

SCHISTOSOMIASIS IN A NON-ENDEMIC REGION: A DIAGNOSTIC CHALLENGE. A CASE REPORT.

Abstract:

Schistosomiasis is a neglected tropical parasitic disease that may cause chronic gastrointestinal and hepatosplenic complications. The case report of a 26-year-old man with a 10-month history of abdominal pain, intermittent diarrhea, progressive abdominal distension, persistent vomiting, and poor oral intake, who was initially diagnosed with Child–Pugh class B hepatic insufficiency. The patient had no conventional risk factors for chronic liver disease; however, epidemiological history revealed consumption and handling of freshwater snails (*Pachychilus indiorum*) and consumption of untreated spring water. Abdominal computed tomography demonstrated hepatic cystic lesions and ascites, while subsequent ultrasonography showed findings consistent with chronic liver disease. Stool examination revealed structures suggestive of *Cryptosporidium* oocysts, prompting a two-week course of nitazoxanide. Follow-up hepatic ultrasonography demonstrated a favorable evolution, with a reduction in the number of cystic lesions. Considering the clinical presentation, absence of conventional causes of chronic liver disease, and relevant freshwater exposure, schistosomiasis was considered as a possible underlying etiology. This case highlights the diagnostic challenges of schistosomiasis in non-specific clinical presentations and emphasizes the importance of a detailed epidemiological history and confirmatory testing in patients with unexplained hepatobiliary disease.

Key words:-

schistosomiasis; hepatic schistosomiasis; parasitic infection

Introduction: -

Schistosomiasis is an acute parasitic disease that may progress to a chronic condition and is caused by trematode worms of the genus *Schistosoma*. It is also known as “bilharziasis,” in honor of Theodor Bilharz, the German physician who first identified the parasite in 1852.

Schistosomiasis is the parasitic disease associated with the highest morbidity and mortality worldwide after malaria. According to data from the World Health Organization (WHO), in 2019 approximately 700 million people lived in areas at risk of transmission, of whom at least 236 million were estimated to be infected.¹ The disease is endemic in more than 78 countries across tropical and subtropical regions of Africa, South America, the Middle East, East Asia, and the Philippines. Sub-Saharan Africa bears the greatest burden, accounting for most annual cases and the highest levels of schistosomiasis-related morbidity and mortality.

Schistosomiasis is classified by the WHO as a neglected tropical disease and has been targeted for elimination as a public health problem by 2030, with active control and elimination strategies being implemented worldwide.^{1,2}

Human infection occurs when the larval forms of the parasite, released by infected freshwater snails, penetrate the skin during contact with contaminated freshwater.

Transmission is sustained when individuals infected with *Schistosoma* contaminate freshwater sources with parasite eggs excreted in feces or urine. Once these eggs reach freshwater, they hatch and release larval stages that continue the parasite's life cycle.

After entering the human body, the larvae develop into adult schistosomes. Adult worms reside within blood vessels, where female worms produce and release eggs. Some eggs are excreted from the body in feces or urine, thereby continuing the parasite's life cycle. Others become trapped within host tissues, where they trigger immune and inflammatory responses that progressively lead to tissue and organ damage.³

Unlike many other chronic liver diseases, hepatic schistosomiasis is characterized by marked periportal fibrosis in the absence of substantial hepatocellular injury. Consequently, hepatic function may remain relatively preserved despite severe portal hypertension and its associated complications, including esophageal varices and splenomegaly.

Clinical and epidemiological assessment is essential for establishing the diagnosis, particularly in patients who reside in or have traveled to endemic areas. Schistosomiasis is traditionally diagnosed by detecting parasite eggs in stool or urine specimens. In addition, the detection of *Schistosoma*-specific antibodies or circulating parasite antigens in blood or urine samples may provide evidence of infection.⁴

Case report

A 26-year-old man presented with a 10-month history of abdominal pain alternating with episodes of diarrhea, followed by progressive abdominal distension secondary to ascites. On November 6, 2024, he was admitted to a Ministry of Health (SSA) hospital in San Cristóbal de las Casas, Chiapas, Mexico, where he was diagnosed with Child–Pugh class B hepatic insufficiency.

However, the patient had no known family history of liver disease or other conventional risk factors for chronic liver disease, including alcohol consumption, steatotic liver disease, obesity, use of herbal remedies, or prolonged self-medication. Relevant epidemiological exposures included handling and consumption of freshwater snails (*Pachychilus indiorum*) and consumption of untreated spring water. He also reported previous contact with family members diagnosed with tuberculosis. During the course of his illness, he developed progressive constitutional symptoms and persistent vomiting, resulting in poor oral intake.

Contrast-enhanced and non-contrast abdominal computed tomography (CT) performed on October 26, 2024, revealed findings consistent with gastritis, cystitis, and bilateral chronic pyelonephritis. Simple cystic lesions were identified within the liver, the largest measuring 41 × 36 mm and 29 × 24 mm. Free intraperitoneal fluid extending into the pelvic cavity was also observed, as well as narrowing of the L5–S1 intervertebral disc space.

Fourth-generation rapid HIV tests performed on November 21 and November 25, 2024, were negative.

On November 21, 2024, Ziehl–Neelsen staining was negative, with no evidence of malignant cells in the examined specimen. Stool parasitological examination performed on the same date showed hard-consistency stools without mucus and with a small amount of blood (+). No cysts, trophozoites, larvae, helminth eggs, or yeasts were identified. However, rare structures suggestive of *Cryptosporidium* oocysts (0–1 per microscopic field) were reported.

On November 28, 2024, tumor marker testing showed a CA-125 level of 68.71, CA 19-9 of 82.50, and carcinoembryonic antigen (CEA) of 1.40. Hepatitis B surface antigen and anti-hepatitis C virus antibodies were negative.

On November 29, 2024, adenosine deaminase (ADA) testing was negative, with a value of 9.72 U/L. Western blot testing performed on the same date was also negative.

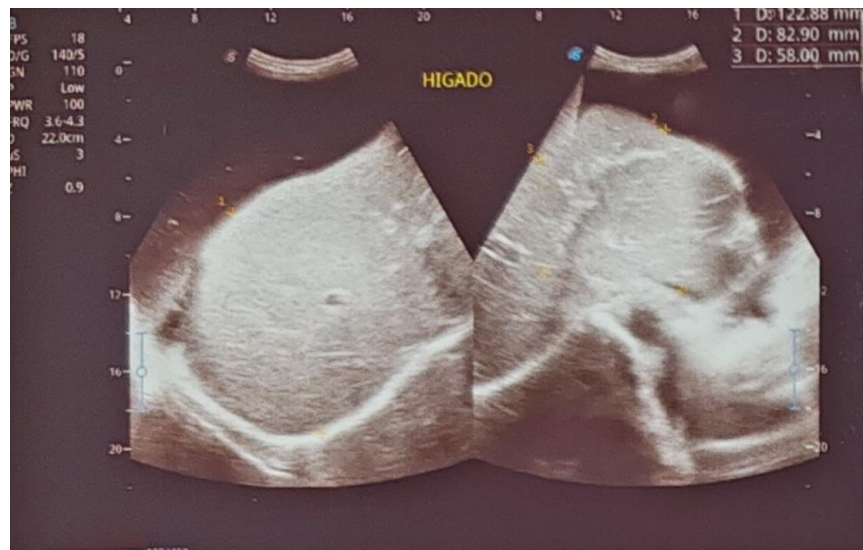
Abdominal ultrasonography performed on December 6, 2024, demonstrated sonographic features of chronic liver disease, a probable cyst in the left hepatic lobe, bilateral chronic pyelonephritis, gastric distension, non-tense ascites, and findings suggestive of adynamic ileus.

Histopathological examination of ascitic fluid, reported on December 14, 2024, demonstrated reactive mesothelial cells associated with nonspecific inflammation, without evidence of malignancy.

Given the stool examination findings suggestive of *Cryptosporidium* oocysts and the possibility of an underlying parasitic infection, treatment with the antiprotozoal agent nitazoxanide was initiated and administered for two weeks.

Following nitazoxanide therapy, follow-up hepatic ultrasonography showed a favorable radiological evolution, with a reduction in the number of previously identified cystic lesions. In the context of the patient’s epidemiological history particularly exposure to and consumption of freshwater snails and untreated freshwater these findings raised clinical suspicion of schistosomiasis as a potential underlying diagnosis.

Figure 1. Liver Ultrasound Report



Liver: Lobulated in shape, in its usual anatomical position, hypotrophic, with irregular and discontinuous margins and contours, fibrous septa, and regenerative nodules on the surface. The echogenicity of the hepatic parenchyma is heterogeneous due to the presence of hyperechoic areas consistent with fibrosis and increased echogenicity of the portal spaces.

Figure 2. Left Hepatic Lobe Ultrasound



Left hepatic lobe: a well-defined, regular-bordered, completely anechoic lesion is identified, with posterior acoustic enhancement and no central vascularity, consistent with a cyst measuring 89.66 × 38.48 × 108.97 mm, with a volume of 452.64 cc.

Figure 3. Clinical Timeline of the Case

Date / Period	Event / Intervention	Key Findings
~ January 2024 (10 months before admission)	Onset of symptoms	- Abdominal pain alternating with episodes of diarrhea. - Progressive abdominal distension (ascites). - Constitutional symptoms and persistent vomiting. - Poor oral intake.
During the clinical course	Epidemiological exposures and risk factors	- Handling and consumption of freshwater snails (<i>Pachychilus indiorum</i>). - Consumption of untreated spring water. - Previous contact with family members with tuberculosis. - No family history of liver disease. - No conventional risk factors: alcohol use, steatotic liver disease, obesity, herbal remedies, or prolonged self-medication.
October 26, 2024	Abdominal CT scan	- Gastritis, cystitis, and bilateral chronic pyelonephritis. - Simple hepatic cystic lesions (largest 41 × 36 mm and 29 × 24 mm). - Free intraperitoneal fluid extending to pelvic cavity. - Narrowing of the L5–S1 intervertebral disc space.
November 6, 2024	Hospital admission	- Admitted to an SSA hospital in San Cristóbal de las Casas, Chiapas, Mexico. - Diagnosis: Child–Pugh class B hepatic insufficiency.
November 21, 2024	Initial infectious and parasitological workup	- HIV (4th generation): negative. - Ziehl–Neelsen: negative; no malignant cells. - Stool examination: hard-consistency stools, no mucus, small amount of blood (+). - No cysts, trophozoites, larvae, helminth eggs, or yeasts. - Rare structures suggestive of <i>Cryptosporidium</i> oocysts (0–1/microscopic field).
November 25, 2024	Repeat HIV testing	HIV (4th generation): negative.
November 28, 2024	Tumor markers and viral hepatitis screening	- CA-125: 68.71. - CA 19-9: 82.50. - CEA: 1.40. - Hepatitis B surface antigen: negative. - Anti-hepatitis C virus antibodies: negative.
November 29, 2024	Additional infectious workup	- Adenosine deaminase (ADA): 9.72 U/L (negative). - Western blot: negative.
December 6, 2024	Abdominal ultrasonography	- Sonographic features of chronic liver disease. - Probable cyst in the left hepatic lobe. - Bilateral chronic pyelonephritis. - Gastric distension, non-tense ascites, and findings suggestive of adynamic ileus.
December 14, 2024	Ascitic fluid histopathology	Reactive mesothelial cells with nonspecific inflammation, without evidence of malignancy.
December 2024	Antiparasitic treatment	Nitazoxanide administered for two weeks based on stool findings suggestive of <i>Cryptosporidium</i> oocysts and the possibility of a parasitic infection.
After 2 weeks of treatment	Follow-up ultrasonography	Favorable radiological evolution with a reduction in the number of previously identified hepatic cystic lesions.
Subsequent assessment	Suspected underlying diagnosis	Considering the radiological evolution and the epidemiological history of freshwater snail exposure and consumption of untreated freshwater, schistosomiasis was considered as a potential underlying diagnosis.

Discussion

Schistosomiasis is a parasitic disease caused by trematode worms of the genus *Schistosoma*. Despite being both preventable and treatable, it remains an important public health problem in many tropical and subtropical regions, disproportionately affecting communities with limited access to safe drinking water, adequate sanitation, and healthcare services.

From an epidemiological perspective, schistosomiasis is closely associated with poverty, inadequate sanitation infrastructure, and the broader burden of neglected tropical diseases. Transmission occurs when individuals come into contact with freshwater contaminated with cercariae released by infected freshwater snails, which serve as intermediate hosts in the parasite's life cycle. The complex interaction among environmental conditions, intermediate hosts, and human behavior highlights the need for an integrated approach to disease control. Such strategies should combine appropriate diagnosis and treatment with improved access to safe water and sanitation, health education, and measures aimed at reducing transmission.

The clinical manifestations of schistosomiasis vary according to the stage of infection, parasite species, intensity of infection, and organs involved. The disease may present in either acute or chronic forms. Acute schistosomiasis, also known as Katayama syndrome, is less common and generally occurs during the early phase of infection, particularly in previously unexposed individuals. Its manifestations may include fever, malaise, myalgia, abdominal symptoms, and eosinophilia.

Chronic schistosomiasis is more common and results primarily from the host immune response to parasite eggs retained within tissues. Depending on the *Schistosoma* species involved, the gastrointestinal, hepatosplenic, and genitourinary systems may be affected. Hepatosplenic disease can lead to periportal fibrosis, portal hypertension, splenomegaly, and gastroesophageal varices, whereas urogenital schistosomiasis may manifest as hematuria and chronic urinary tract pathology. Long-standing *Schistosoma haematobium* infection is also associated with an increased risk of squamous cell carcinoma of the urinary bladder. These chronic complications may substantially impair patients' quality of life and contribute to long-term morbidity.

The present case illustrates the diagnostic challenges associated with suspected schistosomiasis in a patient presenting with chronic liver disease, ascites, gastrointestinal manifestations, and an epidemiological history of freshwater exposure. The absence of conventional risk factors for chronic liver disease, together with the reported consumption of untreated spring water and exposure to freshwater snails, raised suspicion of a parasitic etiology. Nevertheless, these epidemiological and clinical findings are not specific for schistosomiasis, emphasizing the importance of parasitological, serological, antigen-based, histopathological, or molecular testing whenever available to establish the diagnosis.

An additional diagnostic challenge in this case was the initial identification of structures suggestive of *Cryptosporidium* oocysts in the stool examination, which prompted treatment with nitazoxanide. Although subsequent imaging demonstrated a reduction in the number of hepatic

cystic lesions, this radiological response alone cannot be considered confirmatory evidence of schistosomiasis. Praziquantel remains the standard treatment for schistosomiasis; therefore, the response observed after nitazoxanide should be interpreted cautiously and in conjunction with the patient's epidemiological history, clinical manifestations, and additional diagnostic findings.

Conclusion

Schistosomiasis remains an important public health problem affecting millions of individuals, particularly in tropical and subtropical regions where poverty, inadequate sanitation, and limited access to safe water facilitate transmission. Although effective treatment with praziquantel is available, persistent transmission, reinfection, limitations in access to diagnosis and treatment, and insufficient coverage of control programs continue to pose challenges to disease elimination.

Until an effective and widely available vaccine is developed, control strategies should focus on reducing transmission and preventing disease-related morbidity through timely diagnosis and treatment of infected individuals, improved water and sanitation infrastructure, health education, behavioral interventions, and appropriate control of intermediate snail hosts. An integrated approach that combines individual patient management with population-based preventive measures is essential to reduce the burden of schistosomiasis and advance toward its elimination as a public health problem.

References:

- 1) World Health Organization. Schistosomiasis [Internet]. Geneva: World Health Organization; [cited 2022 Apr 20]. Available from: WHO – Schistosomiasis
- 2) Ramalli L, Mulero S, Noël H, Chiappini JD, Vincent J, Barré-Cardi H, et al. Persistence of schistosomal transmission linked to the Cavu river in southern Corsica since 2013. *Euro Surveill.* 2018;23.
- 3) Kokaliaris C, Garba A, Matuska M, Bronzan RN, Colley DG, et al. Effect of preventive chemotherapy with praziquantel on schistosomiasis among school-aged children in sub-Saharan Africa: a spatiotemporal modelling study. *Lancet Infect Dis.* 2022;22(1):136-149. doi:10.1016/S1473-3099(21)00090-6.
- 4) Andrade ZA. Schistosomiasis and liver fibrosis. *Parasite Immunol.* 2009;31(11):656-663.