Rev Esp Sanid Penit 2012; 14: 62-66

Diagnosis and treatment of bladder schistosomiasis from penitentiary primary care: Case report

A Bedoya del Campillo, PA Martínez-Carpio, MJ Leal, N Lleopart

Medical Services. Young Offenders center in Barcelona, Generalitat de Catalunya

ABSTRACT

We describe a case of a patient from Senegal with voiding symptoms and microscopic hematuria diagnosed and treated for bladder schistosomiasis in the medical services of the Youth Prison in Barcelona. According to our information in the Medline database no bladder schistosomiasis cases have been seen in primary care outside endemic areas. Patients can be diagnosed and treated before referral to specialized care for further study of possible complications.

Key words: schistosomiasis; bilharziasis; urinary tract infection; hematuria; emigration and immigration; primary health care; prisons; infection.

Text received: 09-01-2012

Text accepted: 05-05-2012

INTRODUCTION

Schistosomiasis, or bilharzia, affects over 200 million people worldwide and is the second most important parasitic disease after malaria. Cases recorded in Europe and North America regard immigrant patients or in those who have travelled or resided in countries where such disease is endemic. It is caused by trematode flatworms of the genus *Schistosoma* [1-5].

People become infected when larval forms of the worm, or cercaria, released by certain freshwater snails, penetrate the skin in contact with contaminated water. Snails are intermediary hosts part of the parasite's lifecycle and which become infected themselves by eggs released with human urine or faeces. Infection takes place by contact with water in ponds, rivers or swamps where larval forms of the worms (cercaria) can be found. Swimming and fishing are the main activities related to this infection. The species *S. mansoni*, *S. japonicum*, and other less frequent, cause the intestinal form of the disease. Adult worms often gather in mesenteric venules, generally asymptomatically, although in long term infections symptoms such as asthenia, abdominal pain, intermittent diarrhea, blood in faeces, and in more advanced cases portal hypertension, hepatic fibrosis and ascites, may occur. In such cases, diagnosis is mainly established through the identification of eggs in the faeces (1-5). However, the species *S. haematobium* presents a special tropism towards perivesical plexus and the urinary system [6-8]. Approximately 50% of the cases recorded in Europe concern immigrants from sub Saharan African countries, especially from Western Africa according to the sentinel epidemiological record of the European Network for the diagnosis of imported diseases [9].

Urinary or bladder schistosomiasis depends of the contact with infecting forms of *Schistosoma haematobium* (cercaria) which penetrate the skin in contact with contaminated water. Many of the cases published in non endemic countries have been identified in immigrants from Nigeria [5], Ghana [4], Gambia [7], Mali [6, 8] and other sub-Saharan countries, and less frequently in individuals from Maghreb, the Middle East and other tropical areas [4, 7]. When the cercaria penetrates the skin it reaches the circulation and suf-

fers a process of migration, maturing and metamorphosis. The adult female of S. haematobium selectively nests around pelvic organs ad releases hundreds of eggs every day, which penetrate the bladder and the mucous membrane of the inferior part of ureters and are released with the urine. Unlike the intestinal form, urinary schistosomiasis is usually symptomatic with an unspecific irritative syndrome, pollakiuria, suprapubic pain during urination and other symptoms suggesting urinary infection. Intermittent symptoms are usually caused by bacterial overinfections, mainly by Gram-negative bacteria which are frequently found in parasitic hosts because they nest in urinary tissues already damaged by the Schistosoma. Macroscopic or microscopic hematuria (very usual) is often terminal, intermittent and recurrent [3-8]. At this stage, the bladder becomes affected with an edematous mucosa with granuloma, polyps and ulceration. Biopsies usually show abundant eosinophils and the Schistosoma eggs [4]. Asymptomatic carriers present altered bladder emptying and reactive hypercontraction of the urinary bladder [10].

After several years of undiagnosed and untreated urinary symptoms the so called bilharzian uropathy occurs, with a characteristic granulomatous inflammatory response with irreversible fibrosis secondary to the immune response that takes place against the eggs placed on the walls of the urinary bladder. At this stage the most common damages are sclerosis, bladder stones, calcification and hypertrophy of bladder walls. Cytology and cystoscopy, together with imaging (ecography, computerized tomography, intravenous urography and retrograde urethrography) are important tools in identifying coexisting damage of the urinary system, like stenosis, sclerosis and granulomatous nodules at different levels. Cases of renal colic may also occur as well as pyelonephritis, pyelonephrosis, hydronephrosis, kidney stones and affectation of the urethra, seminal vesicles, prostate, vas deferens, epididymis and testicles [3, 6-8]. Female genitals are more frequently affected than the male's, mostly involving the ovaries, Fallopian tubes, the uterus and the vagina, apart from the urinary system. In countries where schistosomiasis is endemic it is considered a common cause of infertility [3]. In Africa, urethral stricture is one of the most severe complications which usually jeopardize the vital prognosis. We must also take into account the probable development of bladder squamous cell carcinoma. Over 30% of patients developing this type of cancer in endemic areas have a history of urinary schistosomiasis [3], because the parasitic eggs are highly carcinogenic [11].

Early diagnosis and treatment are essential in curing the disease and avoiding irreversible complications and sequels. The identification of parasitic eggs in the urine, semen or biopsy material is the definitive method for diagnosing active schistosomiasis. A single oral dose of 40 mg/kg of praziquantel or two different doses separated by a 12 hour interval are highly effective in exterminating parasites. After treatment is it essential to conduct thorough exploration of the genitourinary system by the urologist in hospital. In severe cases, urological controls must be periodic during some years to early prevent the appearance of bladder cancer, whose risk keeps increasing after the patient's recovery. In women, additional gynecological studies are needed [3, 7]. Recovery from the active disease is confirmed by the disappearance of viable eggs in the urine three months after the administration of praziquantel, although new therapeutic cycles may be needed to eliminate the parasitic worm. Residual unviable eggs may remain in the bladder and continue being eliminated for months, or even years [12].

The objective of this paper is to describe and discuss a case of bladder schistosomiasis identified and treated by the medical services of the Young Offenders facility of Barcelona. This is the first reported case of outpatient diagnosis and treatment of this disease before being derived to a hospital in a non-endemic country.

CLINICAL CASE

This is the case of a 20 year old patient, male, black, from Senegal who has been living in Spain for five years now. He was admitted to our facility in February 2010. In the initial medical examination it was established that the patient suffered a state of delirium of mystical content, so he was derived to psychiatry where he was diagnosed from paranoid schizophrenia. He also reported the use of cannabis. Later we underwent a general blood test, according to the prison admission protocol, which included a complete blood count (CBC), serum biochemistry and serology for hepatitis A, B, C, HIV and syphilis. The CBC revealed a value of hemoglobin of 14.2 g/dl and 300 eosinophils/ µl. The rest of analytical parameters showed no alteration. The patient initiated psychiatric treatment with risperidone, olanzapine, biperiden and quetiapine.

A few days later he consulted for pain of the glans during erection. The examination revealed that he presented a cutaneous bridge between the glans

and the penis skin in the balanopreputial sulcus, together with a short frenulum. This is why interconsultation with the urologist in our reference hospital was pursued, after which he was awaiting surgical treatment. He later consulted for a clinic of dysuria and frequent or urgent urination without a febrile syndrome or macroscopic hematuria. Empirical treatment with amoxicillin clavulanate 875/125 mg was then initiated for a 10 day period, after which the patient presented a remission of the symptoms.

Two months later, the patient was admitted to the prison's infirmary due to a psychotic decompensation. During such episode the patient consulted the clinician in charge of the unit for a new clinic of frequent and urgent urination and nocturia. A sample of urine was examined by means of a test strip revealing macroscopically normal urine with hematuria ++ and proteinuria +. This time the hematuria was evaluated in the context of the geographical origin of the patient by considering the previous episode of urinary symptoms that had remitted with antibiotics. Parasitism with *Schistosoma haematobium* was considered a first diagnostic alternative. Throughout the medical interview he reported that he had lived in his country until 15 and that as a child he used to swim in the river.

As to confirm the diagnostic suspicion a urine sample was obtained at noon after exercise [12, 13]. In our case our patient had run around the courtyard. The sample was sent to the laboratory with the indication that the diagnostic orientation was bladder schistosomiasis. The parasitic study of the urine revealed the presence of *Schistosoma haematobium* eggs, therefore confirming the diagnosis.

Conventional abdominal radiographies were taken and no bladder calcifications or other alterations were found. The patient did not present any digestive symptoms or alteration of the faeces or the bowel rhythm. Nevertheless, in view of the high probability of coexisting parasitism by *Schistosoma mansoni* due to the geographical origin, this parasite was tested in the faeces, with a negative result.

Treatment consisted of a 3g single dose of oral praziquantel, whose request was arranged by means of the pharmacy department as a foreign drug. A new urine test was requested for a date 3 months after the completion of treatment as to confirm the eradication of the eggs. A new visit to the urology service of our reference hospital was also arranged as to study potential damage of the urogenital system secondary to this disease.

DISCUSSION

African countries where this disease is endemic are among the poorer and more underdeveloped countries worldwide, with high child mortality rates, a low life expectancy and very limited healthcare and healthiness resources. In this context a high percentage of the native population becomes infected with Schistosoma during childhood and suffers urinary symptoms for years without receiving treatment. In severe manifestations, of over 20 years, some patients die due to obstructive uropathy and many due to bladder cancer. Bladder squamous cell carcinoma is the main cause of mortality by urinary schistosomiasis, especially in patients between 30 and 40 years old [12]. In our case, the lack of calcification in the x-ray examination as well as the lack of macroscopic hematuria and the short period of infection due to the patient's age, suggest a good prognosis.

Until now it is still accepted that urinary schistosomiasis is a rare disease in developed countries, but throughout recent years many publications by Spanish experts have reported new cases diagnosed in our country [3, 6-8, 12, 14, and 15]. It does not seem likely to be casual if we take into account that according to data by the Statistics National Institute the number of sub Saharan African immigrants established in Spain is about 200,000. A systematic review of the Medline database confirms that bladder schistosomiasis is becoming more common in our country and therefore it must be suspected in all urologic or mictional symptoms specifically affecting this group of patients [3, 6-8, 12]. Moreover when macroscopic or microscopic hematuria is identified, the first diagnostic suspicion must be schistosomiasis [3-8, 12].

It is hereby proven that diagnosis and treatment can be easily conducted at an outpatient level as long as the epidemiology and the clinic of the disease are considered. Hospital diagnosis and treatment entail an important delay, a delayed treatment and a less efficient management of healthcare resources.

It is also worth highlighting two different aspects. On the one hand we must note that if in a urinary parasitism the diagnostic suspicion is not reported to the laboratory and the sample is not sent in the appropriate conditions (24 hour urine, or urine at noon after exercise) the results of the sediment and the culture can be easily negative, or mistaken with urinary infection by Gram negative bacteria. Even if the eggs are large and easily recognizable if parasitism is low and hence there are few eggs there is a risk of a false diagnosis of the primary disease. On the other hand, the lack of eggs in urine does not

rule off the disease. If in our case the results of urine sediment had been negative we would have not been able to completely rule off the diagnosis since sometimes serology or bladder biopsies are needed. Once discarded, other differential diagnosis with a similar clinical presentation could be considered, especially urinary tuberculosis, kidney or urinary cancer, acute glomerulonephritis and urinary stones [12]. According to our information, the Medline reference on imported schistosomiasis in Western countries mostly comes from hospitals, almost always from the services of urology and pediatrics. In the Spanish case, a recent publication (2009) targets pediatricians reporting that we are facing a pathology more and more common in our environment and that upon clinical suspicion a thorough interview is essential to avoid more aggressive and expensive complementary examinations [6]. The last recommendation, from 2010, targets urologists: "In view of the high prevalence of urinary schistosomiasis in sub Saharan countries and its ulterior clinical and epidemiological implications, in all cases of microscopic or macroscopic hematuria in a sub Saharan immigrant it is mandatory to rule off bilharzias as the most common cause" [7].

CONCLUSION

It is worth being aware of the fact that the diagnosis and treatment of bladder schistosomiasis can be conducted by primary care services since this is where the patient is most likely to consult first. Therefore the close association between painless microscopic or macroscopic hematuria and *Schistosoma haematobium* in patients from endemic areas, mostly from sub Saharan Africa, must be taken into account. Nevertheless, although the diagnosis and treatment are feasible in the first assistance level it is highly recommended that specialized examination be conducted as to evaluate potential complications.

CORRESPONDENCE

Dr. Angel Bedoya del Campillo
Serveis Medics
Centre Penitenciari de Joves de Barcelona
Carretera Masnou Granollers, Km.13.425
08430 La Roca del Valles
abedoyac@gencat.cat

BIBLIOGRAPHICAL REFERENCE

1. Ross AG, Bartley PB, Sleigh AC, Olds GR, Li Y, Williams GM, et al. Schistosomiasis. N Engl J Med 2002; 346 (16): 1212-20.
2. Cocharan M, Almeda J, Vinuesa T Valls ME, Mejías T, Jou P, et al. Esquistosomiasis importada por viajeros españoles: estudio clínico-epidemiológico de 80 casos. Med Clin (Barc) 1997; 108: 721-5.
3. Donate MJ, Pastor H, Giménez JM, Carrión P, Segura M, Salinas AS, et al. Esquistosomiasis vesical, aportación de un caso y revisión de la literatura española. Actas Urol Esp 2006; 30: 714-9.
4. Scarlata F, Giordano S, Romano A, Marasà L, Lipani G, Infurnari L, et al. Considerazioni su un caso di schistosomiasi urinaria. Le Infezioni in Medicina 2005; 259-64.
5. Sheehan GJ, Sekla L, Harding GK. Urinary schistosomiasis: a report of four cases and a review. Can Med Assoc J 1984; 131: 1361-4.
6. Morales D, Molina J, Martínez Ortiz A, Martínez Artola V, Beristáin X. Hematuria intermitente. Esquistosomiasis vesical. A propósito de un caso. Anales Sis San Navarra 2009; 32
7. Álvarez Maestro M, Ríos González E, Domínguez García P, Vallejo Herrador J, Díez Rodríguez J, Martínez-Piñero L. Bladder schistosomiasis: case report and bibliographic review. Arch Esp Urol. 2010 Sep; 63[7]: 554-8
8. Borrell A, Queipo JA, Beltrán JF, Chocote F, Escoms F, Pastor F. Infección vesical por esquistosoma: una causa inhabitual de hematuria. Actas Urol Esp 2008; 32: 253-5.
9. Grosbusch MP, Mühlberger N, Jelinek T, Bisoffi Z, Corachán M, Harms G, et al. Imported Schistosomiasis in Europe Sentinel Surveillance Data TopNetEurop. J Travel Med 2003; 10:164-9
10. Watanabe K, Muhoho ND, Mutua WR, Kiliku FM, Awazawa T, Moji K, et al. Assessment of voiding function in inhabitants infected with Schistosoma haematobium. J Trop Pediatr 2011; 57 (4): 263-8. Publicación electrónica 28 abril 2010.
11. Abdulamir AS, Hafidh RR, Kadhim HS, Abubakar F. Tumor markers of bladder cancers: the schistosomal bladder tumors versus non-schistosomal bladder tumors. J Exp Clin Cancer Res 2009; 28: 27.
12. Juliá FX, Pepió JM. Inmigración en atención primaria. Curso autoformativo en la atención primaria de la salut. Barcelona: Institut d'estudis de la Salut. Generalitat de Cataluña; 2003; p. 51-5.

13. Bichler KH, Savatovsky I. EUA guidelines for the management of urogenital schistosomiasis. Eur Urol 2006; 49: 998-1003.
14. Navarro-Cabañas G, García-Sánchez N, Rubio-Rubio R, Izaguirre-Zugazaga C, Clavel-Parrilla A, Seral-García C. Esquistosomiasis urogenital: un diagnóstico sencillo. An Esp Pediatr 2006; 64: 282-4.
15. López-López AI, Cao-Avellaneda E, Prieto-González A, Ferri-Ñíguez B, Maluff-Torres A, Pérez-Albacete M. Esquistosomiasis: una parasitosis urinaria cada vez más frecuente. Actas Urol Esp 2007; 31: 915-8.