AJPMHS GLOBAL RESEARCH NETWORK

AMERICAN Journal of Pediatric Medicine and Health Sciences

Volume 4, Issue 05, 2026 ISSN (E): 2993-2149

Modern Aspects of Diagnosis and Treatment of Hepatic Echinococcosis in Children

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Abstract: A retrospective analysis of diagnostic and treatment outcomes was performed in 21 children with hepatic echinococcosis treated between 2015 and 2026. The patients were aged 4 to 16 years. All children underwent ultrasonography, multislice computed tomography (MSCT), laboratory and serological investigations. All patients received surgical treatment combined with antiparasitic therapy using albendazole. Boys predominated among the examined patients — 14 (66.7%), while girls accounted for 7 (33.3%). Solitary hepatic hydatid cysts were identified in 17 (81.0%) children, while two cysts were detected in 4 (19.0%) patients. Concomitant pulmonary echinococcosis was diagnosed in 4 (19.0%) children. The postoperative period was uneventful in 18 (85.7%) patients. Complications developed in 3 (14.3%) children.

Keywords: Hepatic Echinococcosis, Pediatric Surgery, Albendazole Therapy

Introduction

Echinococcosis is a chronic parasitic disease caused by infection with the eggs of tapeworms of the genus Echinococcus granulosus. In childhood, echinococcosis represents a major clinical problem due to its prolonged latent course, delayed diagnosis, and the possibility of severe complications. In recent years, endemic regions have demonstrated an increasing incidence of echinococcosis among children. According to the literature, children under 14 years of age account for 15–25% of all cases. In E. granulosus infection, cysts most commonly develop in the liver (70%) and lungs (20%)[1]. However, in 10–15% of patients, involvement of two organs may occur depending on geographic region and parasite strain. Ultrasonography and multislice computed tomography are currently considered the main and highly informative methods for diagnosing hepatic parasitic cysts. The diagnosis is confirmed by serological testing, including fluorescent antibody and indirect hemagglutination assays. Despite advances in diagnostic technologies, surgery remains the main treatment modality. Nevertheless, issues related to early diagnosis, optimal surgical strategy, prevention of postoperative complications, and effective antiparasitic therapy remain subjects of ongoing discussion[2].

Objective

To evaluate the results of diagnosis and surgical treatment of hepatic echinococcosis in children.

Methods

A retrospective analysis was conducted of 21 children with hepatic echinococcosis who underwent inpatient treatment at the clinical bases of the Department of Pediatric Surgery of Tashkent State

Medical University between 2015 and 2026. The patients were aged 4–16 years. The study group included 14 (66.7%) boys and 7 (33.3%) girls. All children underwent comprehensive examination including clinical assessment, laboratory testing, serological studies, ultrasonography (US), and multislice computed tomography (MSCT). Statistical analysis was performed using descriptive statistical methods. Solitary hepatic hydatid cysts were diagnosed in 17 (81.0%) children, whereas two hepatic cysts were identified in 4 (19.0%) patients. Concomitant pulmonary echinococcosis was detected in 4 (19.0%) children, including involvement of the left lung in 3 patients and the right lung in 1 patient.

Results and Discussion

In the diagnosis of hepatic echinococcosis in children, imaging methods played a leading role, with ultrasonography and MSCT demonstrating the highest diagnostic value. Modern imaging techniques allowed timely detection of parasitic cysts, determination of their size, localization, number, relationship to vascular and biliary structures, and identification of disease complications[3].

Ultrasonography of the abdominal organs was performed in all 21 patients and served as the primary screening method. US enabled assessment of cyst localization, size, number, capsule thickness, presence of daughter cysts, cyst content characteristics, signs of suppuration or calcification, and the condition of the bile ducts. Solitary hepatic cysts were identified in 17 (81%) children and multiple cysts in 4 (19%) patients. In addition, ultrasonography was used for postoperative follow-up[4].

MSCT was performed in all 21 patients to clarify the topography, size, and number of cysts and their relationship with vascular and biliary structures. The method provided detailed visualization of the liver and allowed accurate evaluation of the topographic and anatomical features of cystic lesions. The advantages of MSCT included high spatial resolution, three-dimensional reconstruction, precise assessment of the relationship between cysts and major vessels and bile ducts, detection of calcifications, diagnosis of complications, and identification of combined organ involvement. Concomitant pulmonary echinococcosis was additionally detected in 4 patients, which facilitated appropriate treatment planning[5].

The most common laboratory abnormalities included anemia, eosinophilia, and elevated liver enzymes (Table 1).

Table 1. Laboratory blood changes in children with hepatic echinococcosis(n = 21)

Blood parameter	Number of patients	%
Anemia	19	90.5
Leukocytosis	7	33.3
Eosinophilia	18	85.7
Increased ALT and AST	17	81.0
Hyperbilirubinemia	9	42.9

Most children demonstrated signs of inflammatory response and impaired liver function, indicating a pronounced systemic effect of the parasitic process.

Serological testing for echinococcal antibodies was performed in 9 (42.9%) children and was used as an additional method for diagnostic verification[6].

The predominant clinical manifestations were pain in the right hypochondrium in 17 (81%) patients and dyspeptic disorders in 3 (14.3%) children. In 4 (19%) cases, the disease was asymptomatic and diagnosed incidentally during examination[7].

All patients underwent surgical treatment. Depending on cyst size, localization, and anatomical

characteristics, different surgical procedures were performed: open echinococcectomy with capitonnage of the residual cavity in 7 (77.8%) patients, drainage of the residual cavity in 1 (11.1%) child, and omentoplasty (omentum tamponade) in 1 (11.1%) patient. During surgery, antiparasitic safety principles were strictly observed, including isolation of the operative field and treatment of the cavity with scolicidal solutions[8].

The postoperative period was uneventful in 18 (85.7%) children. Complications developed in 3 (14.3%) patients: suppuration of the residual cavity in 1 child and biliary fistula formation in 2 children. Suppuration required repeat surgery with cavity sanitation and drainage. The biliary fistulas were transient and resolved with conservative treatment within two weeks.

An important component of comprehensive treatment was antiparasitic therapy with albendazole, which reduced the risk of recurrence and parasite dissemination. The number of treatment courses depended on the extent of disease and the patient's condition. For anti-relapse therapy, at least three courses of treatment were recommended after surgery[9].

All 21 patients received albendazole at a dose of 10 mg/kg/day divided into two doses every 12 hours for 28 days. The drug was administered with fatty meals to improve bioavailability. Intervals between courses were 14 days. Liver function and complete blood count monitoring were performed before treatment and every 14 days during the first course. Elevated transaminases (ALT and AST) were observed in 7 (33.3%) patients, while leukopenia developed in 1 (4.7%) child. In cases of leukopenia, therapy was discontinued until normalization of blood parameters. Albendazole therapy was administered together with supportive dietary management. Hepatoprotective and desensitizing agents reduced adverse effects during prolonged treatment[10].

The present study demonstrated that hepatic echinococcosis in children occurs more frequently in boys, which is consistent with previously published data. Ultrasonography and MSCT were the main diagnostic methods and showed high diagnostic accuracy in determining cyst localization, size, and number. The high prevalence of anemia, eosinophilia, and elevated transaminase levels reflects the significant impact of parasitic invasion on the child's body[11-13].

The presence of concomitant pulmonary echinococcosis in some patients confirms the necessity of comprehensive examination in children with this pathology. Surgical intervention remains the main method of treatment for hepatic echinococcosis[14].

The use of albendazole in the preoperative and postoperative periods contributes to a reduction in recurrence risk and parasite dissemination.

Postoperative complications were relatively uncommon in our study. Biliary fistulas were temporary and successfully managed conservatively. The obtained results confirm the effectiveness of a comprehensive approach to the treatment of hepatic echinococcosis in children[15].

Conclusions

Hepatic echinococcosis in children occurs more frequently in boys and is predominantly characterized by solitary liver cysts.

Modern diagnosis of hepatic echinococcosis in children should be comprehensive and include clinical, laboratory, serological, and imaging methods. Combined use of ultrasonography and MSCT significantly improves diagnostic accuracy, allows determination of disease stage, assessment of complication risk, and selection of optimal surgical strategy.

Surgical treatment combined with antiparasitic therapy using albendazole is an effective treatment method for hepatic echinococcosis in children.

Postoperative complications occur relatively infrequently and, in most cases, can be successfully managed using conservative and surgical approaches.

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