameter		ALA	PLA	TOTAL
Hemo globin	>10gm%	56	44	100(74.62)
	<10gm%	23	11	34(25.37)
TLC	Upto 11000/mm <sup>3</sup>	08	06	14(10.44%)
	More than 11000/mm <sup>3</sup>	71	49	120(89.55%)
SGPT	In Range	36	20	56(41.79%)
	Raised	43	35	78(58.20%)
ALP	in Range	7	13	20(14.92%)
	Raised	72	42	124(92.53%)
INR	in Range	18	14	32(23.88)
	Raised	61	41	102(76.11)
Total bilirubin	<2.0MG%	68	50	118(88.05%)
	>2.0MG%	11	5	16(11.94%)
Alubumin	>3gm%	58	36	94(70.014%)
	<3gm%	21	19	40(29.85%)

**Table 7.** Sonogram of patients with liver abscess.

Ultrasound Abdomen		ALA	PLA	TOTAL
Right lobe	single	44	14	91(67.91%)
	multiple	13	20	
Left lobe	single	10	06	18(13.43%)
	multiple	2	-	
Bilateral		10	15	25(18.65%)

**Table 8.** X-ray chest of patients with liver abscess.

X-RAY CHEST		YES	NO
PLEURAL EFFUSION	RT	44(32.83%)	64(47.76%)
	LT	08(5.97%)	
	BILATERAL	18(13.43%)	
RAISED RT HEMIDIAPHRAGM		39(29.10%)	95(70.89%)

**Table 9.** Clinical features of patients with liver abscess.

Symptoms	Numbers	Percentage
Fever	128	95.22
Pain abdomen	110	82.08
jaundice	26	19.4
Chest like cough,pleurisy	28	20.89
Diarrhoea	20	14.92
Unconsciousness	-	-
<b>Signs</b>		
Fever 38.5 °C	128	95.22
Abdominal tenderness	125	93.28
Icterus	30	22.38
Hepatomegaly (including on ultrasound)	124	95.55
Tachycardia	130	97.01
Tachypnoea	74	55.22
Shock	-	-

old young male. Over 2/3rd cases belonged to class IV and V of *modified Kuppaswamy scale* of socioeconomic status as is shown in Table 3. No cases were reported from the class I and II.

44.77% patients are diabetics and the association of pyogenic liver abscess with diabetes is 76.36% as is depicted in Table 4. Alcohol (both Indian made foreign liquor and the local country liquor) comes out as single largest risk factor with 80.59% association as shown in Table 5. As is shown in Table 6 majority has raised leucocyte counts and SGOT levels are high in 58.20% of liver abscess. Alkaline phosphatase is the most commonly deranged liver function test marker, raised to more than twice of the normal range in 92.53% cases. One fourth of all cases are anemic and 29.85% show poor serum protein levels. Raised serum bilirubin levels are seen only in 11.94% cases. 76% cases showed INR of more than 1.5. Most cases show leucocytosis and a highest count of 40000/mm<sup>3</sup> were recorded in a 32 year male. Right lobe involvement predominates with involvement in 67.91% cases while bilobar involvement is seen in 18.65% cases, shown in Table 7. Largest volume of 1100 cc has been recorded from a 30 years old alcoholic male. Right sided pleural effusion is seen in 32.83% cases while pleural effusion of both or either side is seen in 52.23% cases. 29.10% cases had raised right hemidiaphragm on plain chest X-ray. The distribution of findings on chest X-ray are shown in Table 8. Fever and pain abdomen are the most common presenting complaints. Tenderness in right hypochondria with raised body temperature is seen in more than 90% cases. Other symptoms and signs being jaundice, chest complaints like pleurisy and cough, tachycardia, tachypnoea, tender hepatomegaly and localized or generalized peritonitis shown in Table 9.

**Abbreviations:** ALA: amoebic liver abscess; PLA: pyogenic liver abscess; TLC: total leucocyte counts; SGOT: serum glutamic oxaloacetic transaminase; SGPT: serum glutamic pyruvic transaminase; ALP: alkaline phosphatase; INR: international normalized ratio.

### Discussion

Most of the patients were males from the middle age group and this is in coherence with the studies by Antonio Gorgia.<sup>8</sup> Authors have established a correlation between lower socioeconomics classes and both types of liver abscess.<sup>5,9-11</sup> Das et al. brought out a stronger association of ALA with diabetes however we could establish a stronger

relation between diabetes and PLA.<sup>5</sup> Alcohol stands out as single largest predisposing factor and this has been highlighted by majority of the authors.<sup>12</sup> Raised TLC, ALP and INR has been consistent in all studies and also is documented in standard textbooks.<sup>1,13</sup> Anemia and hypoalbuminemia were found in 25.37% and 29.85% cases in our study. This may have been influenced by the general nutritional pattern in our areas. Chaudhary et al. had reported a higher prevalence of hypoalbuminemias.<sup>9</sup> Ultrasound and plain X-ray chest were performed and had diagnostic yield of more than 90%. We reserved CT scans to cases with suspected complications like rupture to peritoneal or pleural cavity. Ultrasound is helpful in showing the lobe involved, size and number of lesions and also as guide for aspiration of contents. Majority of single abscesses were ALAs, and right lobe was involved in 67.91% cases. Bilateral lobar involvement was seen in 18.6% cases. Dominance of right lobe involvement is consistent with other studies but bilobar involvement in our study is higher than that reported by some other authors.<sup>4,5,14</sup> Right sided pleural effusion was found in 32.83% cases that is less than that reported by Channanna et al. but gross incidence of abnormal X-ray chest is similar<sup>4</sup>. Fever and pain abdomen are most common clinical features and right upper abdominal tenderness commonest abdominal sign. The findings were coherent with Seeto and Rocky et al.<sup>15</sup> We used ultrasound guided needle aspiration and pig tail catheter placements

as mainstay of treatment. This has been fairly established by Singal et al.<sup>16</sup> They highlighted needle aspiration in small abscesses and catheter drainage in large abscesses as the safest and best modality. Haque R et al. had brought out a rare case of tubercular liver abscess however we did not encounter similar scenario in our study.<sup>17</sup>

### **Conclusion**

Liver abscess is a fairly common condition in India. Amoebic liver abscess is more prevalent than pyogenic liver abscess. Middle aged alcoholic males from lower socioeconomic strata are more commonly affected. Fever and right upper abdomen pain are most common symptoms. Right lobe of liver is more commonly involved. Basic clinical examination, lab parameters, chest X-ray and ultrasound abdomen form the mainstay of management. Early diagnosis and timely intervention produce best results.

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**Ethical approval issue:** It is an observational study; ethical approval issue is not needed.

**Authors's contribution:** Data gathering and idea owner of this study: K. Rampal, D.K. Prajapati, M. Sharma, S.P. Singh; Study design: K. Rampal, D. K. Prajapati; Data gathering: K. Rampal, D.K. Prajapati, S.P. Singh; Writing and submitting manuscript: K. Rampal, D.K. Prajapati, M. Sharma; Editing and approval of final draft: K. Rampal, D.K. Prajapati, M. Sharma.



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