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PATTERNS AND DIFFERENCES IN CHARACTERISTICS OF TYPES OF LIVER ABSCESS CASES IN CIVIL HOSPITAL, KARACHI

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ABSTRACT:

***Objectives*:** The main objective of this study was to compare the disease characteristics, sign & symptoms, radiological and lab findings in two type's i-e Pyogenic and Amebic abscess. Further to identify important predictors of these two types.
Study Design: Descriptive Study.
Place and Duration of Study: Department of Medicine Civil Hospital Karachi from Jan 2007 to March 2010.
Subjects and Methods: Medical records of all patients admitted in Civil Hospital Karachi (CHK) with a diagnosis of liver abscess were identified by using the International classification of diseases 9th revision with clinical modification (ICD-9-CM-USA) and reviewed retrospectively. Diagnosis of liver abscess was based upon clinical history and abdominal ultrasound or CT scan findings. Out of all cases of liver abscess only 210 confirmed cases were enrolled in this study. The data including demographic information, chief complaints duration of fever or abdominal pain, associated illnesses, malignancy and history of biliary surgery or other procedures along with laboratory investigations were collected through specially designed Performa. Results will be fed to SPSS 15.0 for statistical analysis where test of statistical significance were applied accordingly.
Results: Out of total of 210 reported cases, 158 (75.2%) were amebic cases while the remaining 52 cases (24.8%) were pyogenic. Amebic cases reported significantly more with classical symptoms of fever with chills, abdominal pain and vomiting while higher percentage of cases reported symptoms of generalized weakness and cough in pyogenic liver abscess (p-value=0.0000). 21.2% of cases had history of diabetes mellitus. Rupture of abscess was observed in only 1 case. E.coli was the predominant pathogen (50% of cases) on culture report followed by Klebsialla pneumonia (35.4%) while remaining of the cases were polymicribial (14.6%).
Conclusion: The occurrence of classical symptoms and signs of fever with chills, abdominal pain, vomiting, right hypochondriac pain and hepatomegaly are more likely to occur in amebic abscess while presence of multiple abscesses, gas formation and diabetes mellitus are strong predictors of Pyogenic abscess.

Key Words: Patterns, Types, Liver abcess

INTRODUCTION:

Liver abscess is defined as an inflammatory space occupying lesion as localized collection of pus within liver parenchyma. Liver is more prone to insult as it receives blood both from systemic and portal circulation. With the new advents in treatment and diagnostic technologies, liver abscess although infrequent but still stand as a major clinical problem with unchanged incidence and prevalence[1, 2]. It can lead to life threatening condition with severe complications[2]. Use of more potent antibiotics, newer microbiological identification techniques, supportive care and drainage via interventional radiology with use of ultrasound and CT scan or open surgery has improved the outcome and survival chances but mortality with liver abscesses still has highest incidences in patients with positive blood cultures,

significant anemia, elevated bilirubin levels, multiple abscesses and being Cauc0asian[3, 4].

With emphasis on different types of liver abscess, Pyogenic is far more common in west and accounts for 80% of total burden, whereas, amoebic liver abscess predominantly occurs in the developing countries[5].

Conditions related to biliary tract (calculus, strictures and malignancy), systemic or portal circulation (hematogenous spread), appendicitis, diverticulitis or inflammatory bowel disease may lead to pyogenic liver abscess. Amoebic liver abscess arises mostly as a complication of intestinal amoebiasis caused by Entamoeba histolytica[8]. Globally amoebiasis contributes third most mortality burden among parasitic infestations after malaria and schistosomiasis[6] and is the etiological cause of amoebic liver abscess in 3% to 9% of cases[7]. With more burdens in tropical and subtropical countries, amoebic liver abscess is more frequent in Pakistan and India as a result of poor personal and environmental hygiene, overcrowding and contaminated water supply[8]. Although very limited statistics are available with reference to Pakistan, it clearly shows amoebic liver abscess as a predominant entity.

With this study we intend to describe the patterns observed in large number of liver abscess cases. The main objective of this study was to compare the disease characteristics, sign & symptoms, radiological and lab findings in two types (Pyogenic and Amebic) and identify important predictors of these two types.

SUBJECTS AND METHODS:

Medical records of all patients admitted to CHK (Civil hospital Karachi) with a diagnosis of liver abscess over a 2 year period (Jan 2007 to march 2010) were identified by using the International classification of diseases 9th revision with clinical modification (ICD-9-CM-USA) and reviewed retrospectively. Diagnosis of liver abscess was based upon clinical history and abdominal ultrasound or CT scan findings. Out of all cases of liver abscess only 210 confirmed cases were enrolled in study. The data including demographic information, chief complaint, duration of fever or abdominal pain, associated illnesses, malignancy and history of biliary surgery or other procedures were collected through specially designed Performa. Results of laboratory investigations and imaging studies done at the time of admission were recorded as were the clinical course of disease, modalities of treatments used and outcome of the patients.

Patients with liver abscess were undergone to the following investigations: Complete blood counts, imaging by ultrasound, Indirect Hem-agglutination Assay (IHA) for amebiasis, blood culture and pus culture if the abscess was aspirated. IHA was done with serology reagent “Cellognost Amebiasis”) and a titer of ? 1:128 was taken as diagnostic for amebic liver abscess, as per the manufacturer’s recommendations. Based upon the results of these investigations, patients with liver abscess were categorized into four groups according to the following criteria: (1) Amebic liver abscess (ALA): IHA titer ? 1:128 with negative blood or pus culture. (2) Pyogenic liver abscess (PLA): IHA titer < 1:32 with or without positive blood and/or pus culture. (3) Mixed liver abscess (MLA): IHA titer ? 1:128 with positive blood and/or pus culture.

STATISTICAL ANALYSIS:

A descriptive analysis was done for demographic, clinical and radiographic features and results were presented as mean ± SD for quantitative variables and number (percentage) for qualitative variables. In univariate analyses, differences in proportions for the group of patient (Pyogenic abscess and Amebic Abscess) were done by using the Chi-square test or Fisher exact test where ever appropriate.

RESULTS:

Figure 1 shows the distribution of pyogenic and amebic liver abscess cases. Out of total of 210 reported cases, 158 (75.2%) were amebic cases while the remaining 52 cases (54.8%) were pyogenic.

Table 1 shows Differences in demographic characteristics and presentation of Amebic and Pyogenic Liver abscess cases. Almost half of the cases belonged to old age group of 50 years and above. Higher percentage of males (p-value=0.006) was observed in amebic cases (86%) as compared to pyogenic abscess (69.2%). Amebic cases reported significantly more with classical symptoms of fever with chills, abdominal pain and vomiting while higher percentage of cases reported symptoms of generalized weakness and cough in pyogenic liver abscess (p-value=0.0000). While there was no significant difference in signs of jaundice and epigastric tenderness, anemic cases presented significantly higher with hepatomegaly as compared to pyogenic liver abscess. No difference was observed in the length of stay in the hospital in both types. All the cases were successfully cured except for one case of ruptured pyogenic abscess that expired.

Table 2 describes differences in findings of Ultrasound and Chest X-ray in Amebic and Pyogenic Liver abscess cases. No significant difference was observed chest X ray findings and abscess size on Ultrasound abdomen. Pyogenic cases were more likely to have multiple abscesses (71%) as compared to amebic cases (20.9 %).

Table 3 describes a few more characteristics of pyogenic liver abscess cases. 21.2% of cases had history of diabetes mellitus. Rupture of abscess was obsereved in only 1 case. Minor proportions of biliary obstruction and cholangitis were reported in CT Scan results while Gas formation was reported in 32.7% cases in X-ray KUB. E.coli was the predominant pathogen (50% of cases) on culture report followed by Klebsialla pneumonia (35.4%) while remaining were polymicribial (14.6%).

DISCUSSION:

This study reveals that around one fourth of the cases of liver abscess are of pyogenic origin. This ratio is consistent with previous

FIG: 1:

The distribution of pyogenic and amebic liver abscess cases. n=210

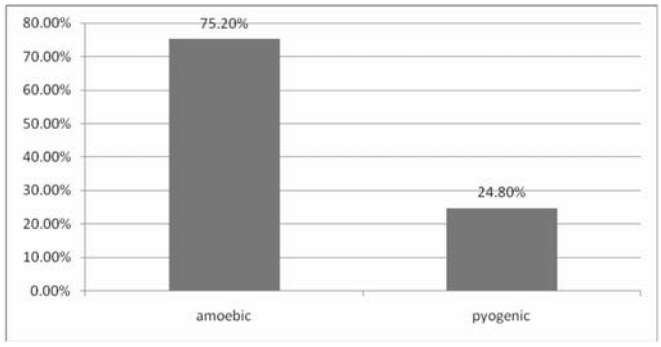


TABLE 1:

Differences in demographic characteristics and presentation of Amebic and Pyogenic Liver abscess cases. Chi square test applied to see the statistical differences:

	Amebic Abscess (n=158)	**Pyogenic Abscess (n=52)**	**P-value**
Age			
12-29	32 (20.2%)	7 (13.4%)	
30-49	60 (37.9%)	18 (34.6)	0.368
50 and above	66 (41.9%)	27 (52%)	
Sex			
Male	136 (86%)	36 (69.2%)	0.006
Female	22 (14%)	16 (30.8%)	
SYMPTOMS			
Fever with chills			
Yes	155 (98.1%)	43 (82.7%)	0.000
No	003 (1.9%)	09 (17.3%)	
Abdominal pain			
Yes	146 (92.4%)	34 (65.4%)	0.000
No	012 (7.6%)	18 (34.6%)	
Vomiting			
Yes	75 (47.5%)	09 (17.3%)	0.000
No	83 (52.5%)	43 (82.7%)	
Generalized weakness			
Yes	006 (3.8%)	14 (26.9%)	0.000
No	152 (96.2%)	38 (73.1%)	
Cough			
Yes	0 (0%)	03 (5.8%)	
No	158 (100%)	49 (94.2)	0.015
SIGNS			
RHC Tenderness			
Yes	158 (100%)	47 (90.4%)	0.001
No	0 (0%)	05 (9.6%)	
Hepatomegaly			
Yes	113 (71.5%)	20 (38.5%)	0.000
No	045 (28.5%)	32 (61.5%)	
Jaundice			
Yes	17 (10.7%)	2 (3.9%)	0.169
No	141 (89.3%)	50 (96.1%)	
Epigastric tenderness			
Yes	20 (12.6%)	8 (15.3%)	0.616
No	138 (87.4%)	44 (34.7%)	

studies in Pakistan[9, 10]. This can be explained by high prevalence and incidence of amebiasis in developing countries[11]. Only few studies in the past have looked at the differences in the presentation and investigative findings of amebic and pyogenic liver abscesses. Higher prevalence of amebic abscess in males is explanatory of the fact that men have more exposure of developing amebiasis. Moreover, high risk in old age is also consistent with previous studies. The predominance of amebic abscess with classical presentation with symptoms of fever with chills, abdominal pain and sign of hepatomegaly have also been reported in literature previously (abscess (May et al. 1967; Barbour & Juniper 1972; Conter et al. 1986; Barnes et al. 1987). This is suggestive of pyogenic abscess being more atypical and having other symptoms like generalized weakness and respiratory symptoms. Previous work has reported higher frequency of jaundice and abnormal Chest X-ray findings in pyogenic abscess[12] but results of this study suggest no significant difference in these two entities. Findings on ultrasonography also confirm that multiple abscesses are suggestive of pyogenic abscess and right lobe is predominantly affected in amebic abscess. These findings are also similar to the findings of

TABLE 2:

Differences in findings of Ultrasound and Chest X-ray in Amebic and Pyogenic Liver anscess cases:

	Amebic Abscess (n=158)	**Pyogenic Abscess (n=52)**	
Size			
<5	42 (26.5%)	13 (25%)	
5-10	102 (64.5%)	29 (55.7%)	
>10	14 (9%)	10 (19.3%)	0.122
No; of abscess			
Single	125 (79.1%)	15 (29%)	
Multiple	33 (20.9%)	37 (71%)	0.000
Involved lobe			
Right	133 (84%)	37 (71%)	
Left	19 (12%)	7 (14%)	
Both	6 (4%)	8 (15%)	0.012
Radiology			
CXR			
Normal	103(65.2%)	38 (73%)	
Elevated	30 (19%)	11(21.1%)	
diaphragm	25 (15.8%)	3 (5.9%)	0.181
Pleural effusion (Rt)			

TABLE 3:

Characteristics of pyogenic liver abscess cases (n=52)

Diabetes Mellitus	
Yes	11 (21.2%)
No	41 (78.8%)
Abscess rupture	
Yes	1 (1.9%)
No	51 (98.1%)
CT SCAN results	2 (3.8%)
Biliary obstruction	2 (3.8%)
Cholangitis/Biliary obstruction	1 (1.9%)
Fluid in abdomen	47 (90.4%)
Normal	
KUB	
Gas formation	17 (32.7%)
Normal	35 (66.3%)
Culture report (n=48)	
E.coli	24 (50%)
Klebsiella pneumonia	17 (35.4%)
Polymicrobial	7 (14.6%)

previous study[13]. However, size of abscess did not differ in both types of abscesses.

Prevalence of diabetes in pyogenic liver abscess cases has ranged from 10-30% in previous studies[14, 15]. Evidence of DM in 21% cases in this study confirms that DM is an important predictor of Pyogenic Liver Abscess. Almost one third of cases of Pyogenic Liver Abscess reported gas formation on X-ray KUB which is consistent with the international range of 7-24%[16]. E.coli was found to be the most common pathogen in pyogenic liver abscess which is consistent with older studies. However, another study indicated Klebsiella pneumonia to be the predominant pathogen[17]. In this study Klebsiella was found to be the 2nd most common pathogen. Another finding that is consistent with recent literature is that of low fatality, with improved diagnosis and treatment fatality of pyogenic liver abscess has reduced remarkably.

This study has a few limitations. It presents a picture of cases in one setting. Multisite data on liver abscess cases could have added to the external validity of the study. Moreover, data on preferred treatments and response to therapy was not recorded. We recommend that a detaliled multicenter study would be useful to conduct in future.

CONCLUSION:

In local population amebic abscess is more prevalent. The occurrence of classical symptoms and signs of fever with chills, abdominal pain, vomiting, right hypochondriac pain and hepatomegaly are more likely to occur in amebic abscess while presence of multiple abscesses, gas formation and diabetes mellitus are strong predictors of pyogenic abscess.

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