

Liver Abscess in children: A retrospective chart review

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I. Introduction:

Pyogenic liver abscess (PLA) is a potentially life threatening illness, associated with significant morbidity and mortality worldwide¹. The global reported incidence for PLA is variable, ranging from 3 to 25 per 100,000 pediatric hospital admissions²⁻⁵. PLA is reported to be rare in the developed world, although it is a significant cause of morbidity in children in the developing countries. It has been suggested that the overall incidence of PLA is increasing because of a wider availability of diagnostic procedures. The mortality rate has decreased because of the use of draining techniques, earlier identification of immunocompromised patients, and more effective antibiotic treatment⁵. Most LA in children is pyogenic in nature with amoebic liver abscesses constituting 21–30% of cases⁶⁻⁷. Among cases of pyogenic liver abscesses, Staphylococcus is the leading cause in most series^{6, 8}. Recently, there has been a change in the management of liver abscess from open surgical drainage (OSD) to more conservative percutaneous drainage along with antimicrobial therapy⁷. Majority of reported cases have occurred among immunocompromised children^{4,5,9}. Only a few cases have been reported among otherwise healthy children, mostly from developing countries^{1,7,10-13}. Prompted by our observation that most of the cases of PLA were otherwise healthy children, we reviewed all cases of PLA admitted in the pediatric wards of our hospital over the past 3 years. Our interest was further strengthened by the fact that the diagnosis, management and outcome have undergone much change over past few decades with significant reduction in morbidity and mortality¹⁴⁻¹⁶. There is little data about the characteristics of pediatric liver abscess in our region, and management of our patients has been based on data provided by studies conducted and published in developed countries.

II. Aim and Objective:

The aim of this study was to identify the characteristics of LA in children referred to our centre over the last 3 years and to review their baseline characteristics, clinical features, radiological and lab findings, management, complications and final outcome.

III. Material and Methods:

The present retrospective observational study was conducted in the Department of Pediatrics of a tertiary care teaching hospital in North India. Medical records of children aged below 14 years, admitted with a clinical diagnosis of liver abscess within a period of three years from July 2017 to June 2020 were retrieved and analyzed. The clinical and demographic details were recorded including age, sex, symptoms and their duration and clinical signs at presentation. The laboratory findings at admission were also noted including haemoglobin, total leukocyte count, differential leukocyte count, platelet count, liver function tests, blood and pus culture with sensitivity pattern and ultrasonography (USG) findings. The management details including antibiotic therapy and its duration and drainage procedure were also recorded. The details of course during hospital stay were also recorded for each patient including any complications, total duration of hospital stay and outcome in terms of mortality or discharge. Length of hospital stay was defined as total days since admission to discharge. The data collected was analyzed using appropriate statistical tests.

IV. Results:

In our study, out of thirty children, 60% were males and 40% were females. Majority of children in the study were between five to ten years of age and least affected age group was between ten to fourteen years. In our study the most common presentation was fever (100%), followed by pain abdomen (80%), followed by diarrhea, vomiting and decreased appetite. (**Table 1**) Tender hepatomegaly was the most common sign which was present in almost all the patients (97%).

Table 1: Table showing clinical characteristics of children with Liver abscess

| Parameter | Number (Percentage) |
|---------------------|---------------------|
| Male gender | 18 (60) |
| Age in years | |
| 0-5 years | 9 (30) |
| 5-10 years | 14 (46.7) |
| 10-14 years | 7 (23.3) |
| Presenting symptoms | |
| Fever | 30 (100) |
| Pain abdomen | 24 (80) |
| Diarrhea | 11 (36.7) |
| Vomiting | 07 (23.3) |
| Decrease appetite | 07 (23.3) |
| Cough | 01 (3.3) |

Table 2: Investigation findings and management of children with Liver abscess

| Investigations | Number (percentage) |
|---|---------------------|
| Ultrasound | |
| Single abscess | 28 (93.3) |
| Right lobe | 26 (86.6) |
| Left lobe | 2 (6.6) |
| Multiple abscesses | 2 (6.6) |
| Blood culture positive | 1 (3.3) |
| Anemia | 14 (46.7) |
| Leukocytosis | 27 (90) |
| Raised liver enzymes SGOT/SGPT >200U/L | 4 (13.3) |
| Raised Serum bilirubin | 4 (13.3) |
| Pus culture positive | 3 (10) |
| Management | |
| Conservative only | 24 (80) |
| Surgical drainage needed | 6 (20) |

In complete haemogram, leucocytosis (90%) was the predominant finding followed by anemia (46.6%). Ultrasound examination detected liver abscess in all the patients but computerized tomography was advised in large abscesses which were large in size and had a risk of rupture. Single abscess was present in almost 94% children with predominant involvement of right lobe and only two children had multiple liver abscesses. (**Fig 1**) Liver enzymes were raised in only four patients (13.3%). Three patients showed growth of Staph aureus in their pus culture and blood culture was positive in one patient with growth of E.Coli. Conservative management was the mainstay of therapy in the present study. Eighty percent children were managed on conservative therapy only and only six patients needed surgical drainage in the form of aspiration. (**Table 2**)

V. Discussion:

The incidence of PLA among infants and children has been variously reported, ranging from 3 to 25 per 100,000 pediatric hospital admissions^{2,5}. The majority of patients in our study were otherwise healthy, except for three children who were having severe acute malnutrition. Other studies, from developing countries, have also documented several cases of liver abscess among otherwise healthy children^{1,10,11}. Fever, abdominal pain, and tender hepatomegaly were present in the majority of cases. This was the observation in several other studies^{1,4,5,9,10,17}. Ultrasound scan was found to be sensitive in detecting and localizing abscesses. In present study diagnosis of liver abscess could be established in all cases with ultrasonography along with other laboratory findings. Ultrasonography was equally useful in the follow-up of these patients. With successful treatment there was a progressive decrease in the size of the abscesses. In our study, pus culture was positive for Staphylococcus aureus in three patients, similar finding of Staph being the most common cause of LA in children is reported¹⁸. In one child, Escherichia coli were isolated from the blood culture. Anaerobic organisms are increasingly being reported as a causative agent in PLA in children^{7,19}. The low level of positive blood culture and pus culture in our study could partly be due to prior antibiotic therapy before admission. Third generation cephalosporin with vancomycin and metronidazole was started as optimum initial antibiotic regimen in children. Out of all patients started on this regimen, 28 patients showed improvement and only two patients {case 4 and 13} required revision of antibiotics and case no 13 died on the seventh day of admission due to septic shock. Drainage is no longer considered a must in all cases of PLA in adults^{7,19}. Similarly, 24 (80%) out of 30 patients did not require any surgical drainage. Few other studies have also shown good outcome with conservative management⁷. The mortality rate in our study was 3.33% which is lower than those reported in earlier series^{4,5,10}. The duration of hospital stay ranged from 14 days to 42 days. Abscess drainage is warranted in cases with liquefied large abscesses, in which there is risk of rupture or when there is lack of response after

48 to 72 hours of appropriate antibiotic therapy. Percutaneous aspiration is safe, effective and also avoids the problems of open drainage.

VI. Conclusion:

Any child presenting with fever, abdominal pain, and tender hepatomegaly should be subjected to ultrasound scan for early detection of Liver Abscess. Staph. aureus is the commonest causative agent. A combination of third generation cephalosporin, Vancomycin and metronidazole is a satisfactory initial coverage. Conservative management is needed in majority of the patients and when required, percutaneous needle aspiration is safe and effective. Resolution and significant reduction in mortality has been made possible by early detection and optimum antibiotic therapy.

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Fig 1: CT abdomen showing multiple liver abscesses

