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CLINICAL PROFILE AND MANAGEMENT OF LIVER ABSCESS: AN OBSERVATIONAL STUDY

General Surgery

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ABSTRACT

Background: Hepatic abscess is purulent matter encapsulated in the parenchymal cells of liver and can get contaminated by bacteria, fungi, and parasites in microorganisms. The present study is conducted to study the different outcome of liver abscess in terms of medical management, surgical management during hospital stay. **Methods:** The data for this observational study was obtained from 50 patients diagnosed as cases of Liver abscess and undergoing treatment after the approval of the institutional ethics committee. Study was carried out at Nkp Salve Institute of Medical Science, Nagpur during the period of 1st November 2019 to 31st October 2021. **Results:** The majority of cases belong to age groups of 31-40 and 41-50 years of age with male predominance 32(64%). The majority of patients presented with amoebic abscess 30(60%). Among pyogenic liver abscess patients most frequent bacteria involved in pathogenesis is E coli 9(18%). Right lobe of liver is commonly involved 45(90%).Ultrasonography of Abdomen is accurate and cost-effective in diagnosis of liver abscess. Among the liver segments the segment VII 23(46%) is commonly involved segment. Majority of patients managed by pigtail aspiration 32(64%) followed by conservative management 14(28%) and pigtail catheterization in 4(8%). **Conclusions:** In this study majority of patients presented with Amoebic liver abscess with equal involvement of 3rd and 4th decade. Ultrasonography guided percutaneous aspiration is superior to conservative management in treatment of liver abscess.

KEYWORDS

Liver abscess, Amoebic Liver Abscess, Pyogenic Liver Abscess, Ultrasonography, Pigtail Aspiration, Pigtail Catheterization.

INTODUCTION:

Hepatic abscess is purulent matter encapsulated in the parenchymal cells of liver and can get contaminated by bacteria, fungi, and parasites in microorganisms.[1]

There are a variety of bacteria that can cause an abscess in the liver.. Both the blood and bile ducts are potential routes for bacteria to enter the liver. There are a number of causes for a liver abscess, but gallstones, intestine infections, and appendicitis are the most common. It is also possible for bacteria to enter the liver through direct trauma or during liver-related procedures.[2]A liver abscess can also be caused by a parasitic infection, most commonly an amoeba . Overcrowding and poor sanitary conditions are conducive to this infection, which is also known as amebiasis. Eating or drinking tainted food or water can spread the disease.[22] A fungus or other infectious organism may cause a liver abscess in extremely rare cases. When the immune system is weakened, these organisms are more likely to cause problems.[3]

Single or multiple pyrogenic liver abscesses are possible. In a study, the right lobe was found to be impacted in 74% of instances, the left lobe in 16%, and both in 10% of cases. The most common cause of cholangitis is stones, strictures, or malignancy, however diverticulitis, appendicitis, Crohn's disease, and perforated peptic ulcers are also common.[4]

In a study, the right lobe was found to be impacted in 74% of instances, the left lobe in 16%, and both in 10% of cases. The most common cause of cholangitis is stones, strictures, or malignancy, however diverticulitis, appendicitis, Crohn's disease, and perforated peptic ulcers are also common.[4] A clogged biliary stent or liver biopsy-related iatrogenicity are two possibilities. Other causes include dental infection and bacterial endocarditis. In a study conducted in France, 18.4% of cases had no clear cause. [5] The immunocompromised are more likely to suffer from it. Adults with liver abscesses in France were found to have diabetes in 17.5 percent of cases. 30 Cirrhosis of the liver is a major contributor to the disease.[6]

METHODS:

The data for this observational study was obtained from 50 patients diagnosed as cases of Liver abscess and undergoing treatment after the approval of the institutional ethics committee. Study was carried out at a tertiary care academic hospital during the period of 1st November 2019 to 31st October 2021

Written and informed consent was acquire from each participant in her own language.

The demographic details such as age in years, gender, BMI was recorded. A detailed history of pain in right upper abdomen with duration, fever, vomiting, constipation or loose stools, jaundice, past medical or surgical history with co-morbid condition such as hypertension, diabetes mellitus, bronchial asthma was recorded. Patients vitals such as temperature (degree Fahrenheit in axillary region), heart rate(as recorded in beats/min), respiratory rate(cycles/min) and blood pressure(supine position in mmHg).

Patients were examined as per the case record form and abdominal finding such as nature of pain, duration of pain, presence and absence of tenderness, presence or absence of rebound tenderness, presence and absence of guarding and rigidity.

Patients were examined for free fluid in abdomen and auscultated for bowel sounds. Patients were undergone blood investigations like hemoglobin level, total leucocyte counts, platelet counts, random blood sugar levels, HIV and HBsAg and special investigations like LFT, Pus for culture and sensitivity for pyogenic abscess, Amoebic serology test was performed for amoebic abscess.

Imaging modalities like USG abdomen and pelvis and Computerized Tomography of abdomen and pelvis on were used . Management of the patients were discussed under the Conservative management(IV Antibiotics), USG guided Pigtail Aspiration, USG guided Pigtail Catheterisation .

Inclusion Criteria:

- All patients diagnosed with liver abscess on the basis of investigations supported by Ultrasonography Abdomen OR Computed tomography Scan.

Exclusion Criteria:

1. 1.Patient less than 18 years of age.
2. Patient not consenting to join the study or get investigated or treated.

RESULTS:

Table 1: Distribution of Cases according to Sociodemographic Variable Age

Age (Years)		Frequency	Percent
	18-20	1	2%
	21-30	2	4%
	31-40	22	44%
	41-50	22	44%
	50-60	3	6%
	Total	50	100%

Majority of cases belong to age groups of 31-40 and 41-50 years of age with frequency of 22(44%) each, followed by >50 years 3(6%), 21-30 years 2(4%) and least among <20 years age group 1(2%).

Table 2: Distribution of Cases according to Sociodemographic Variable Gender:

Gender		Frequency	Percent
	Male	32	64.0
	Female	18	36.0
	Total	50	100.0

Majority of cases were Males 32(64%), followed by females 18(36%).

Table 3: Frequency Distribution of Symptoms among Cases

Symptoms		Frequency	Percentage %
Pain Abdomen	Absent	3	6
	Present	47	94
Fever	Absent	6	12
	Present	44	88
Anorexia	Absent	10	20
	Present	40	80
Nausea and Vomiting	Absent	27	54
	Present	23	46
Diarrhoea	Absent	26	52
	Present	24	48
Cough	Absent	38	76
	Present	12	24
Weight Loss	Absent	23	46
	Present	27	54

Most frequently associated symptom was Pain abdomen 47(94%), followed by fever 44(88%), Anorexia 40(80%), Weight loss 27(54%), Diarrhoea 24(48%), Nausea and Vomiting 23(46%) and least frequent symptom among patients is cough 12(24%).

Table 4: Frequency Distribution of various Chronic Diseases among Cases

Chronic Diseases		Frequency	Percent
	No	31	62.0
	Hypertension	8	16.0
	Diabetes	11	22.0
	Total	50	100.0

Among patient's majority are not having any chronic disease, followed by Diabetes 11(22%) and Hypertension 8(16%) Respectively.

Table 5: Frequency Distribution of Various Signs of Liver Abscess among Cases

Signs		Frequency	Percentage %
Tachycardia	Absent	04	08
	Present	46	92
Tenderness	Absent	04	08
	Present	46	92
Pallor	Absent	31	62
	Present	19	38
Jaundice	Absent	38	76
	Present	12	24
Hepatomegaly	Absent	27	54
	Present	23	46
Splenomegaly	Absent	50	100
	Present	0	0
Ascites	Absent	50	100
	Present	0	0
Pleural Effusion	Absent	50	100
	Present	0	0

The following was the frequency of sign of Liver abscess among patients in descending order Tenderness 46(92%), Hepatomegaly 23(46%), Pallor 19(38%), jaundice 12(24%).

Table 6: Frequency Distribution of Infected Lobes of Liver among Cases

Lobe of Liver		Frequency	Percent
	Right	45	90
	Left	5	10
	Total	50	100.0

Majority of liver abscess cases have abscess in right lobe of liver with frequency of 45(90%)and only 5(10%) in Left lobe of liver.

Table 7: Frequency Distribution of Number of Abscesses among Cases

Number of Abscess		Frequency	Percent
	Solitary	40	80
	Multiple	10	20
	Total	50	100.0

Majority of liver Abscess cases have solitary abscess 40(80%) and only few 10(20%) have multiple abscesses.

Table 8: Frequency Distribution of Segments of Liver among Cases

Segments Infected		Frequency	Percent
	VII	23	46
	VI	07	14
	V	05	10
	IV	05	10
	VI+VII	06	12
	V+ VI	04	08
	Total	50	100

Most frequently infected segment of liver was seventh segment 23(46%) followed by sixth segment with 7(14%), combination of sixth and seventh segment with 6(12%), fifth and fourth segment with 5(10%) each and least affected segment is combination of fifth and sixth segment 4(8%).

Table 9: Frequency Distribution of Abscesses Management Procedures among Cases

Management		Frequency	Percent
	Conservative Management	14	28%
	Pigtail Aspiration	32	64%
	Pigtail Catheterization	4	8%
	Open surgery procedure	0	0%
	Total	50	100.0

Most frequently performed Abscess management procedure was conservative management 14(28%) followed by pigtail aspiration 32(64%) and pigtail catheterization in 4(8%). No open surgery procedure was performed.

Table 10: Frequency Distribution of Abscesses Size among Cases

Abscess size (cms)	Frequency	Percent
<5	12	24%
>5	38	76%
Total	50	100%

Majority of abscess size among cases is <5 cms with frequency of 12 (24%) followed by >5 cms with frequency of 38(76%).

Table 11: Frequency Distribution of Various Microorganisms Infecting Cases

Microorganisms Variables		Frequency	Percentage %
Pyogenic	Absent	36	72
	Present	14	28
Amoebic Serology +ve	Absent	20	40
	Present	30	60
Fungal Aetiology	Present	0	0
AFB Positive	Present	0	0

Among Liver abscesses majority were of Amoebic serology +ve patients in nature 30(60%) followed by pyogenic 14(28%) and no fungal aetiology and AFB positive and remaining 6 abscess showed no growth.

Table 12: Frequency Distribution of various Bacteria causing Abscesses

Bacterial microorganisms		Frequency	Percentage %
E. coli	Absent	41	82
	Present	9	18

Klebsiella	Absent	45	90
	Present	5	10
No Growth		6	12

Among pyogenic abscess patients most frequent bacteria involved in pathogenesis was E coli 9(18%) followed by Klebsiella 5(10%). Out of 50 cases, 30 are amoebic serology positive and 14(28%) are of pyogenic in nature and remaining 6(12%) abscesses showed no growth.

Table 13: Frequency Distribution of HIV Positive among Cases

HIV		Frequency	Percent
	Absent	48	96.0
	Present	2	4.0
	Total	50	100.0

Out of 50 cases only 2(4%) are tested HIV positive, while remaining 48(96%) are HIV Negative.

Table 14: Frequency Distribution of Hepatitis patients among Cases

HBsAg		Frequency	Percent
	Absent	47	94.0
	Present	3	6.0
	Total	50	100.0

Out of 50 cases only 3(6%) are tested HBsAg positive, while remaining 48(96%) are HBsAg Negative.

Table 15: Frequency Distribution of various Lab Parameters among Cases

Lab Parameters	Mean	Standard Deviation
Haemoglobin(gm%)	10.8300	1.02425
TLC	13920	3211
Platelet count (Lakhs)	1.6000	.35743
RBS	155.3000	27.08886
Bilirubin	1.1600	.46642
SGOT	75.6600	15.89970
SGPT	65.5200	14.66669
ALP	649.2400	169.15656

Among 50 cases of Liver Abscess the following were various lab parameters Mean Haemoglobin 10.8 with Standard deviation of 1.024, Mean TLC is 13920 cells with standard deviation of 3211, Mean platelet count was 1.6 lakhs with standard deviation of 0.357 lakhs, Mean bilirubin 1.16 with standard deviation of 0.466, Mean RBS was 155.3 with standard deviation of 27.08, Mean SGOT is 75.66 with standard deviation of 15.89, Mean SGPT was 65.52 with standard deviation of 14.66 and Mean Alkaline phosphate was 649.2 with standard deviation of 169.15.

DISCUSSION:

Early diagnosis of liver abscess is essential to avoid life threatening situations. Therefore, it is very important for prompt diagnosis and appropriate management at the earliest.

The present observational study carried out at a tertiary care centre. All patients presented with right upper abdomen pain with fever and on USG found to contain liver abscess were enrolled in study. A sample size of 50 patients with liver abscess above 18 years of age were included in the study. Patients less than 18 years of age and not willing to participate in study were excluded.

A informed written consent was obtained from the participant patient or his/her relatives in the local language. Ethical clearance for the study was obtained from ethical committee of institute. All the patients were investigated for basic investigations like CBC, LFT, KFT, Chest Xray, Ultrasound scan of abdomen and CECT Abdomen were performed.

In the present study, it was found that most of cases belong to age groups of 31-40 and 41-50 years of age with frequency of 22(44%) each, followed by >50 years 3(6%), 21-30 years 2(4%) and least among 18-20 years age group 1(2%) with mean age of 41.23 ±14.28 years.

These finding are consistent with Soumik Ghosh et al [7] observed mean age of patients was 41.13 years. (range:19 to 78 years) and Naresh Pal et al[8] observed mean age of patients was 43.72 years.

Indian data show predominant male involvement; Mukhopadhyay et al.[9] reported male to female ratio to be 7 **:** 1 and 11 **:** 1, respectively.

In the present study, the distribution of patients according to co-morbidities showed that majority of patients had diabetes mellitus 11(22%) followed by hypertension 8(16%). Alcohol consumption was observed in 21(42%) patients. In the study by Mukhopadhyay et al. [9] 61.11% of patients were consuming alcohol.

Alcohol consumption in 46.5% and 84% reported in Sharma N et al[10] and RK et al[11] respectively. Alcohol reduces immunity, diminish kuppfer cell activity and repress cell mediated and humoral immunity against Entamoeba histolytica.

The majority of patients presented with Pain abdomen 47(94%), followed by fever 44(88%), Anorexia 40(80%), Weight loss 27(54%), Diarrhoea 24(48%), Nausea and Vomiting 23(46%) and least frequent symptom among patients is cough 12(24%).

Tachycardia 46(92%) and Tenderness 46(92%) followed by Hepatomegaly 23(46%), Pallor 19(38%) and Jaundice 12(24%) were the signs present in this study.

Similar findings were seen in Soumik Ghosh et al[7] study where abdominal pain was accounts for (99%; *n* = 198) followed by fever (94%). Tenderness and hepatomegaly was the most common signs.

In the study by Naresh Pal et al [8] most of patients presented with pain in abdomen (91.38%), tenderness (82.97%) and pyrexia (82.97%). Eight (17.02%) patients with concurrent respiratory complains present.

The findings are consistent with Amit Ojha et al [12] having fever 68 patients [93.1%], reduced appetite was seen in 46 patients [63.0%], malaise was present in 29 patients [39.7%], weight loss and diarrhea was present in 10 patients each [30.1%], other symptoms like nausea and vomiting and cough were less common and Alam F, et al[13] in their study showed amoebic liver abscess patients presented with fever, abdominal pain and dysentery was 98.89%, 97.78% and 7.78% respectively.

In the present study, it was observed that majority of patients presented with amoebic liver abscess 30(60%) followed pyogenic liver abscess 14(28%) These findings are consistent with Soumik Ghosh et al[7] study where etiological analysis of liver abscess (LA) revealed that 69% were of amoebic origin, 18% of pyogenic , 4% of mixed amoebic and pyogenic process , 7.5% of tubercular and 1.5% of fungal infections and Amit Ojha et al[12] in a study on liver abscess clinical profile observed amoebic liver abscess accounts for 52 and the pyogenic liver abscess were 21.

Present showes that majority of patients had abscess size among cases is >5 cms with frequency of 38 (76%) followed by <5 cms with frequency of 12(24%).

In study by Naresh Pal et al [8] it was observed that 12.76% patients having abscess <5 cm and 87.23% with >5cm managed by metronidazole along with pigtail aspiration of liquified abscess.In the present study most of the of the patients presented with solitary abscess 40(80%) and only few 10(20%) have multiple abscesses is consistent with Soumik Ghosh et al[7] where majority of patients had solitary presentation (65%) and Naresh Pal et al[8] showing solitary abscess was present in (76.59%) of patients and multiple abscesses were present in 11 patients.

The distribution of patients according to lobe involved of abscess observed that most frequently infected segment of liver is seventh segment 23(46%) followed by sixth segment with 7(14%), combination of sixth and seventh segment with 6(12%), fifth and fourth segment with 5(10%) each and least affected segment is combination of fifth and sixth segment 4(8%).

In the present study majority of liver abscess cases have abscess in right lobe of liver with frequency of 45(90%) and only 5(10%) in Left lobe of liver. Similar findings were seen in Soumik Ghosh et al[7] study where Segemnt VII was most commonly involved (35%). In Naresh Pal et al[8] it was observed that majority of the abscesses were situated in right lobe (72.34%) along with four patients had abscesses in both lobe of liver.

In the study by Amit Ojha et al[12] right lobe was more commonly

involved in 57[78%] patients, left lobe involvement in 10[13.6] patients and both lobes were involved in only 6[3.2%] patients.

In the present study, it was observed that anemia present among 19 (38%) patients, raised total Leucocyte Count in 43 (86%) patients, raised neutrophil 43(86%), raised SGOT 41(82%) and raised SGPT 42(84%).

Similar findings were seen in Soumik Ghosh et al[7] study where anemia seen in 40.5% patients with liver abscess, raised total Leucocyte Count in 82% patients and raised SGOT in 47% patients. this finding was in accordance to present study.

In the study by Naresh Pal et al[8] it was observed that 13 (27.65%) patients were anemic and (70.21%) patients had raised WBCs . Eight (17.02%) patients had serum bilirubin>1.2gm%, (12.76%) patients had raised SGOT/SGPT, (6.38%) had elevated alkaline phosphatase The distribution of patients according to management showed that majority of patients managed by pigtail aspiration 32(64%) followed by conservative management 14(28%) and pigtail catheterization in 4(8%). No open surgery procedure is performed.

Similar findings were seen in Soumik Ghosh et al [7] study where 79% of the patients had pigtail aspiration and underwent pigtail drainage in 17% . Surgical management was performed in 4%patients for managing rupture.

Amit Ojha et al [49] found that 39(53.4%) patients were treated by both antibiotics and USG guided percutaneous needle aspiration.

In the present study, mean duration of hospital stay among patients is 5.88 days with standard deviation of 1.74 days and mean treatment time is 19.96 days with standard deviation of 5.15 days.

Amit Ojha et al [12] observed that over all hospitalization of patients of liver abscess was for 8 to 15 days in majority of patients. Few required to stay for 21 day or more.

Among Liver abscesses majority are of Amoebic serology +ve patients in nature 30(60%) followed by pyogenic14(28%) and no fungal aetiology and AFB positive and remaining 6 abscess showed no growth.

Among pyogenic abscess patients most frequent bacteria involved in pathogenesis is E coli 9(18%) followed by Klebsiella 5(10%). Out of 50 cases, 30 are amoebic serology positive and 14(28%) are of pyogenic in nature and remaining 6(12%) abscesses showed no growth. Out of 50 cases only 2(4%) are tested HIV positive, while remaining 48(96%) are HIV Negative. Out of 50 cases only 3(6%) are tested HBsAg positive, while remaining 48(96%) are HBsAg Negative.

Only 25% of the patients' pus for culture was positive, according to Amit Ojha et al [12] Staphylococci, Pseudomonas, and E coli were the most prevalent species found in positive cultures.

CONCLUSION

In this study majority of patients presented with Amoebic liver abscess with equal involvement of 3rd and 4th decade. Among pyogenic liver abscess patients most frequent bacteria involved in pathogenesis is E coli 9(18%).

Ultrasonography of Abdomen is accurate and cost-effective in diagnosis of liver abscess. Among the liver segments the segment VII 23(46%) is commonly involved segment. Right lobe of liver is commonly involved 45(90%).

Ultrasonography guided percutaneous aspiration is superior to conservative management in treatment of liver abscess.

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