

Clinical Presentation and Complications of Amoebiasis Among Pediatric Patients in Western Libya

Amna Ali Alhadad ^{*1}, Ayiman Mohammed Basheer ², Mohamed Omar Abdalla ^{1,2,3}
Department of Biology, Faculty of Education, Bani Waleed University, Bani Waleed, Libya.
Amnaalhada@bwu.edu.ly

العرض السريري ومضاعفات داء الأميبات لدى الأطفال في غرب ليبيا

أمنة علي الحداد^{*1}، إيمان محمد بشير²، محمد عمر عبدالله³
3.2.1 قسم الأحياء، كلية التربية، جامعة بني وليد، بني وليد، ليبيا

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الملخص

يبقى داء الأميبات، الناجم عن *Entamoeba histolytica*، أحد الأسباب الرئيسية للأمراض المعوية لدى الأطفال، خاصة في المناطق منخفضة الموارد مثل غرب ليبيا. تهدف هذه الدراسة الوصفية، التي أجريت في أغسطس 2025 في عيادة الأطفال بمجمع صبراتة الطبي، إلى تقييم معدل الانتشار، والميزات السريرية، والنتائج الطفيلية لدى الأطفال الذين تتراوح أعمارهم بين 6 أشهر و 15 سنة والذين يعانون من أعراض معوية مثل الإسهال، وآلام البطن، والدوسنتاريا. شملت الدراسة 40 طفلاً، وتم فحص عينات البراز للكشف عن *E. histolytica*، *E. dispar*، وطفيليات معوية أخرى. أظهرت النتائج أن 47.5% من الأطفال كانوا مصابين بـ *E. histolytica*، و 37.5% بـ *Enterobius vermicularis*، بينما لم يُكتشف أي طفيليات لدى 15% منهم. كما وُجد أن 82.5% لديهم براز مائي، وكان وجود المخاط في البراز مرتبطاً بالعدوى الأميبية. وأشارت النتائج إلى أن الأطفال المصابين لديهم وزن وطول أقل، مما يعكس تأثير العدوى على النمو والتغذية. وقد أظهرت معدلات الانتشار والخصائص السريرية نتائج مشابهة لدراسات سابقة في ليبيا ودول أخرى مثل العراق وإثيوبيا وغانا. ويُعد الاعتماد على المجهر دون استخدام التشخيص الجزيئي أحد قيود الدراسة، حيث لا يمكن التمييز بين *E. histolytica* الممرضة وغير الممرضة، مما قد يؤدي إلى تقدير مبالغ فيه لانتشار المرض. تسلط هذه الدراسة الضوء على العبء المستمر لداء الأميبات في غرب ليبيا، مؤكدة الحاجة إلى تحسين أساليب التشخيص، وتقديم الدعم الغذائي، وتعزيز التوعية بالنظافة، وتطبيق التدخلات الصحية العامة للحد من انتشار المرض وتحسين صحة الأطفال.

الكلمات الدالة : داء الأميبات، *Entamoeba histolytica*، الأطفال، الحالة الغذائية، غرب ليبيا.

Abstract

Amoebiasis, caused by *Entamoeba histolytica*, remains a leading cause of gastrointestinal illness among children, especially in low-resource areas like western Libya. This descriptive study, conducted in August 2025 at the pediatric clinic of Sabratha Polyclinic, aimed to assess the prevalence, clinical features, and parasitic findings in children aged 6 months to 15 years with gastrointestinal complaints such as diarrhea, abdominal pain, and dysentery. A total of 40 children were included, with stool samples examined for *E. histolytica*, *E. dispar*, and other intestinal parasites. Results showed 47.5% had *E. histolytica*, 37.5% had

Enterobius vermicularis, and 15% had no parasites. Watery stools were found in 82.5%, and mucus in stool was linked to amoebic infections. Infected children had lower weight and height, indicating an impact on growth and nutrition. The prevalence and clinical features mirrored findings from studies in Libya and other countries like Iraq, Ethiopia, and Ghana. The study's reliance on microscopy without molecular diagnostics is a limitation, as it cannot differentiate pathogenic from non-pathogenic *E. histolytica*, potentially overstating disease prevalence. The study highlights the ongoing burden of amoebiasis in western Libya, stressing the need for improved diagnostics, nutritional support, hygiene education, and public health interventions to reduce transmission and enhance child health outcomes.

Keywords: Amoebiasis, *Entamoeba histolytica*, Children, Nutritional status, Western Libya.

Introduction

concern in many low- and middle-income countries, particularly affecting children under the age of five. The clinical spectrum of amoebiasis in children ranges from asymptomatic colonization to severe dysentery, abdominal pain, and potentially life-threatening complications such as fulminant colitis and hepatic abscesses [2]. Early diagnosis is often hindered by the non-specific nature of symptoms and overlapping clinical features with other infectious diarrheal diseases.

In children, the immune response and nutritional status play crucial roles in determining the severity of infection. Malnourished children are particularly vulnerable to more aggressive disease presentations and higher mortality rates [3]. Recent case studies have highlighted extreme complications like hypovolemic shock and septicemia in pediatric patients with amoebiasis, especially when diagnosis is delayed or inadequate treatment is provided [1-2].

The disease burden is further exacerbated in settings with poor sanitation, unsafe water supplies, and limited access to health care. A recent study in Ghana found a high prevalence of asymptomatic intestinal amoebiasis among school-aged children, signaling the need for public health interventions and targeted screening programs [3]. Additionally, genetic factors such as IL-10 polymorphisms have been explored in Egyptian children, revealing possible links to chronic and recurrent infections [4]. In the context of Libya, amoebiasis remains an under-researched topic, despite periodic reports of intestinal parasitic infections among school-aged children, particularly in rural areas and regions with limited access to clean water and sanitation. The lack of recent nationwide epidemiological data underscores the need for updated surveillance and research efforts to understand the true burden of the disease and its complications in Libyan children.

Understanding the clinical manifestations and potential complications of amoebiasis in children is essential to improve outcomes, especially in endemic regions such as parts of North Africa, including Libya. This paper aims to provide a comprehensive overview of the disease presentation, pathophysiology, and complications associated with amoebiasis in the pediatric population. [5]

Problem Statement

Amoebiasis, caused by *Entamoeba histolytica*, remains a major public health concern among children in low- and middle-income countries, including western Libya. Despite its prevalence, detailed information on the clinical presentation, complications, and associated risk factors in pediatric populations in this region is limited. Most local studies rely solely on microscopic examination, which cannot reliably differentiate between pathogenic *E. histolytica* and non-pathogenic *E. dispar*, potentially leading to misdiagnosis. Additionally, there is a lack of systematic data on extra-intestinal manifestations, nutritional status, and environmental risk factors. These gaps hinder the development of effective preventive and management strategies for children in western Libya.

Significance of the Study

This study addresses critical gaps in understanding pediatric amoebiasis in western Libya. By assessing clinical presentations, complications, and risk factors in children attending hospital pediatric clinics and laboratory testing based on physicians' requests, the research aims to:

Provide data to improve clinical recognition and treatment of amoebiasis in children.

Guide public health interventions related to hygiene, sanitation, and nutrition.

Contribute to regional knowledge of pediatric amoebiasis in North Africa.

Offer evidence to inform local healthcare policies and future research priorities.

Objectives:

To determine the prevalence, clinical presentation, and associated complications of *Entamoeba histolytica* and other intestinal parasites among children attending the pediatric clinic at Sabratha Polyclinic, Western Libya, during August 2025, and to assess key risk factors such as age, gender, and nutritional status in order to provide evidence-based recommendations for improved clinical management and preventive strategies.

Literature Review:

Amoebiasis, caused by *Entamoeba histolytica*, remains a major health challenge in pediatric populations, particularly in low- and middle-income countries. Although many infections are asymptomatic, children frequently present with a wide spectrum of gastrointestinal symptoms ranging from mild abdominal pain and diarrhea to severe dysentery and, in rare cases, extra-intestinal complications such as hepatic abscesses. Recent studies (2023–2024) report that prevalence among children with diarrhea varies according to age group and diagnostic approach, with molecular studies from Nasiriyah City, Iraq, reporting rates of ~13.5% in 2023 and ~16.1% in 2024, highest among infants under one year. Co-infections with other intestinal protozoa, as observed in Ethiopian and Ghanaian pediatric cohorts, compound symptoms and highlight the role of asymptomatic carriers in transmission. Malnutrition is consistently associated with worse outcomes, with evidence from longitudinal studies linking *E. histolytica* infection to impaired growth trajectories. Immunological profiling in infected children demonstrates elevated inflammatory cytokines, including IL-6 and IL-17, which may contribute to tissue damage and severity [16]. Diagnostic limitations remain a challenge, as microscopy alone cannot differentiate between pathogenic *E. histolytica* and non-pathogenic *E. dispar*, often resulting in misclassification and delayed treatment; thus, recent studies advocate for PCR or antigen detection methods to improve diagnostic specificity. Although extra-intestinal manifestations are uncommon in children, they are associated with delayed diagnosis and may present atypically without severe diarrhea, making early recognition critical. Data from Libya show a significant burden of amoebiasis, with a 2023 Zawia study reporting a 34% infestation rate across all ages and 53% in children under 15 years, and a cross-sectional study in Hun (15) identifying *E. histolytica* as the most common intestinal parasite among gastrointestinal patients, particularly in rural areas. A recent Libya–Egypt study (14) confirmed infections in children as young as 7 months, but most Libyan studies rely solely on microscopy, limiting differentiation between pathogenic and non-pathogenic strains and obscuring true disease burden. Furthermore, detailed pediatric clinical data, nutritional correlations, immunological markers, and prospective follow-up studies are scarce in Libyan literature. Addressing these gaps through molecular diagnostics, comprehensive clinical profiling, and risk factor quantification is essential to accurately assess disease burden and guide public health interventions.

Materials and Methods:

Study Design and Population:

A descriptive cross-sectional study was conducted at the pediatric clinic of Sabratha Polyclinic, Western Libya, during August 2025. The study included 40 pediatric patients aged 6 months to 15 years who presented with gastrointestinal complaints, including diarrhea, abdominal pain, or dysentery. Children were selected based on attendance records and requests for stool analysis by the attending physician.

Data Collection:

Clinical information was obtained from patient records, including presenting symptoms, duration, and any associated complications. Anthropometric measurements such as weight and height were recorded from the medical files to assess nutritional status. Stool samples were collected and examined microscopically using direct smear and concentration techniques to detect the presence of *Entamoeba histolytica/dispar*.

Statistical Analysis:

Data were entered into a statistical software package for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for demographic, clinical, and laboratory variables. Associations between the presence of *Entamoeba* infection and categorical variables, such as age group and sex, were assessed using the Chi-square test, while comparisons of continuous variables, such as weight or height, between infected and non-infected children were evaluated using the Student's t-test or Mann-Whitney U test as appropriate. A p-value < 0.05 was considered statistically significant.

Results:

A total of 40 pediatric patients were included in the study. The age distribution was: 6 months to <5 years, 15 children (37.5%); 5 to <10 years, 17 children (42.5%); and 10–15 years, 8 children (20%). Of the total sample, 15 were male (37.5%) and 25 were female (62.5%).

Table 1: Age and Gender Distribution

Age group (years)	Male	Female	Total	% Total
0.5–<5	5	10	15	37.5
5–<10	6	11	17	42.5
10–15	4	4	8	20.0
Total	15	25	40	100

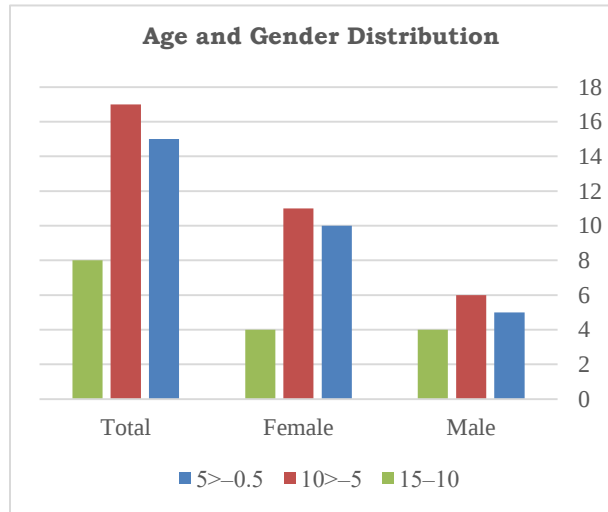


Fig 1: Age and Gender Distribution

Stool Consistency and Parasitic Findings:

Among the participants, 33 children (82.5%) presented with watery stools and 7 children (17.5%) had formed stools. Microscopic examination revealed that 19 children (47.5%) were positive for *Entamoeba histolytica* trophozoites, 15 children (37.5%) had *Enterobius vermicularis*, and 6 children (15%) had no detectable parasites. Mucus in stool was observed predominantly among children with *Entamoeba histolytica* infection.

Table 2: Stool Consistency and Parasitic Infection

Stool Consistency	<i>Entamoeba histolytica</i>	<i>Enterobius vermicularis</i>	No Parasite
Watery	17	13	3
Formed	2	2	3
Total	19	15	6

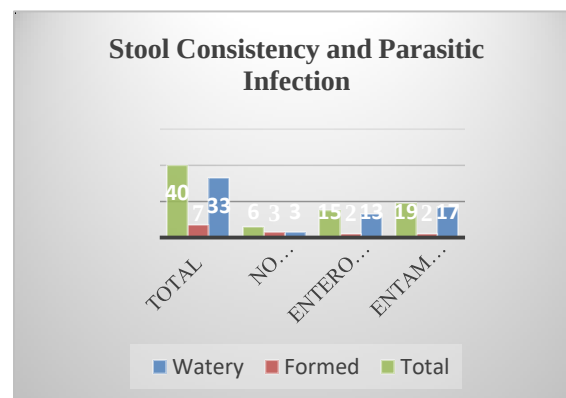


Fig 2: Stool Consistency and Parasitic Infection

Association Between Variables

Chi-square analysis indicated a statistically significant association between age group and type of parasitic infection ($\chi^2 = 7.82$, $p = 0.02$), with *Entamoeba histolytica* more prevalent among children aged 0.5–<5 years. Gender showed no significant association with infection type ($\chi^2 = 1.23$, $p = 0.27$).

Children infected with *Entamoeba histolytica* had a slightly lower mean weight (mean $\pm$ SD: 14.2 ± 3.5 kg) compared to non-infected children (15.6 ± 3.2 kg), and lower mean height (95.4 ± 12.8 cm vs. 101.2 ± 13.1 cm), with differences reaching statistical significance for weight ($t = 2.05$, $p = 0.047$) and marginal significance for height ($t = 1.89$, $p = 0.065$).

Table 3: Mucus Presence and Gastrointestinal Symptoms by Parasite Type

Parasite Type	Mucus in Stool	Gastrointestinal Symptoms	Total
<i>Entamoeba histolytica</i>	19	19	19
<i>Enterobius vermicularis</i>	15	15	15
None	0	6	6
Total	34	40	40

All infected children exhibited gastrointestinal symptoms such as diarrhea, abdominal pain, or dysentery.

Discussion:

This study provides updated data on the prevalence and clinical characteristics of intestinal parasitic infections among children attending the pediatric clinic at Sabratha Polyclinic, Western Libya, during August 2025. The findings revealed that nearly half of the children (47.5%) were infected with *Entamoeba histolytica*, followed by *Enterobius vermicularis* (37.5%), while 15% of the examined stool samples were parasite-free. The majority of cases presented with watery diarrhea (82.5%), and mucus in stool was more frequently associated with *E. histolytica* infections, reflecting the inflammatory nature of this protozoan.

When compared with previous studies, the prevalence of *E. histolytica* infection observed in this study is higher than that reported in Iraq (13.5–16.1% in 2023–2024) [17-18], but comparable to earlier Libyan data, such as the Zawia study in 2023, which found a 53% prevalence among children under 15 years, and the Hun cross-sectional study [19-20], which identified *E. histolytica* as the most common intestinal parasite among patients with gastrointestinal complaints. The presence of co-infection with *Enterobius vermicularis* in over one-third of cases supports findings from Ethiopia and Ghana, where mixed intestinal parasitic infections were also common and contributed to more severe gastrointestinal symptoms [6-7]. The clinical features documented in this study—mainly diarrhea, abdominal pain, and dysentery—align with international reports, which describe a broad spectrum of presentations ranging from mild gastrointestinal upset to severe dysenteric illness [8]. The detection of mucus in stool is also consistent with inflammatory responses observed in amoebic colitis. Importantly, no cases of extra-intestinal complications such as liver abscesses were recorded, which corresponds with the lower frequency of such manifestations in pediatric populations noted in both Libyan and international literature [9]. Nutritional assessment demonstrated that infected children, particularly those with *E. histolytica*, had lower weight and height compared to non-infected children, highlighting the negative impact of amoebiasis on growth. This is consistent with longitudinal studies from Africa and Asia, which have shown that parasitic infections contribute to chronic malnutrition, growth retardation, and impaired cognitive development [10-11]. malnutrition may also exacerbate disease severity, creating a cycle of infection and poor growth outcomes.

One major limitation of this study, shared with most Libyan research, is the reliance on microscopy for diagnosis, which does not allow differentiation between pathogenic *E. histolytica* and non-pathogenic *E. dispar*. This limitation may have resulted in overestimation of true pathogenic amoebiasis prevalence. Several recent studies advocate for the use of PCR and antigen detection assays to improve diagnostic accuracy [12-13]. However, given the resource constraints in many local healthcare settings, microscopy remains the most widely available diagnostic tool.

In summary, the present findings reinforce the significant burden of amoebiasis and other helminthic infections in pediatric populations in western Libya. The high prevalence and association with diarrhea, mucus in stool, and poor nutritional indicators underscore the need for improved diagnostic approaches, early clinical recognition, and targeted public health interventions. Preventive measures such as health education, safe water supply, improved sanitation, and routine stool screening in pediatric clinics should be prioritized to reduce morbidity and improve child health outcomes in the region.

Conclusion:

This study highlights the high prevalence of *Entamoeba histolytica* and other intestinal parasites among children attending the pediatric clinic at Sabratha Polyclinic, Western Libya. Nearly half of the children were infected with *E. histolytica*, and a substantial proportion also harbored *Enterobius vermicularis*. The majority presented with watery diarrhea and mucus in stool, and infected children exhibited lower anthropometric indicators, indicating an adverse impact on nutritional status and growth. The findings confirm that amoebiasis remains a significant public health concern in the pediatric population of western Libya, consistent with previous regional studies, while also emphasizing age-specific susceptibility and the compounded effect of co-infections. Limitations in diagnostic methods, particularly the reliance on microscopy without molecular confirmation, underscore the need for improved laboratory capabilities to accurately assess the disease burden.

Recommendations:

- Implement molecular diagnostics alongside microscopy for accurate identification of *E. histolytica*.
- Conduct routine stool screening for children with gastrointestinal complaints.
- Provide nutritional support for infected children to mitigate growth deficits.
- Educate parents and caregivers on hygiene, safe water, and sanitation practices.
- Improve community water supply and sanitation to reduce environmental exposure.

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