

Pyogenic Liver Abscess: A Five Year Retrospective Study in Slums of Karachi

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ABSTRACT

OBJECTIVE: To analyze the various features of pyogenic liver abscess in poorly developed slum area of Karachi.

DESIGN & SETTINGS: A retrospective study done in hospitalized diagnosed cases of pyogenic liver abscess confirmed by ultrasonography in Jinnah Medical College, Hospital Korangi Karachi from January 2004 to December 2008.

METHODS: All patients diagnosed as pyogenic liver abscess were reviewed for demographic status, clinical features, hematological and biochemical analysis, size of abscess, cultures of pus, management and outcome. Ameobic liver abscesses were excluded. The data were analyzed on SPSS 11.5.

RESULTS: A total of 76 patients was diagnosed as pyogenic liver abscess having 76.6% male and 22.4% female patients with mean age of 52.1 yrs. The most common symptoms and signs were upper abdominal pain in 82.6%, fever in 75%, right hypochondrium tenderness in 43.4%, hepatomegaly in 30% and jaundice in 18.4%. Leucocytosis (71%), raised alkaline phosphatase levels (63%), raised total bilirubin levels (60.5%), ALT levels (52.6%) and low hemoglobin values (42%) patients were common abnormal laboratory findings. Ultrasonography showed that right lobe of the liver was involved in 85.5% patients with 84.2% patients having single abscess. *Klebsiella pneumoniae* 35.7% was revealed as the common pathogen from the aspirated pus of the patients. Only 9 (11.8%) patients were referred for surgical intervention and followed up there. There was no mortality noticed in this study.

CONCLUSION: Patients with Pyogenic liver abscess can be managed with better outcome if diagnosed early with ultrasound, necessary intervention and appropriate therapy.

KEY WORDS: Pyogenic Liver Abscess, Ultrasonography, intervention.

INTRODUCTION

Pyogenic Liver Abscess (PLA) was reported by Hippocrates who based prognosis on the type of fluid recovered from the abscess¹. The incidence of pyogenic liver abscess ranges from 8 to 20 cases per 100,000 hospital admissions, usually affecting the elderly². About seven decades back surgical treatment was the primary treatment modality as described by Ochsner and DeBakey³. Till the mid of 1980's surgery remained the therapy of choice, when percutaneous drainage was shown to be safe alternate in many studies⁴⁻⁵. Ultimately introduction of advance and potent antimicrobial agents and advances in diagnostic imaging and imaging guided percutaneous procedures improved the management of pyogenic liver abscess significantly⁶⁻⁹.

Commonly reported presentations noticed in past were fever, upper abdominal pain, nausea, vomiting, right hypochondrium tenderness, hepatomegaly and jaundice¹⁰⁻¹⁶. Mortality rates have subsequently decreased from 30% to 2.8% over the years as showed

by many studies^{10,11,17-19}, due to early diagnosis and treatment with intervention. Western population showed *E. coli* to be dominant strain in many studies¹⁰ whereas people residing in Eastern territories had *klebsiella pneumoniae* found to be the strain in their abscesses¹⁹⁻²⁰.

METHODS

This retrospective study was conducted to analyze the various features of pyogenic liver abscess in poorly developed urban areas of Karachi. Data of all admitted patients with the diagnosis of suspected pyogenic liver abscess in Jinnah Medical College Hospital, Korangi Karachi, from the period of January 2004 to December 2008 was reviewed. The inclusion criteria were as follows;

Age above 15 yrs.

- Single or multiple hepatic lesions in ultrasound imaging.
- Positive cultures of aspirated pus.
- Response to antibiotics therapy despite negative cultures of aspirated pus.

- Resolving of lesions with antibiotics therapy without any intervention

All patients diagnosed as amoebic liver abscess were excluded. The selected patients were reviewed for their demographic status, clinical features, hematological and biochemistry analysis, size of abscess, cultures of pus and management. The data were analyzed in SPSS 11.5.

RESULTS

In present study 76 patients with diagnosis of pyogenic liver abscess met the inclusion criteria. Males were dominant 59 (76.6%) while females were only 17 (22.4%). The mean age was 52.1 years with a range of 16 years to 86 years.

The commonest symptoms were upper abdominal pain in 63 patients (82.6%), fever in 57 (75%), cough in 17 (22.3%), nausea and vomiting in 13 patients (17.1%). The most common signs were right hypochondrium tenderness in 33 patients (43.4%) and hepatomegaly 23 patients (30%) (Table I).

TABLE I: CLINICAL FEATURES NOTICED IN PLA PATIENTS (n=76)

Signs	No. of Patients	Percentage
Rt.Hypochondrium Tenderness	33	43.4
Hepatomegaly	23	30
Jaundice	14	18.4
Ascities	14	18.4
Shock	7	9.4

On reviewing the hematology and biochemistry high leukocyte count (>10,000) was most common abnormal value in 54 patients (71%), alkaline phosphatase level (>350) in 48 (63%), total bilirubin (>2.5) in 46 (60.5%), ALT levels (>100 IU/L) in 40 (52.6%), and

TABLE II: LABORATORY FINDINGS IN PLA PATIENTS (n=76)

Test	Mean	Minimum	Maximum	Std. Deviation	Abnormal values (%)
Hemoglobin (gm/dl)	11.2	6.8	19.5	2.1	42
Leucocyte count	12400	4000	27600	4408.9	71
ESR	67.3	10	155	29.4	
Billirubin total	3.5	1	5.3	1.18	60.5
ALT (IU/L)	159.3	23	451	117.34	52.6
Alkaline Phosphatase	428	243	653	110.5	63

hemoglobin (<12gm/dl) in 32 (42%) patients (Table II). Only 17 patients (22.9%) showed abnormal chest x-rays out of which right sided pleural effusion was in 9 (52.9%), right lower zone infiltrate were in 5 (29.4%), and right sided pleural effusion with infiltrates were in 3 patients (17.6%).

Ultrasonography was done in all patients which showed that right lobe of liver was involved in 65 (85.5%) and left lobe in 11 (14.5%) patients. Single abscess was noticed in 64 (84.2%) of patients while 12 patients (15.8%) had multiple abscesses. The average size of abscess was 6.5 cm with a range of 4.1cm to 11.5cm. All patients presenting with abscesses size >8 cm (n=25) and multiple abscesses (n=12) were drained while other were only treated with antibiotics. Treatment options are described in Figure I.

The aspirated pus from 28 patients revealed Klebsiella pneumonia as the most common pathogen in 10 (35.7%) patients followed by Escherichia coli and Pseudomonas aeruginosa in 7 (25%) and 5 (17.8%) patients respectively. Other culture yields are illustrated in Figure II.

FIGURE I: TREATMENT AND MANAGEMENT OF PLA (n=76)

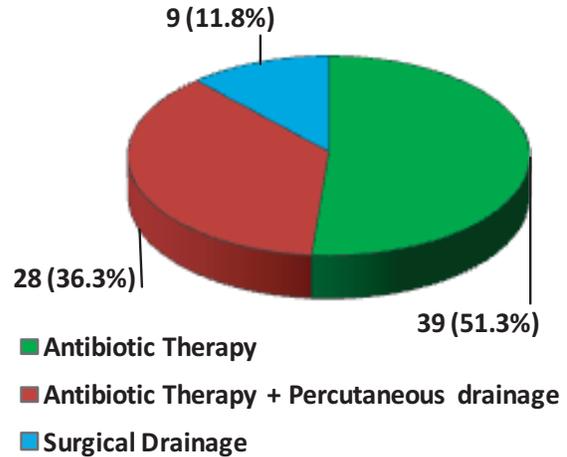
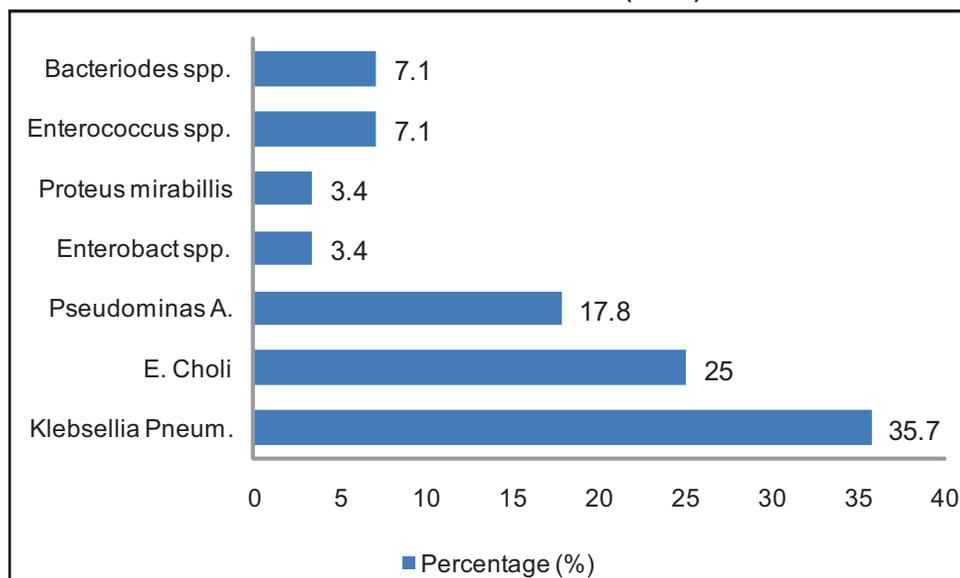


FIGURE II: CULTURE YIELDS OF ORGANISMS FROM THE PUS (n=28)



DISCUSSION

Pyogenic liver abscess (PLA) remains a common disease. The diagnosis is likely to be increased due to advances in medical sciences including the introduction of new imaging techniques like ultrasonography and computed tomography scan (CT scan). Over the past few decades significant changes have been observed in the etiology, diagnosis, bacteriology, treatment and outcome of the patients¹².

It was noticed in the past that disease was mostly in the third decade of life as mentioned by Oschner and colleagues³, but this pattern has changed to fifth decade which may be due to changing etiology from suppurative appendicitis to hepatobiliary causes^{3,12}. In this study the average age is 52yrs which corresponds to previous studies of recent past¹². Males have always been found to have more PLA as compared with females contributing greater than 70% of the patients^{13,21,22}. Our data also showed 76.6% in males.

Clinical features of upper abdominal pain (82%) and fever (75%) were the most significant symptoms which shows resemblance with other studies^{10,13,15,18}. Right hypochondrium tenderness (43%), hepatomegaly (30%) were the most common signs noticed in our study while jaundice was present in 18.4% of patients. Work done by Mohsin¹¹, Bugti¹³ and their colleagues showed right hypochondrium tenderness 54% and 20% respectively; while Mohsin et al noticed hepatomegaly in only 30% of patients. Similarly, jaundice has been noticed less than 25% in patients diagnosed to have PLA^{11,13,15,16}.

Pyogenic liver abscess is an infective disease; therefore leucocytosis has always been an important hematological feature along with anemia. Our results

showed leucocytosis in 71% and anemia in 43% patients. Similar results have been reported by different authors in the past noticing it in more than 70% of patients^{11,13,15,16,18}. However we found increased frequency of anemia (43% patients) than other studies that reported it to be 33%¹³. This variability could be due to different areas and ethnic groups of various studies conducted worldwide. This study was conducted in poorly developed area of Karachi with a lot of financial burden which effects their nutritional status. Biochemical analysis showed raised alkaline phosphatase, ALT, and total bilirubin levels in 63%, 60.5% and 52.6% patients respectively. These results do not show any significant difference from other studies showing these liver markers abnormal in more than 50% of patients^{10,11,16,18}.

In last decade the diagnostic imaging has played a major role in early diagnosis of liver abscess and due to advances in the field of ultrasonography it has become a standard for detection of liver abscess^{7,9}. Ultrasonography was done in all patients in present study and it showed abscesses in right lobe in 85% patients. Bugti and colleagues showed it to be 95% in right lobe of liver in patients of Balouchistan province of Pakistan¹³. While Rustam and colleagues found it to be in 74.1% in right lobe of liver of patients residing in Karachi²¹. Data of Western and far Eastern countries showed right lobe involvement in 60-75% of patients presenting with PLA. Single abscess was noticed in 84.2% of patients included in our study which is similar to the results of Bugti¹³ and other workers showing solitary pyogenic liver abscess in more than 80% of patients^{15,16}. These results are more or less the same as present study. Percutaneous drainage under ultra-

sound was done in > 8cm size single abscess as well as multiple abscesses. Multiple abscesses were reported as predictive factors for early aspiration of liver abscess regardless of the etiology²¹. Similar intervention was adapted by Bugti and colleagues¹³. Only 9 (11.8%) patients having abscess size >8cm failed to respond after early aspiration and their sizes were gradually increased therefore referred to surgical department for further interventional procedures. Study done at a UK centre showed 15% of patients referred for surgery and percutaneous catheter drainage¹¹. Klebsiella pneumonia was the most common organism noticed in 35.7% of pus cultures (followed by Escherichia coli, Pseudomonas aeruginosa and others), which is comparable with the earlier reports of Bugti, Joseph and other studies done in this region^{10,13,18-20}. Therapeutics (third generation cephalosporins and metronidazole) were given in 51.3% of patients having size <8cm for 4 to 6 weeks as suggested by reports from the literature²³. Although there is a wide range of mortality rates worldwide showing to be from 2.8% to 30%^{10,11,17-19}, no mortality was noticed in this study as probably due to early diagnosis, treatment, timely ultrasound guided percutaneous needle aspiration. This was a retrospective study so there were some limitations of this study. The cause of the abscess was not evaluated which is a major pitfall of the study. The results represent experience in a single centre, and may not be the same in other institutions due to variables.

CONCLUSION

Pyogenic Liver Abscess can be managed with much better outcome if diagnosed early with ultrasonography assistance. There should always be high suspicion of index in all patients presenting with right upper abdominal pain, tenderness, fever and increased leucocyte count. The clinical signs may not always support the diagnosis, therefore an early ultrasound, necessary intervention and appropriate therapy may improve the patient as well as reduce the chances of surgical intervention. This may also reduce the mortality.

REFERENCES

1. Adams F. The genuine works of Hippocrates. New York: W. Wood, 1986.
2. Johannsen EC, Sifri CD, Madoff LC. Pyogenic liver abscess. *Infect Dis Clin North Am* 2000;14:547-63.
3. Oschner A, Debarkey M, Murray S. Pyogenic abscess of liver. *Am J Surgery* 1938; 40:292-314.
4. Alvarez PJA, Gonzalez JJ, Baldonado RF, et al. Clinical course treatment and multivariate analysis of risk factors for Pyogenic Liver Abscess. *Am J Surg* 2001;181:177-86.
5. Seeto RK, Rockey DC. Pyogenic Liver Abscess: Changes in etiology, management and outcome. *Medicine (Baltimore)* 1996; 75:99-113.
6. Giorgio A, Stefano De G, Sarno Di A. Percutaneous needle aspiration of multiple pyogenic abscesses of liver: 13 yr single centre experience. *Am J Res* 2006;187:1585-90.
7. Mortele KJ, Segatto E, Ros PR. The infected liver: radiologic-pathologic correlation. *RadioGraphics* 2004;24:937-955.
8. Van SE, Wittich GR, Goodare BW. Percutaneous abscess drainage: update. *World J Surg* 2001;25:362-369.
9. Bergert H, Kersting S, Pyrc J. Therapeutic options in the treatment of pyogenic liver abscess. *Ultraschall Med* 2004;25:356-362.
10. Joseph R, Tina W, Valenio O. Pyogenic liver abscess: recent trends in etiology and mortality. *Clinical Infect Dis* 2004;39:1654-59.
11. Mohsen AH, Green ST, Read RC. Liver abscess in adults a ten year experience in a UK centre. *Q J Med* 2002;95:799-802.
12. Woung WM, Woung BC, Hui CK, et al. Pyogenic liver abscess: retrospective analysis of 80 cases over a 10yr period. *J Gastroenterol Hepatol* 2002;17:1001-1007.
13. Bugti QA, Baloch MA, UI Wadood A. Pyogenic liver abscess: demographic, clinical, radiological and bacteriological characteristics and management strategies. *Gomal J Med Sci* 2005;3(1):10-14.
14. Kheen-Siang C, Chin-Min C, Kuo-Chen C. Pyogenic liver abscess: a retrospective analysis of 107 patients during 3 year period. *Japan J Infect Dis* 2005;58:366-368.
15. Ka-Ho L, Kam-Fu L, King-Kong L. Pyogenic liver abscess: clinical profile, microbiological characteristics and management in Hong Kong Hospital. *J Microbiol Immunol Infect* 2008;41:483-490.
16. Leiw KVS, Lau TC, Ho CH. Pyogenic liver abscess. A tropical centre's experience in management with review of current literature. *Singapore Med J* 2000;41(10):489-492.
17. Joyce YHH, Michel KWY, Allen L. Pyogenic liver abscesses caused by Klebsiella Pneumoniae: US appearance and aspiration findings. *Radiology* 2007;242:769-776.
18. Ching-Chang Y, Chi-Hua Y, Mao-Wang H. Comparison of Pyogenic liver abscess caused by non-Klebsiella Pneumoniae and Klebsiella Pneumoniae. *J Microbiol Immunol Infect* 2004;37:176-184.
19. Feng-Chiao T, Yu-Tsung H, Luan-Yin C. Pyogenic liver abscess as endemic disease in Taiwan.

- Emerging Inf Dis 2008;14:1592-1600.
20. Shiaun-Chih C, Yuan-Ti L, Kuang-Chi L. Risk factors of developing metastatic infection from pyogenic liver abscess. *Swiss Med Wkly* 2006;136:119-128.
21. Rustam K, Saeed H, Shahab A. Predictive factors of early aspiration in liver abscess. *World J Gastroenterology* 2008;14(13):2089-2093.
22. Siddique AS, Tariq MS, Sumbal R. An audit of guided percutaneous needle aspiration of liver abscess. *Pak J Med Res* 2001;40(1);0-
23. Bamberger DM. Outcome of medical treatment of bacterial abscesses without therapeutic drainage: review of cases reported in the literature. *Clin Infect Dis*. 1996;23;592-603.



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