Original Research Article

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Liver abscess in children: challenges in management

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ABSTRACT

Background: Liver abscess (LA) is an important cause of morbidity in children. It is more common in developing countries than the developed world. Since it is common in India, we have tried to evaluate the clinical profile of pediatric liver abscess and management protocol.

Methods: This was a retrospective, observational, cohort study. The duration was from February 2011 to August 2016. All the patients with liver abscess were included in it. The patients were evaluated for their complaints, possible predisposing factors, mode of diagnosis, interventions, if any, and duration of stay. Intervention was made according to the ultrasonography abdomen and the number and amount of abscess cavities.

Results: There were 32 patients. The mean age of patients was 5.52 years. The clinical features were fever (25, 78%), pain in right hypochondrium (19, 59%), abdominal distension (4, 12.5%), subacute intestinal obstruction (2, 6.25%), and peritonitis (2, 6.25%). Rupture of abscess was noted in three patients. Conservative management was successful in three patients. USG guided needle aspiration was successful in 5 patients. Pigtail insertion was needed in 21 patients. Laparotomy was performed in three patients. One patient with severe sepsis and coagulopathy expired. All other patients were discharged.

Conclusions: LA is an important cause for morbidity in children. If not taken care of, it may lead to rupture and mortality. High index of suspicion, early screening, and appropriate intervention in form tailored management may fetch good results.

Keywords: Amoebic liver abscess, Children, Liver abscess, Pyogenic liver abscess, Treatment

INTRODUCTION

Liver abscess (LA) is an important cause of morbidity in children. Pyogenic liver abscess (PLA) is an infrequent infection in children. Despite this, most of the (80%) pediatric hepatic abscesses are pyogenic, followed by amebic liver abscess (ALA). Though most of the times, it may respond to conservative measures, the complications may be life-threatening. In a study from India, the incidence of PLA has been found to be 79/100000 pediatric admissions. The incidence of ALA is not clearly present in literature; however, it has been found to be endemic in certain parts of world like

Thailand, India, Egypt, and South Africa.⁵ Since it is common in India, we have tried to evaluate the clinical profile of pediatric liver abscess and management protocol.

METHODS

This was a retrospective, observational, cohort study conducted in the Department of Pediatric Surgery of the University Hospital. The duration was from February 2011 to August 2016. All patients of liver abscess were included in it. The patients were evaluated for their complaints, possible predisposing factors, mode of

diagnosis, interventions, if any, and duration of stay. Microbiological analysis of the pus was undertaken. Antibiotic treatment included ceftriaxone, amikacin and metronidazole in specific doses. On the basis of culture reports, changes in drug prescription, if needed, were made.

All patients were initially started on antibiotic treatment and evaluated with ultrasonography (USG) abdomen. In case of a single cavity of 50-100 ml of PLA, aspiration was performed. Pre intervention liver functions, including prothrombin, time (PT), prothrombin concentration (PC), and international normalized ratio (INR), were analysed. Aspiration was only undertaken with normal values of PT, PC and INR. In case of a cavity of more than 100 ml of PLA, pig tail catheter was placed under USG guidance. If a patient presented with acute abdomen, laparotomy was performed after assessment of the patient (Figure 1). If the patient was suspected of having an ALA, intravenous (IV) metronidazole was started. In case the distinction between PLA and ALA was not possible, aspiration was undertaken. Serial follow up was done with USG abdomen.

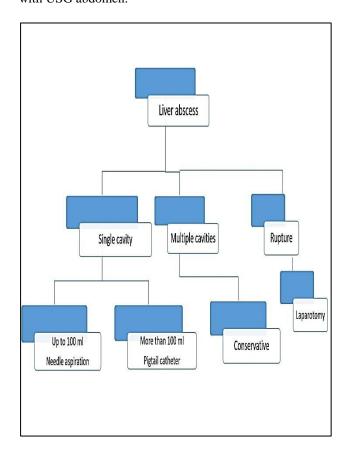


Figure 1: Management algorithm in children of liver abscess.

In case of doubt in diagnosis on the basis of USG abdomen, contrast enhanced computed tomography (CECT) scan was performed. Multiple liver abscesses were initially managed by IV antibiotics. Based on the response to treatment and USG findings, further

management in form of aspiration of any enlarging abscess cavity or continuation of IV antibiotics was undertaken. The patients were discharged on resolution of the cavity on the basis of USG, and followed in the out patients department (OPD).

RESULTS

During the study period of 5½ years, there were 32 patients. The mean age of patients was 5.52 years (range 1month-12 years). Male to female ratio was 1.4:1. The clinical features were fever (25, 78%), pain in right hypochondrium (19, 59%), abdominal distension (4, 12.5%), peritonitis due to rupture of abscess (3, 9.3%), and subacute intestinal obstruction (2, 6.25%).

Total patients 32 (N = 32).

Table 1: Way of presentation.

Main complain	No. of patients
Fever	n = 25 (78%)
Pain (right hypochondrium)	n = 19 (59%)
Abdominal distension	n = 04 (12.5%)
Peritonitis	n = 03 (09.3%)
Subacute intestinal obstruction	n = 02 (06.25%)

Table 2: Diagnostic modalities.

Methods of diagnosis	No. of patients
USG	n = 24 (75%)
CECT	n = 5 (15%)
Diagnosis made during laparotomy	n = 3 (9%)

Table 3: Sites of abscess.

Site	No. of patients
Right lobe of liver	n = 23 (71.8%)
Left lobe of liver	n = 03 (09.3%)
Multiple liver abscesses	n = 06 (18.7%)

Table 4: Treatment approach.

Treatment modality	No. of patients
Conservative management	n = 03 (09.3%)
USG guided aspiration	n = 05 (15%)
Pig tail insertion	n = 21(65.62%)
Laparotomy	n = 03 (09.3%)

USG abdomen revealed LA in 24 (75%) patients. In 5 (15%) patients, there was a dilemma on USG as the diagnosis was doubtful. CECT confirmed the diagnosis in these patients. Three (9%) patients with peritonitis were diagnosed intraoperatively. The abscess was in right lobe in 23 (71.8%), multiple in 6 (18.7%), and left lobe in 3 (9.3%) patients. Conservative management was successful in three patients. USG guided needle

aspiration was successful in 5 patients. Pigtail insertion was needed in 21 patients. Laparotomy was performed in three patients. One patient with multiple liver abscesses had co-existing splenic abscess. It responded to the conservative management. There was rupture of abscess in right pleural space in one patient, for which intracostal drain (ICD) placement was performed.

The mean duration of stay was 12.33 days (range 1-33 days). The culture report was pyogenic in 27 patients. Of these, it was polymicrobial in 15, sterile in 10, and Staphylococcus aureus in 2 patients. Amebic culture was present in 5 patients. One patient with severe sepsis and coagulopathy expired. All other patients were discharged. Four patients were discharged with pigtail catheter. It was removed in follow up period when USG abdomen revealed minimal collection in the liver cavity.

DISCUSSION

Though LA is common in developing countries, it is uncommon in developed countries, except in cases of septicemia or in children with major debilitating diseases, granulocyte dysfunction, or immunosuppression. ^{4,6} LA may occur from an ascending infection via the umbilical and portal veins, haematogenous spread, or via the biliary tree, or via direct contiguous spread from neighbouring structures. ⁷ Despite the knowledge about the etiopathogenesis of liver abscess, the gold standard of investigations and treatment is still debatable in developing countries. ⁶

The exact etiology of LA in this study is not clear in most of the patients. ALA defines cause in five patients. In all patients of PLA, there was no defining factor. However, all of them belonged to poor socio-economic status, suggesting poor hygenic conditions leading to gastro-intestinal infections. This probably led to ascending or blood borne hepatitis, which resulted in LA. This; however, is a speculation as we do not have any specific evidence for it. Low socioeconomic status, precarious lifestyle, anemia, and malnutrition have been found to be predisposing factors of LA.³

As mentioned in literature, most of the patients in this series had PLA (84%). This is close to what is reported in literature.² The clinical features of pain and fever has also been noticed by others.² Male to female ratio was 1.4. Other studies have also found nearly same ratio.³ The exact reason for more occurrence in male children is unknown.¹ This is in contrary to some other studies, where no sex predilection has been found.⁸⁻¹⁰. The mean age at diagnosis was 5.5 years. This is somewhat lesser as compared from other studies- both from developing and the developed world, where the age group is about 8-10 years.⁸⁻¹¹

USG has been the mainstay of diagnosis of LA. 12,13 The ultrasonic appearance of a typical liver abscess has been described as having the following criteria: acoustic

enhancement, abscess wall, peripheral halo, septation, and internal debris. ¹³ At times, it may be difficult to differentiate LA from other liver masses such as necrotic neoplasm, hematoma, and complicated (hemorrhagic or inflammatory) cyst. ¹⁴ This was also faced by us, where an abscess was diagnosed as a probable hepatoblastoma. CECT abdomen may be advantageous in such scenario. This was found true by us. CECT also has the advantage of visualizing the posterior and superior aspects of the liver.

In case of multiple abscesses, drainage is usually not possible; hence, conservative treatment is needed. In case the abscess cavity appears as if it can respond to single aspiration, there is no need for a long term drainage device such as pig tail catheter. For this reason, we opted for aspiration in cavities up to 100 ml. However, in case of a large abscess, repeated aspirations may incite more traumas in children; hence, placement of pig tail catheter may be more suitable. However, this claim may be further verified in a large comparative study. Rupture of an abscess does not provide any opportunity except an urgent laparotomy to clear the peritoneal cavity of the pus.

There may be a query as to why we did not provide conservative management in ALA, as it does not need any intervention. Clinical distinction between amebic and pyogenic liver abscess may be difficult at times. Amebic serology is nearly 95% sensitive and specific, but in areas of high prevalence like India, false positivity is a problem. DNA PCR from the aspirate is nearly 100% sensitive and specific, but lacks widespread availability. Given these limitations in our setup, we treated all abscesses at par.

CONCLUSION

LA is an important cause for morbidity in children. If not taken care of, it may lead to rupture and mortality. High index of suspicion, early screening and appropriate intervention in form tailored management may fetch good results.

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institutional ethics committee

REFERENCES

- 1. Sharma MP, Kumar A. Liver abscess in children. Indian J Pediatr. 2006;73:813-7.
- 2. Hsu YL, Lin HC, Yen TY, Hsieh TH, Wei HM, Hwang KP. Pyogenic liver abscess among children in a medical center in Central Taiwan. J Microbiol Immunol Infect. 2015;48:302-5.
- 3. Ba ID, Ba A, Faye PM, Diouf FN, Sagna A, Thiongane A. Particularities of liver abscesses in

- children in Senegal: Description of a series of 26 cases. Arch Pediatr. 2016;23:491-6.
- 4. Kumar A, Srinivasan S, Sharma AK. Pyogenic liver abscess in children South Indian experiences. J Pediatr Surg. 1998;33:417-21.
- 5. Salles JM, Moraes LA, Salles MC. Hepatic amebiasis. Braz J Infect Dis. 2003;7:96-110.
- 6. Fievet L, Michel JL, Harper L, Turquet A, Moiton MP, Sauvat F. Management of pediatric liver abscess Arch Pediatr. 2012;19:497-500.
- 7. Simeunovic E, Arnold M, Sidler D, Moore SW. Liver abscess in neonates. Pediatr Surg Int. 2009;25:153-6.
- 8. Chou FF, Chen SM, Chen YS, Chen MC. Single and multiple pyogenic liver abscesses: Clinical course, etiology and results of treatment. World J Surg. 1997;21:384-8.
- 9. Tsai CC, Chung JH, Ko SF, Liu PM, Su CT, Li WC, et al. Liver abscess in children: a single institutional experience in southern Taiwan. Acta Paediatr Taiwan. 2003;44:282-6.
- 10. Muorah M, Hinds R, Verma A, Yu D, Samyn M, Mieli-Vergani G, et al. Liver abscesses in children:

- A single center experience in the developed world. J Pediatr Gastroenterol Nutr. 2006;42:201-6.
- 11. Ferreira MA, Pereira FE, Musso C, Dettogni RV. Pyogenic liver abscess in children: Some observations in the Espirito Santo State, Brazil. Arq Gastroenterol. 1997;34:49-54.
- 12. Lai MW. Ultrasound diagnosis of liver masses in children. Pediatr Neonatol. 2012;53:79-80.
- Chuang CC, Wu SF, Chen AC, Tsai MF, Lin CY, Chen W. Pitfalls in a sonographic diagnosis of liver abscess in children. Pediatr Neonatol. 2012;53:98-104.
- 14. Newlin N, Silver TM, Stuck KJ, Sandler MA. Ultrasonic features of pyogenic liver abscesses. Radiology 1981;139: 155-9
- 15. Srikant KP, Thapa BR, Lal SB. Gastrointestinal fistulisation in amebic liver abscess. Indian Pediatr. 2016;53:253-5.

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