Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/14601
DOI URL: http://dx.doi.org/10.21474/IJAR01/14601

RESEARCH ARTICLE

PROSPECTIVE & COMPARATIVE STUDY OF VARIOUS TECHNIQUES USED IN THE MANAGEMENT OF LIVER ABSCESS IN THE BUNDELKHAND AREA

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Manuscript Info

Manuscript History
Received: 25 February 2022
Final Accepted: 27 March 2022
Published: April 2022

Key words:-
Liver Abscess, Percutaneous Catheter Drainage, Percutaneous Needle Aspiration, Laparotomy

Abstract

Background- This study was designed to determine the frequency of various clinical features in liver abscess and to evaluate the outcome of patients treated by medical management or surgical intervention in terms of hospital stay, cavity reduction time, cost and complications.

Method- This is prospective comparative study of 85 patients, presented in in outpatient and emergency department of this hospital with the clinical features of liver abscess during the course of 1.5 years (january 2020 to june 2021) were included. Patients divided in 4 groups on the basis of usg , patients having cavity size < 5cm were included in group A (n=10) and subjected to conservative management only, patients having cavity size > 5cm underwent percutaneous drainage either by needle aspiration group B (n=21) having volume <100ml or by catheter drainage group D (n=39) having vol>100ml with appropriate antibiotic. Patients with ruptured cavity and signs of peritonitis were included in group C (n=15) and laparotomy was done.outcome of the treatments was evaluated in terms of duration of hospital stay, 50% reduction of cavitysize, total /near total reduction of cavity size, success rate, complication rate and cost. ANOVA test was used to analyze the parameters and determine the results.

Result- The most common signs and symptoms were, abdominal pain and right hypochondriac tenderness present in 100% and 78.8% of cases respectively. The success rate of catheter drainage is significantly better (>90%) than other groups (p=0.04) and this group also showed earlier 50% cavity reduction time 7. 4 days, complete cavity reduction time 22.4 days least hospital stay 9.7 days, significantly low complication rate 10.2% than others (p=<0.005) and is most cost effective with avg cost of Rs 2100.

Conclusion- Among all the interventions percutaneous pig tail insertion with antibiotic coverage is the best way to treat large liver abscess with thick pus. In case of ruptured liver abscess open surgical method is ideal.

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Introduction:-

Liver abscess continues to be a major diagnostic and therapeutic challenge to the medical fraternity. It is a life threatening and a potentially serious condition if left untreated. Therefore, it is very important for prompt diagnosis and appropriate management at the earliest[1].

The two common types of liver abscess encountered are amoebic liver abscess and pyogenic liver abscess.

Amoebiasis is a common infestation in developing countries due to poor sanitary facilities. It affects about 10% of the population all over the world. Amoebic liver abscess is the commonest extra intestinal manifestation of amoebiasis. It affects about 3-9 % of victims. India is an endemic zone for amoebic liver abscess. It may present as acute abdomen requiring emergency laparotomy. Spontaneous intraperitoneal rupture, extra and retroperitoneal rupture and intrathoracic rupture are frequently seen in liver abscess. Delay in diagnosis may lead to rupture of liver abscess which may increase the morbidity as well as mortality[2].

Pyogenic liver abscess is not an uncommon entity. It is a relatively rare complication of intra-abdominal infection or biliary tract infection. It is usually polymicrobial in nature due to the ascending route of infection from the gastrointestinal tract[3].

The overlapping of symptoms between amoebic and pyogenic liver abscess makes early clinical differentiation difficult.

In this study we determine the frequency of various clinical featuresof liver abscess and the evaluate the outcome of patients treated by various modalities in terms of hospital stay, cost and its complication of various treatment modalities like conservative management.percutaneous aspiration, percutaneous catheter drainage and laparotomy for ruptured liver abscess.

Material And Methods:-

This single-center prospective and comparitive study of 85 patients was conducted in the Department of Surgery, M.L.B. Medical College, Jhansi, Uttar Pradesh during the course of on 18 Months from January 2020 to June 2021.On 85 Patient who were admitted in the OPD or in the emergency with the clinical features of liver abscesswith the following inclusion criteria.

Inclusion criteria:

1. Male and female 15-80 years.
2. Aspirable and non aspirable liver abscess.
3. Solitary or multiple liver abscess.

Exclusion criteria:

1. Traumatic liver abscess.
2. Past history of liver abscess
3. According to above selection criteria, patients are selectedInthis study after taking a informed consent, approved by ethical committee of this institution and ultrasound wasdone for all the patients. The location, size and site of abscess cavity were identified. Patient included in this study was divided in 4 groups on the basis of cavity size and volume and assigned to different treatment modalities
4. **Group A (Antibiotic Coverage only):** 10 Patients who had abscess cavity <5cm
5. **Group B (Percutaneous aspiration+ Antibiotic Coverage)):** 21 Patients who had cavity size >5cm and volume <100cc
6. **Group C (Laparotomy):** 15 Patients of ruptured and complicated liver abscess
7. **Group D (Pigtail catheter + Antibiotic coverage): 39** Patients who had cavity size >5cm with volume >100cc

There group were compared on the basis of following aspects-

1. Time taker in 50% reduction of cavity size. [Group A, B, D are compared]
2. Time taken for complete reduction of cavity [Group A, B, D are compared]
3. Duration of hospital stay. [Group A, B, C, D are compared]
4. Success rate. [Group A, B, C, D are compared]

5. Rate of complication [Group A, B, C, D are compared]
6. Cost [Group A, B, C, D are compared]

Statistical analysis:
Descriptive statistical analysis was carried out in this study. Result on continuous measurements was presented on mean±standard deviation (Minimum/Maximum) and results on categorical measurements was presented in percentages. ANOVA test was computed the significant features. The statistical software namely, SPSS version 20.0, was used for the analyses of the data and Microsoft Word and Microsoft Excel Version 2013 be used to generate graphs, table etc.

Diagnosis Of Liver Abscess
The diagnosis of amoebic liver abscess is made in the patients who were presented with
Clinical symptoms such as fever and right hypochondrial pain, Enlarged and/or tender liver, with or without jaundice, right lower intercostal tenderness, Marked leucocytosis and deranged liver function test.

Raised right dome of diaphragm on chest x-ray Space occupying lesion in the liver identified by ultrasound / CT scan or other imaging modality suggestive of a hepatic abscess. Liver aspirate like anchovy sauce and bacteriologically sterile. Positive Indirect Haemagglutination of serum antibodies showing a titre of > 1:128 against Entamoeba histolytica. Improvement after treatment with anti amoebic drugs.

Treatment Modalities-
In our study our groups of treatment modalities are taken and comparison is made between them. All the patients satisfying inclusion criteria were carefully worked up in terms of detailed history and clinical examination. Biochemical and imaging studies include complete hemogram, liver function test, prothrombin time, international normalisedratio ,pus culture. Imaging like CXR, abdominal USG with or without CT done. On the basis of USG findings and after taking valid cosent from the patient, they were assigned to following treatment modalities according to the above selection criteria

1. Drug therapy alone
2. Ultrasound guided percutaneous aspiration with drug therapy
3. Laparotomyfor ruptured liver abscess
4. Percutaneous catheter drainage with drug therapys

Group A (Chemotherapy only)
As per our protocol Metronidazole wasgiven in the treatment of uncomplicated liver abscess. The recommended oral dose is 40 mg/kg/day in 3 divided doses for 10 - 15 days in adults and 30 -50 mg per kg per day for 10 days three times a day in children. The intravenous dose is 750 mg 8th hourly for adults and 7.5 mg/ kg 6th hourly in children for 10 days.

Other nitroimidazoles like tinidazole, secnidazole and ornidazole are useful as tissue amoebicides. The common side effect of these nitroimidazoles is metallic taste. Other alternative drugs for eradicating liver trophozoites are chloroquine at a dose of 600 mg per day for 2 days and then 200 mg per day for 2 - 3 weeks. The side effects include diarrhea, abdominal cramps and hypotension.

Result:-

Table 1:- Type of liver Abscess.

Type	Number of cases	Percentage
Pyogenic	17	20%
Amoebic	68	80%
Total	85	100%

Table 2:- Age distribution.

Age in years	Number of patients (n=85)	
	n	%
<30	28	32.94%

31-40	18	21.18%
41-50	23	27.06%
51-60	15	17.65%
>60	1	1.18%
Mean age	41.3±12.354	

Table 3:- Sex distribution.

Sex distribution	**Number of patients (n=85)**	
	N	**%**
Male	72	84.71%
Female	13	15.29%
M:F ratio	5.5:1	

Table 4:- Distribution according to socioeconomic class.

Socioeconomic class	**Number of cases**	**Percentage**
Class V (Lower class)	48	56.47%
Class IV (Upper-Lower class)	26	30.58%
Class III (Lower-Middle class)	11	12.94%
Class II (Upper-Middle class)	0	0.00%
Class I (Upper)	0	0.00%

Table 5:- Symptoms.

Symptoms	**Number of patients (n=85)**	
	Number of cases	**Percentage**
Pain in abdomen	85	100.00%
Fever	63	74.12%
Jaundice	31	36.47%
Right upper quadrant tenderness	67	78.82%
Vomiting	13	15.29%
Loss of appetite	0	0.00%
Anorexia	38	44.71%
Weight loss	5	5.88%
Cough	17	20.00%
Dyspnea	11	12.94%
Bowel habit change	13	15.29%

Table 6:- USG findings.

USG findings		**Number of patients (n=85)**	
		N	**Percentage**
Right lobe abscess	Ruptured	9	10.59%
	Solitary	31	36.47%
	Multiple	25	29.41%
	Total	65	76.47%
Left lobe abscess	Ruptured	5	5.88%
	Solitary	5	5.88%
	Multiple	4	4.71%
	Total	14	16.47%
B/L lobe abscess	Ruptured	1	1.18%
	Solitary	0	0.00%
	Multiple	5	5.88%
	Total	6	7.06%

Table 7:- Pus culture analysis.

Pus culture report	Number of patients	Parentage
Enterobacter	4	0.0%
Klebsiella	11	4.7%
E.Coli	4	12.94%
Staph aureus	0	4.7%
Acinetobacter	1	0.0%
Streptoccoccus	1	1.1%
Proteus	5	1.1%
Polymicrobial	59	5.88%
No growth	59	69.4%

Table 8:- Time taken for 50% reduction.

Parameters	Treatment groups								P value
	Antibiotic Coverage only		Percutaneous aspiration+ Antibiotic Coverage)		Pigtail cathether + Antibiotic		Laparotomy		
	No. of patients	Value	No. of patients	Value	No. of patients	Value	No. of patients	Value	
Time needed for 50% reduction	10	54.7± 7.165 days	21	31.90± 4.624 days	39	22.41± 8.054 days	15	-	
Time needed for total reduction	10	17.4± 3.596 days	21	12.33± 2.265 days	39	7.487± 2.480 days	15	-	
Hospital stay	10	20.1±3.69 5 days	21	15.33±2.1 3 days	39	9.74±2.6 3 days	15	20.2±3.8 2 days	
Successfully treated patients	10	4	21	13	39	38	15	8	
Success rate	10	40%	21	61.90%	39	97.4%	15	53.33%	
Complications	10	6 (60%)	21	8 (38.09%)	39	4 (10.25%)	15	7 (46.67%)	

Discussion:-

In our study 85 cases of liver abscess were randomly selected for the study from December 2019 to July 2021 in MLB Medical College, Jhansi (Bundelkhand region) U.P. India.

1. To study the clinical spectrum & mode of presentation of liver abscess & its distribution with respect to age, sex & socio-economic status.
2. To evaluate the outcome of patient treated with various modalities in terms of hospital stay, success rate, complications & cost.

Age distribution:

In our study most of the young individuals of Bundelkand region are affected with amoebic liver abscess, most cases are in between the age group of 30 years to 50 years with mean age of 38.16 years. Range of (16 - 65 years)

Instead the older individuals more than 50 years of age group with mean age of 45.8 with range of (18- 60 years) years are commonly affected by pyogenic liver abscess mainly due to biliary tract Disease & poor immunity. In earlier days it was due to appendicitis leads to portal pyemia and liver abscess.

In comparing with other studies like***Rajak CL et al***[4] showed average age, 35 years with age range, 2-72 years; ***Sharma N et al***[5]showed mean age of40.5 ± 2.1 years (range = 13-82 years).***Preetikathel et al***[6]showed Age range

of 17-70 years with mean age was 36.5years. The highest incidence was noted in the age group of 26- 35 years (37.0%). Regarding age distribution of the liver abscess, our study correlate with above studies.

Sex ratio:
Due to alcohol intake by males comparing to females, alcohol induced liver damage is more in male population leading to high incidence of amoebic live abscess in males of bundelkhand area.

In our study M:F ratio for amoebic liver abscess is 8.7:1 and for pyogenic abscess ratio is 1.8:1 which is more or less equal. It correlates with other studies like ***PreetiKathal et al[6], S. Singh et al[22]*** (M:F 5.9:1)***, Sharma N et al[5]*** (M:Fwas 7:1).

Socio-Economic Distribution
In our study division of socio economic classes done according to kuppuswamy scale and majority of patient belongs to class 5 (lower class) 58.7 % and class 4 (upper lower class) 30.5%. which also correlates with other studies like ***Amitesh Kumar Jha et al[5]***where 81.2% of patients belongs to lower class & 13.6% of patient were from middle socio economic status**.**

Liver abscess is a infectious disease which is transmitted through feco-oral route so poor hygiene, sanitation practices &over crowding results in higher incidence of disease in lower socio-economic status.

Clinical Features-
The pain in the right hypochondrial region is due to stretching of the liver capsule by the abscess cavity. If the abscess is large enough to stretch the capsule may cause pain. In our study most common symptom was abdominal pain (100%) present in all the cases of amoebic and pyogenic liver abscess. In our study most of the patients had Right Hypochondriac pain; some shows Epigastrium and generalized abdominal pain. Fever was also significant symptom slightly more in pyogenic liver abscess (76%) as (73%) in amoebic liver abscess.

Signs like right upper quadrant tenderness was present almost equally in both amoebic 79.6% & pyogenic 76.7% liver abscess. Jaundice was also present more in pyogenic (41%) than amoebic (35%) liver abscess, because the biliary tract disease is the most common etiology in pyogenic abscess. This may be due to compression of the common bile duct by multiple abscess or large abscess.

As compared to other studies like **Ochsner A et al[7], PreetiKathel[6], Amitesh Kumar Jha et al[8],** All of these studies has abdominal pain as most common symptom and right upper quadrant tenderness as most common sign the results of our study are consistent with above studies.

Investigations:
All the cases of liver abscess who were admitted in our hospital had blood examination for haemoglobin, total and differential leucocyte count, blood sugar,Liver function test, Prothrombin Time (PT), International Normalised ratio (INR). Anemia was seen in half of the patients in the study group. The leukocytosis was observed in three fourth of the patients in both groups. Liver function tests are found deranged, bilirubin is found raised in about half of patients, All patient had increased Aspartate amino transferase (AST)/ Alanine amino transferase (ALT) ratio, increased Alkaline phosphatase (ALP) and decreased albumin level.

Chest X-ray PA view was taken to all the patients, which shows increase in dome of right diaphragm. Ultrasound abdomen was done to all the patients to know the size, number, location of the abscess cavity and rupture of the abscess and intra abdominal pathology. CT Scan was not required for any of our patients included in the study.

Ultrasound findings:
Most of the liver abscess occur in right hemiliver which is due to preferential laminar blood flow to the right side, this results in increased blood flow to right side and increased infection in right side.

In our study for all the cases ultrasonogram was done where as in 65 out of 85 cases, abscess occurred in right lobe (76.4%), 14 in left lobe (16.4%) and in 6 cases abscess occurred in both lobes (7.05%). majority of right lobe abscess are solitary & left lobe abscess are multiple while 17% cases were ruptured .

Most of the study says that the right lobe is commonly involved which is consistent with studies like ***Alpesh N. Amin et al[9],Rajak et al[10], PreetiKathal et al[6]***to which our study also correlates.

PUS culture analysis:
In our study E.coli (**12.94%**) were most common organisms isolated as compared to the study of ***Hyo Min Yoo et al[11]*** in which only E.coli accounted for 63.0%. 5.8% cases has shown polymicrobial growth. Klebsiella was found common in culture findings in ***Khee-Siang Chan et al[12]*** (82.3%) , ***Hyo Min Yoo et al[11]*** (28.0%) and it was **4.7%** in our study. This study showed 69.4% of cases as no growth, out of this only 3 cases were ofpyogenic type and 56 were from amoebic type. So they might be cases of amoebic abscess with no secondary bacterial infection or pyogenic abscesses that had been taken empirical antibiotic treatment which rendered the pus sterile or low bacterial load in pus to show growth in culture.

Treatment outcome:
Our study was done to evaluate the outcome of patient treated with various modalities used in management of liver abscess, in terms of hospital stay, success rate, complications & cost. The patients included in the study was divided in to 4 groups.

Group 1 comprises of 10 patients (11.7%) who had abscess cavity <5cm, they are managed conservatively with antibiotic only, success rate of this group in our study was (40%), mean hospital stay was 20 days and 6 out of 10 patients were subjected to percutaneous procedures due to complications like increase in cavity size or abscess not resolving after 96 hours of hospital admission.

The results our study are consistent with previous studies like ***Santosh Kumar Singh et al[13]***showed 36% success rate in conservatively managed group. ***Alpesh B. Amin et al[9]*** showed 14 out of 51 patient were managed successfully by antibiotic alone. ***JoergeBlessmann et al[14]*** did a comparative study on metronidazole alone vs in combination with USG guided aspiration in which resolution pattern for various laboratory and clinical parameter revealed no difference except for liver tenderness which disappeared faster in aspiration group during first 3 days which was also seen in our study.

Group 2 comprises of 21 patients (24%) who had cavity size > 5cm and vol< 100cc had undergone percutaneous aspiration with antibiotic coverage , in our study success rate of this group was 61.9%, mean hospital stay was 15 days 8 out of 21 patients were subjected to pig tail catheterization due to failure to treat by aspiration.

Success rate in study conducted by ***Rajak CL et al[10], Santosh Kumar Singh et al[13]***was 60% and 62% respectively which is consistent with our study while success rate in other reported studies varies from 79 to 100% ***Giorgio et al, Dietrick et al[15]***. The reason this high success rate was 3-4 times repeated aspirations but in this study reaspiration done only once in case of no response to first aspiration.

Group 3 comprises of 15 patient (17.65%) who presented with severe abdominal pain and other signs of peritonitis and shock were admitted in emergency and had ruptured abscess cavity in their ultrasound findings they were treated surgically by laparotomy. This group had high rate of severe complications like sepsis 2 patients (13%) wound infection Surgical Site Infection 4 patients (27%), 1 patient died due to septic shock. Success rate of this group was 53.3%, mean hospital stay was 20 days.

Group 4 comprises of 39 patients (45.8%) who had cavity size > 5 cm and volume > 100cc had undergone most preferred way of treatment; percutaneous pig tail catheterisation with antibiotic coverage. In contrast to percutaneous needle aspiration percutaneous placement of an indwelling pig tail catheter provides a continuous drainage. Hence re accumulation and incomplete drainage are not associated with catheter drainage that is why it is a better way of management. In our study success rate of this group was highest (97.4%) while mean hospital stay was shortest 9 days which is statistically significant, haemorrhage occurred in 1 patient while inserting catheter which was managed by laparotomy. Haemorrhage occurred in 1 patient while inserting catheter which was managed by laparotomy.

In our study success rate was 97% which is comparable to other previous studies like ***Alpesh B. Amin et al[9], Rajak CL et al[10], Amtesh Kumar Jha et al[8]*** in which success rate was found 100% but the difference is insignificant.

Catheter drainage was found best modality of treatment of liver abscess in our study which is consistent with previous reports.

50% and total cavity reduction time:
Mean time for more than 50% reduction of cavity size & total time taken for complete reduction of cavity was compared for group 1 (antibiotic coverage only) gruop 2 (percutaneous aspiration with antibiotic coverage) and group 4 (percutaneous pig tail catheterisation with antibiotic coverage) because cavity was found rupture in group 3 patients who had undergone to laparotomy.

In this study, mean time for more than 50% reduction of cavity size of group 1 patient was 17.4 days with range of (10-23 days).Mean time of group 2 patients was 12.3 days with range of (9-18 days).it is lowest in group 4 patients which is 7.4 days with range of (4-12 days).

On comparing mean time taken for complete reduction of cavity it was found lowest 22.4 days with range of (9-35 days) in group 4 (percutaneous pig tail catheterisation with antibiotic coverage) patients. Highest in group 1 patients 54.7 days range (44-63 days). In group 2 it is 31.9 days range (20-42 days) which is more than group 4 & less than group 1.

When compared to other studies like ***Rajak CL et al***[10]mean time needed for a 50% reduction in the size of the abscess cavity was greater in the aspiration group than in the catheter group 11 days versus 5 days, the mean time taken for total resolution of abscess was the same (15 weeks) in both groups. In study of ***Santosh Kumar Singh et al***[13] mean time for 50% reduction in the size of the abscess cavity was highest in the conservative group 16 days and lowest in catheter group 6.94 days which is also less than aspiration group 9.4 days. Similarly time needed for complete reduction of cavity is also found lowest in catheter drainage group 9.88 week. Results of this study also correlates with above studies.

Complications-
Infection:
Infective complications were divide into surgical site infection and drain site infection.Surgical Site Infection rate is higher in group 3 patients 4 out of 15 (26.6%). Because the open surgical techniques are more prone for infection than any other procedures.Infection may be due to non sterile techniques and contamination of the surgical wound by the pus.

In closed tube percutaneous catheter drainage method drain site is more prone to get infected in cases of long duration of catheter placement and peritoneal spillage of the pus may occur. In this method also infection rate is relatively higher in comparing group 1 and group 2 which is 3 out of 39 patients (9.6%). Due to the infection the duration of the hospital stay, use of antibiotics are increased.

Lambiase et al[16]reported 12% complication rate in series of catheter drainage. ***Baek et al***[17] reported 4% complication rate in series of percutaneous needle aspiration.

Haemorrhage:
This complication is higher in case of percutaneous ultrasound guided aspiration and catheter drainage methods due to lack of direct visualisation during the procedures. In open drainage methods direct visualisation is possible. However in our study hemorrhage occurred in 1 out of 39 patient of percutaneous catheter drainage (2.5%).

No major complication was also detected in previous studies like ***Rajak et al***[10] suggested that these procedures are relative safe in experienced hands with minimal complications.

Increase in cavity size & Non resolution of cavity:
These complications were higher in group 1 antibiotic coverage only (60%) and in group 2 percutaneous needle aspiration with antibiotic coverage (38%) due to failure of given treatment. After occurring of complication these patients were subjected to pigtail catheterisation.

Major reason for failure of needle aspiration was inability to evacuate thick pus by wide bore needle which may present in some cases. The results of our study are consistent with studies like ***Santosh Kumar Singh et***

al*[13]*&Amitesh Kumar Jha et al*[20]*, Rajak et al*[17]**Some studies have low rates of these complications (0 to 21%) like ***Baek et al*[17]*and Giorgio et al*[15]*. Reason for this type of result is increase in number of times of aspiration 3-4 in these studies but in our study reaspiration done only once in case of no response to first aspiration.

Sepsis:
In our study this type of complication occurred in patient who had ruptured liver abscess and presented with features of shock & peritonitis in emergency i.e. sepsis occurred in 2 out of 15 patient of group 3 (13.3%).

Rupture of abscess cavity causes spillage of pus in peritoneal cavity which causes development of peritonitis. Translocation of these micro organisms into blood stream ensue sepsis and patients land up in septic shock which ultimately causes death of patient in absence of proper surgical intervention.

Mortality
Before the use of antibiotics and drainage procedures, liver abscess was uniformly fetal. It was first proved by ***Ochsner and Debakey et al*[7]**(1938) that routine surgical drainage was used and dramatic reduction in mortality were noted.

After development of high quality imaging and expertise in interventional radiological and minimally invasive techniques for treatment of liver abscess causes further reduction in mortality rates.

In our study 1 out of 85 patients of liver abscess died unfortunately due to septic shock (1.1%) after surgical drainage; which was found consistent with most of modern studies like ***Robert F. dodelinger et al*[18]** in which mortality rates was 6%.

COST:
This study was conducted in government medical college, Jhansi where all the procedures are done free of cost and all the expenses of research is being beared by government. A rough estimate has been made while comparing the cost of antibiotics and procedure in the other hospitals it was found that mean expenditure of group 1 patients who are managed conservatively was Rs 3530, mean expenditure of group 2 patients who were treated with percutaneous aspiration with antibiotic coverage is Rs 3233, while mean expenditure of group 3 patient is highest because they had undergone through open surgical procedure i.e. laparotomy which has many serious complications resulting in increase in hospital stay and increase in cost. The most cost effective and less expensive procedure is pig tail catheterisation with antibiotic coverage group 4 with mean expenditure of Rs 2100. the reason being shorter hospital stay, early resolution of cavity and low rate of complication.

Conclusion:-

1. In our study 85 cases are selected in which majority of cases were of amoebic liver abscess in comparison to pyogenic abscess and most of them belonging to lower socio economic status.
2. Amoebic liver abscess was presented in early age while late age presentation is seen in pyogenic liver abscess. Males were affected predominantly more in both types of liver abscess. Right lobe of the liver was frequently involved compared to left lobe in both amoebic and pyogenic liver abscess.
3. In our study most common modes of presentation were abdominal pain and fever especially in pyogenic liver abscess. Most common clinical signs were Jaundice and right upper quadrant tenderness which was more commonly seen in amoebic liver abscess.
4. Among various interventions, percutaneous pig tail catheter with antibiotic coverage was found most successful modality of treatment in terms of early clinical and radiological improvements, less hospital stay, less time for reduction of size of cavity, low cost and with least complication rates.
5. To conclude interventional treatment was found superior to conservative management. Among surgical interventions percutaneous pig tail insertion with antibiotic coverage is the best way to treat liver abscess. In case of ruptured liver abscess open surgical method is ideal.

References:-

1. GeethaDanasekaran 1 ; SurendranSankarapandian 2 ; ManivannanPalani 3 ;.A prospective study on incidence, aetiopathogenesis, clinical presentation, management and prognosis of liver abscess.Journal of Evidence Based Medicine and Healthcare, Volume 4, Number 39, 2017, pp. 2367-2370(4).
2. Memon AS, Siddiqui FG, Memon HA, Ali SA. Management of ruptured amoebic liver abscess: 22-years experience. J Ayub Med Coll Abbottabad. 2010 Apr-Jun;22(2):96-9.
3. Wang JH, Liu YC, Lee SS, Yen MY, Chen YS, Wang JH, Wann SR, Lin HH. Primary liver abscess due to Klebsiella pneumoniae in Taiwan. Clin Infect Dis. 1998 Jun;26(6):1434-8.
4. APA. Gray, H. (2013). Grays Anatomy. Arcturus Publishing. Chicago. Gray, Henry. 2013. Grays Anatomy. London, England: Arcturus Publishing. MLA. Gray, Henry. Grays Anatomy. Arcturus Publishing, 2013.
5. Sharma N, Sharma A, Varma S, Lal A, Singh V. Amoebic liver abscess in the medical emergency of a North Indian hospital. BMC Res Notes. 2010;3:21. Published 2010 Jan 25
6. PreetiKathel1 , Madan Mohan Mudgal2 , Naveen Kushwah3.Comparison of Various Techniques Used in The Management of Liver Abscess.Sch. J. App. Med. Sci., 2015; 3(3G):1529-1533
7. Ochsner A, DeBakey M, Murray S. Pyogenic abscess of the liver. Am J Surg 1938;40:292–314
8. Jha AK, Das A, Chowdhury F, Biswas MR, Prasad SK, Chattopadhyay S. Clinicopathological study and management of liver abscess in a tertiary care center. J Nat SciBiol Med. 2015 Jan-Jun;6(1):71-5
9. Alpesh B. Amin, Rajesh D. Patel, Chirag Doshi, Amit V Bhuva. A comparative study of different modalities of treatment of liver abscess. IAIM, 2015; 2(4): 11-16
10. Rajak CL, Gupta S, Jain S, Chawla Y, Gulati M, Suri S. Percutaneous treatment of liver abscesses: needle aspiration versus catheter drainage. AJR Am J Roentgenol. 1998 Apr;170(4):1035-9
11. Yoo HM, Kim WH, Shin SK, et al. The changing patterns of liver abscess during the past 20 years - a study of 482 cases. Yonsei Medical Journal 1993;34(4):340-51.
12. Chan KS, Chen C, Cheng K, Hou C, Lin H, Yu W; Pyogenic liver abscess: a retrospective study of 107 patients during a 3 year period. Jpn J Infect dis, 2005; 58(2): 366-368.
13. Dr. Santosh Kumar Singh, Dr. Anish Kola, Dr.SoumitraManwatkar and Dr.AnkurTripathi.Comparative study of various modalities of treatment in uncomplicated amoebic liver abscess.International Journal of Surgery Science 2019; 3(1): 123-127.
14. Blessmann J, Binh HD, Hung DM, Tannich E, Burchard G. Treatment of amoebic liver abscess with metronidazole alone or in combination with ultrasound-guided needle aspiration: a comparative, prospective and randomized study. Trop Med Int Health. 2003 Nov;8(11):1030-4.
15. Giorgio A, Tarantino L, Mariniello N et al. Pyogenic liver abscess: 13 years of experience in percutaneous needle aspiration with US guidance. Radiology. 1995; 195:122- 124.
16. Lambiase RE. Percutaneous abscess and fluid drainage: a critical review. CardiovascInterventRadiol. 1991; 14(3):143-57
17. Baek SY, Lee KS, Lee SC, Sung KB, Auh YH. Therepeutic percutaneous aspiration of hepatic abscesses: effectiveness in 25 patients. AJR. 1993; 160:799-802.
18. Dondelinger RF, Kurdziel JC, Gathy C. Percutaneous treatment of pyogenic liver abscess: a critical analysis of results. CardiovascInterventRadiol. 1990 Jun-Jul;13(3):174-82.