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Urogenital Schistosomiasis: A Diagnosis to Consider in Patients with Hematuria in Europe

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ABSTRACT

Introduction: Over 100 million people worldwide are affected by urogenital schistosomiasis, a disease caused by Schistosoma haematobium. Here, we report our experience with urogenital schistosomiasis.

Materials and Methods: We retrospectively evaluated patients with urogenital schistosomiasis between 2004 and 2012. Clinical and demographic variables were analyzed.

Results: All cases (5) occurred in male patients with a median age of 33.8 years (range: 14-47). All patients resided in or had visited endemic areas. The average time from the onset of symptoms to diagnosis was 19.5 weeks (1-52). Hematuria was the most common initial clinical sign in 3 cases (60%), 2 of which arose in a monosymptomatic form. One case presented with sepsis and acute renal failure (ARF), and another case presented atypically and was diagnosed in an organ donor candidate. Four cases exhibited consistent bladder calcifications that were found through radiographic imaging at the time of diagnosis. The parasite was identified in urine in 1 case (20%), and cystoscopy results were suspicious for 2 of them (40%). The chosen standard treatment was pharmacological (Praziquantel) after anatomopathological confirmation.

Conclusions: Given the high prevalence of schistosomiasis in sub-Saharan countries, the emergence of macro- or microscopic hematuria in immigrants or travelers requires comprehensive study and the consideration of schistosomiasis as a probable cause. Accurate diagnosis and early treatment can prevent complications from tissue inflammation caused by the parasite.

INTRODUCTION

FOver 100 million people worldwide, particularly in rural areas, are affected by urogenital bilharziasis, a parasitic disease caused by Schistosoma haematobium [1]. Given the high prevalence of schistosomiasis in sub-Saharan countries and the subsequent clinical implications, the appearance of macro- or microscopic hematuria in immigrants or travelers requires comprehensive study and the consideration of schistosomiasis as the probable cause [2-4]. According to a literature review of articles indexed in PubMed, few cases have been published in Spain in the last 15 years. The aim of this study is to describe the clinical characteristics of patients with a diagnosis of urogenital schistosomiasis at the Hospital Universitari Vall d´Hebron (Vall d´Hebron University Hospital), Barcelona.

MATERIALS AND METHODS

We retrospectively identified all patients suffering from schistosomiasis who were admitted to the Vall d´Hebron University Hospital over a period of 93 months between June 2004 and April 2012. Five patients were identified, and their medical records, laboratory tests, and images were evaluated. The following variables were examined: age, sex, country of origin, travel to endemic areas, laboratory tests, imaging results, and treatment.

KEYWORDS: Hematuria, schistosomiasis, Schistosoma haematobium, urine cytology

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Table 1. Demographic and clinical characteristics.

Parameters	
Patients nº	5
Age (years)	
Median (range)	33.8 (14-47)
Gender (%)	
Men/women	100/0
Nacionality (Spanish)	
Yes*	1 (20%)
No	4 (80%)
Time between onset of symptoms and diagnosis (weeks)	
Median (range)	19.5 (1-52)
Hematuria	
Yes	3 (60%)
No	2 (40%)
S. haematobium – orine analysis	
Ye	1 (20%)
No	4(80%)
Urine cultive	
Positive**	1 (20%)
Negative	4(80%)
IgG-serum	
Positive***	1 (20%)
Negative	4(80%)
Suspicious lesion on cystoscopy	
Yes	2 (40%)
No	3 (60%)
Suspicious calcifications – radiological examinations	
Yes	4 (80%)
Vesical	1
Ureteral	1
Vesical and ureteral	2
No	1 (20%)

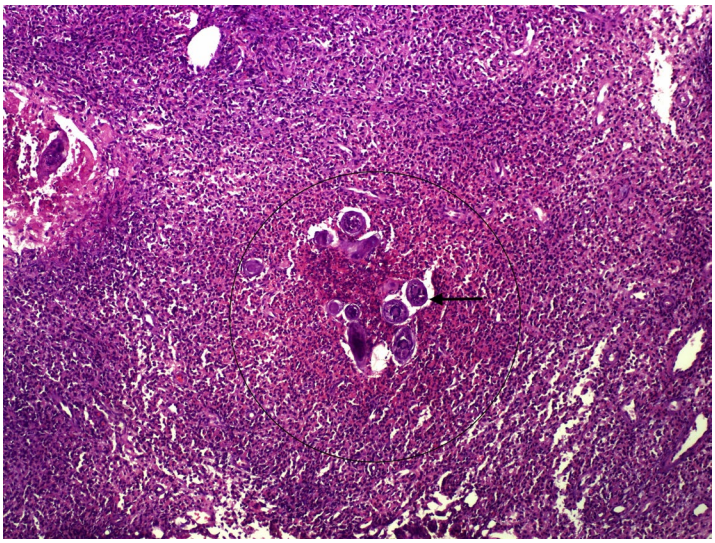
* patient with history of travel to endemic area
** E. coli isolated in urine culture
*** positive IgG S. mansoni especific

RESULTS

Demographic and clinical characteristics are presented in Table 1. All patients (5) were male, with a median age of 33.8 years (14-47); 80% were of African origin (2 from Senegal, 1 from Gambia, and another from Ghana). One patient was from Spain and had recently traveled to Mali. Of the cases (3), 60% presented with macroscopic hematuria: 2 cases in the monosymptomatic form and 1 case with associated lower back pain. One patient exhibited urinary sepsis with associated acute renal failure (ARF). An atypical case in an organ donor candidate was incidentally diagnosed by radiological imaging and biopsy. The mean time between the onset of symptoms and diagnosis was 19.5 weeks. The parasite was isolated in the urine in only 1 case (20%). Calcifications of the urinary tract (bladder or ureter) were observed in 80% of the cases; 2 patients exhibited bladder and ureteral calcifications, 1 patient exhibited only bladder calcifications, and another patient exhibited only ureteral calcifications. Approximately 40% of the patients exhibited suspicious lesions on cystoscopy (including 1 hypervascularized lesion and a verrucous lesion).

All of the patients received pharmacological treatment (Praziquantel) after definitive anatomopathological diagnosis (Figure 1), except for an incidental postmortem diagnosis. In 3 patients, the diagnosis was confirmed after transurethral resection (TUR), and in 1 other patient, the diagnosis was confirmed after nephroureterectomy. All patients exhibited complete remission of their symptoms and no evidence of the

Figure 1. Pathology. TURB, hematoxylin-eosin tecnic 10 x: eggs (black arrow) surrounded granuloma S. hematobium, intense inflammatory infiltrate (inside the bubble).



disease on later tests (urinalysis, cystoscopy).

DISCUSSION

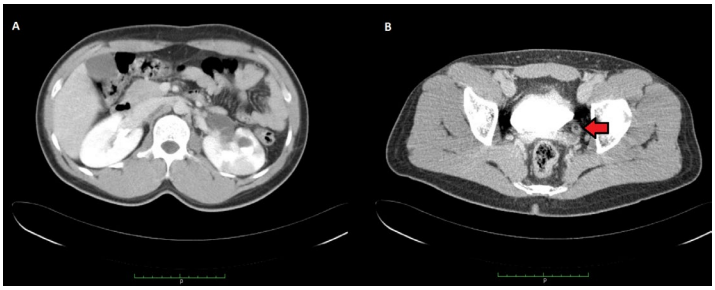
To date, this is the largest published case series of urogenital schistosomiasis in Spain. The parasite Schistosoma haematobium is widely distributed in the sub-Saharan African region, the East African coast, the Maghreb, Cyprus, and the Middle East [1]; all patients in our case series exhibited exposure to these regions.

The life cycle of this parasite is complex. The snail (Bulinus) is the intermediate host and releases the parasite's cercariae in the water. These larvae infect humans (main host) by penetrating the skin. The adult forms persist for decades within the venous plexus of the pelvic organs, bladder, rectum, pelvic ureters, and deep genital organs. Parasitic eggs result from sexual reproduction and migrate into these organs, causing mucosal microperforations. Repeated urothelial microlesions cause hematuria. After their elimination in the urine, the parasites become ciliated embryos or miracidium and infect snails, thus completing the life cycle [1,4].

Primary infection often goes unnoticed for years, as was the case in all of the patients in our series. All cases in our series exhibited a positive epidemiological history, including visits to endemic areas years before the appearance of the clinical signs. Occasionally, the initial infection causes irritation, itching, fever, or rash, producing the condition known locally as "swimmers itch" [5].

The active chronic phase of the disease is characterized by a significant increase in the egg population in the urothelium, causing hematuria. Hematuria was the most common symptom in our series and the reason for consultation in 60% of the patients. The only isolated case that did not exhibit hematuria was associated with lower back pain. A computed tomography (CT) scan revealed images suggestive of an upper urinary tract tumor, and a diagnosis of bilharziasis was established after nephroureterectomy, which is the standard treatment for a suspected malignancy of this type (Figure 2). Bladder lesions result in inflammation, sclerosis, calcifications, loss of bladder capacity, and bladder neck stenosis, which may subsequently favor the development of bladder neoplasia. Most bladder tumors associated with bilharzias are squamous cell carcinomas. In addition, there is also an associated increase in the incidence of transitional cell carcinoma, which are more aggressive, of high-grade, recur frequently, and affect younger people [1,6,7]. The intense granulomatous inflammatory response and irreversible fibrous lesions produced in response to the parasitic eggs can cause ureteral stenosis (3 patients) and consequent progressive loss of renal function, eventually causing terminal renal disease [1,5]. In our series, 1 patient exhibited an atypical form of urinary sepsis associated with ARF, and the patient exhibited a baseline creatinine of 1.6 mg/dL in subsequent control tests. This likely represents a case of chronic renal disease due to obstructive uropathy secondary to chronic schistosomiasis, diagnosed following urinary sepsis.

Figure 2. TAC: A. Globular left kidney with hydronephrosis. B. Left pelvic ureter with thickened walls (stenosis) causing secundary retrograde hydronephrosis.



Aberrant localization of the parasite has been described, typically in patients from endemic areas [8]. The diagnosis of schistosomiasis is based on the presence of parasite eggs in the urine. Based on the number of eggs identified, it is possible to classify the magnitude of the infection [1] (< 100 mild, 100-400 moderate, > 400 severe). Serological tests have little utility in screening for this disease. First, they are unable to differentiate the mild from severe infections. Second, cross-reactions with other parasites are common [1], as was observed in 1 patient in our series (positive IgG serology for S. mansoni). Radiology allows us to assess sequelae in the urinary tract. The images typically demonstrate a calcified bladder or "porcelain bladder," which constitutes a pathognomonic radiological finding of chronic urinary schistosomiasis [9]. CT scans are necessary in cases in which renal or upper urinary tract tumors are suspected. The cystoscopic findings are typical: erosions, mucosal congestion, nodules, and red sessile lesions. Cystoscopy is typically followed by transurethral resection of the suspicious area, and a definitive diagnosis is established after confirming the presence of the parasitic egg [1,4,8].

Treatment with Praziquantel usually induces remission of the inflammatory response caused by the oviposition and promotes healing of the infection in the majority of cases. Meanwhile, scar lesions persist despite eradication of the parasite (Figure 3) [1,5,10].

CONCLUSION

Given the high prevalence of schistosomiasis in sub-Saharan countries and the subsequent clinical implications, the appearance of macro- or microscopic hematuria in immigrants or travelers requires comprehensive study and the consideration

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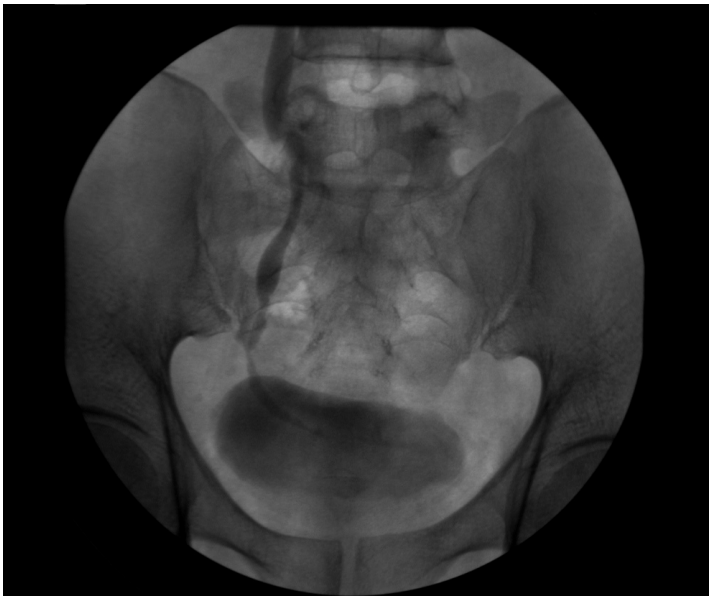
Figure 3. Intravenous urography 1.5 years following treatment with praziquantel: moderate pelvic dilatation up ureter chronic stenosis.



of schistosomiasis as a probable cause. Accurate diagnosis and early treatment can prevent complications from tissue inflammation caused by the parasite.

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