Hematospermia Due to Schistosome Infection in Travelers: Diagnostic and Treatment Challenges

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Hematospermia associated with schistosomal infection is a new topic of clinical interest. The features and incidence of this rare complication and the difficulties associated with its treatment have yet to be characterized. We describe 4 patients with hematospermia due to schistosome infection acquired during travel to an area of endemicity.

Schistosomiasis is one of the major communicable diseases of public health importance in the developing world. The World Health Organization estimates that 600 million people are at risk for infection, that 200 million are infected, and that 20 million of those who are infected will develop a severe illness. It has also been estimated that 20,000 deaths are associated with the disease annually [1]. Schistosoma haematobium mainly affects the urinary system, although infection of the genital organs is not infrequent among individuals in areas of endemicity [2–6]. The consequences of genital involvement, in terms of morbidity and fertility, are unclear. There is renewed interest in hematospermia as a presenting symptom of schistosomiasis in travelers returning from areas of endemicity [7, 8]. Schistosomal eggs have been found in both the prostate and the seminal vesicles of affected persons [5]. Praziquantel is the drug of choice for the treatment of most cases of schistosomiasis. However, the prostate is known to be “hostile” to many antimicrobials pharmacologically. Whether the levels of praziquantel attained in the prostate are adequate for the killing of parasites is unclear. The purpose of this report is to describe the clinical course of schistosomal hematospermia in (non-immune) travelers and to identify the diagnostic and therapeutic challenges associated with the condition.

Patients and methods. We conducted a retrospective analysis of travelers returning to Israel who complained of hematospermia that was eventually found to have been caused by schistosomal infection. Three travel clinics, located in Tel Aviv, Haifa, and Jerusalem, Israel, were contacted and asked to provide data on returning travelers with hematospermia. Diagnosis of schistosomal hematospermia was based on the presence of schistosomal eggs either in a direct smear of seminal fluid or in a prostate biopsy specimen. Urinalysis was routinely performed for all patients, and, in addition, a 24-h urine collection was concentrated to increase the likelihood of detection of schistosomal eggs. Serological testing for Schistosoma species (by Falcon assay screening test [FAST]–ELISA) and species identification (by immunoblot assay) were performed at the Laboratory for Parasitic Diseases, Centers for Disease Control and Prevention (CDC), Atlanta, Georgia. Treatment involved the use of praziquantel (Biltricide; Bayer AG).

Results. From 1997 through 1999, 70 patients with schistosomal infection were treated at the 3 aforementioned travel clinics. Four (5.7%) of these 70 patients had hematospermia. All 4 patients were travelers who were returning to Israel from Africa and who had contracted disease in Lake Malawi in Africa. Their mean age was 24.3 years (table 1), which parallels the age of the average Israeli backpacker. Onset of symptoms of hematospermia occurred 3–8 months after exposure. Two patients complained of having lower abdominal pain after ejaculation, and 1 patient had testicular hyperesthesia. In 2 patients (patients 1 and 2), gross hematuria developed before hematospermia; however, at the time of presentation, all 4 patients had negative results of urinalysis, and S. haematobium eggs were found in semen specimens from patients 1, 3, and 4 (figure 1). In addition, schistosomal eggs were found in a prostate biopsy specimen from patient 2 (figure 2). Considerable eosinophilia was found only in patient 1. Findings of ultrasonography of the prostate were normal, except for patient 2, who had slight enlargement of the prostate (table 1).

Patients 1–3 received the recommended treatment for urinary schistosomiasis, which included praziquantel, 40 mg/kg given in 2 divided doses in a single day. However, all 3 patients experienced recurrence of hematospermia with associated pain and discomfort in the genital area (table 2). A second examination of semen specimens revealed the presence of schistosomal eggs. (A viability test was not performed.) Patient 4, who
Table 1. Results of diagnostic tests used for cases of hematospermia.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age, years</th>
<th>In sperm specimen</th>
<th>In prostate biopsy specimen</th>
<th>History of hematuriaa</th>
<th>Serological testing by FAST-ELISAb</th>
<th>Rectal examination</th>
<th>Prostate ultrasound</th>
<th>Eosinophil count, % (absolute no./mm³)c</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>Positive</td>
<td>ND</td>
<td>Yes</td>
<td>Positive</td>
<td>Normal</td>
<td>Normal</td>
<td>8.8 (750)</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>ND</td>
<td>Positive</td>
<td>Yes</td>
<td>Positive</td>
<td>Mild tenderness</td>
<td>Enlarged</td>
<td>1.3 (90)</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
<td>Positive</td>
<td>ND</td>
<td>No</td>
<td>ND</td>
<td>Normal</td>
<td>Normal</td>
<td>6.0 (440)</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>Positive</td>
<td>ND</td>
<td>No</td>
<td>Positive</td>
<td>Normal</td>
<td>Normal</td>
<td>7.9 (390)</td>
</tr>
</tbody>
</table>

NOTE. FAST-ELISA, Falcon assay screening test–ELISA; ND, not done.

a None of the patients had hematuria at the time of presentation with hematospermia.
b The result was considered positive if >8 U were identified. For these 3 patients, the range was 44–53 U.
c Normal eosinophil count, <500 cells/mm³.

received an initial dose of praziquantel (60 mg/kg) that was higher than the dose given to the other 3 patients, did not experience recurrence of infection. At follow-up, which was done 1–3 years after the last course of treatment was completed, all patients were asymptomatic.

Case report. A 24-year-old male traveler with hematuria was first seen in January 1998. His medical history revealed no chronic illnesses. He had visited Tanzania, Kenya, and, finally, Lake Malawi, where he had stayed for 1 month while taking a diving course. Four months after he was exposed to *S. haematobium* infection in Lake Malawi, he noticed macroscopic hematuria (without having a history of Katayama fever after exposure). *S. haematobium* eggs were found in a urine sample. The patient was treated with praziquantel, 40 mg/kg given in 2 divided doses in a single day, and the hematuria disappeared. Three months later, he started complaining of paresthesias in both testicles; soon afterward, hematospermia was noted.

The findings of physical examination were unremarkable. Results of blood tests were within normal limits and did not demonstrate eosinophilia (absolute eosinophil count, 90 eosinophils/mm³). The findings of urinalysis were normal, but analysis of a 5-h urine collection revealed *S. haematobium* eggs. The results of serological testing for *Schistosoma* species (by FAST-ELISA), performed at the CDC, were positive. Therefore, praziquantel, 40 mg/kg administered in 2 divided doses in a single day, was given again. The hematospermia cleared but then recurred 2 months after the second treatment with praziquantel was received.

The patient was seen at a urologic clinic, where an enlarged and slightly tender prostate was identified. Transrectal ultrasonography indeed showed an enlarged prostate, and biopsy revealed the presence of *S. haematobium* eggs (figure 2).

Finally, an increased dose of praziquantel, 60 mg/kg, was given together with prednisone, 40 mg/day for 10 days (as an anti-inflammatory agent). Alleviation of the patient’s symptoms occurred within a short time, and, at follow-up, the size of his prostate had returned to normal. At follow-up 2 years later, the patient was found to be still asymptomatic (tables 1 and 2, patient 2).

Discussion Recent evidence from a field study indicates that the incidence of genital involvement in men with schistosomiasis is higher than previously was appreciated [4]. However, this presentation seems to be rare among travelers,

Figure 1. *Schistosoma haematobium* egg in semen fluid (original magnification, ×200). The egg is of ovoid shape with a length of ~150 μm and a prominent terminal spine.
with only 2 previous reports appearing in the literature [7, 8].

The recent increase in the flow of travelers to areas of endemicity should increase the number of cases of schistosomal infection seen by physicians in developed countries [9]. Thus, the clinical spectrum of the disease should be known to the medical community.

In all 4 travelers described in the present report, hematospermia presented without associated hematuria; this made the diagnosis more challenging, although hematuria had occurred several months previously in 2 of the patients. In addition, the long interval between the apparent exposure and presentation, as well as the lack of eosinophilia, added to the difficulty in reaching the correct diagnosis. This diagnostic challenge indicates that obtaining a travel history is mandatory when evaluating a patient. Exposure to freshwater in Africa should be the leading clue toward making a diagnosis. All of our patients were infected in Lake Malawi, which is a popular tourist destination and which recently was found to be severely infected mainly with *S. haematobium* [10]. All of our patients had *S. haematobium* infection, which is the main source of genital involvement. It is remarkable, however, that *Schistosoma mansoni,* which usually resides in the mesenteric vessels, has also been reported as a cause of hematospermia [7, 11].

For 1 of our patients, rectal examination revealed a mildly enlarged and tender prostate, but the prostates of the other patients appeared to be of normal size, as has been found in most other travelers with this condition [7]. This “nonfinding” may differentiate this form of prostate infection from other etiologies of prostatitis. The findings of transrectal ultrasonography were also normal for all but 1 of our patients, who had an enlarged prostate. This finding is in contrast to the findings of Corachan et al. [7], who observed either hyperechoic zones or calcification in all patients.

The cases presented in this report highlight the importance of searching for schistosomal eggs in semen specimens, because this can establish the final diagnosis. Thus, a request for sperm examination should be sent to a skilled parasitology laboratory, bearing in mind that this is not part of the routine workup either for suspected schistosomiasis or hematospermia. Although serological testing is not considered a good measure by which to distinguish between previous and current infection, in our particular study population (which can represent most travelers returning from an area of nonendemicity to an area of endemicity), it seemed satisfactory for this purpose because none of the patients previously had been exposed to freshwater in areas of endemicity. Because examination of semen may be difficult, serological testing may play an even more important role in the diagnosis of infection. The sensitivity and specificity of the FAST-ELISA and immunoblot assay performed at the CDC laboratory are 99% and 99%, respectively [10]. However, it should be noted that serological testing cannot be relied upon for evaluation of treatment failure or success, because the results of such testing remain positive for many years, even after treatment has been successful.

The recommended treatment for *S. haematobium* infection is praziquantel, 40 mg/kg given in 2 divided doses in a single day [12]. Three of the patients in our study received this treatment, and all had a clinical response within days; however, all
Table 2. Treatment protocols, recurrence of symptoms, and outcomes for 4 travelers who returned to Israel with hematospermia due to schistosome infection acquired in an area of endemicity.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Initial treatment</th>
<th>Time of recurrence*</th>
<th>Second treatment</th>
<th>Third treatment</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prz, 40 mg/kg</td>
<td>1 month</td>
<td>Prz, 40 mg/kg weekly for 3 weeks</td>
<td>Not given</td>
<td>Asymptomatic at 1 year</td>
</tr>
<tr>
<td>2</td>
<td>Prz, 40 mg/kg</td>
<td>3 months</td>
<td>Prz, 40 mg/kg</td>
<td>Prz, 60 mg/kg; Prd, 40 mg/day for 10 days</td>
<td>Asymptomatic at 2 years</td>
</tr>
<tr>
<td>3</td>
<td>Prz, 40 mg/kg</td>
<td>3 months</td>
<td>Prz, 40 mg/kg</td>
<td>Not given</td>
<td>Asymptomatic at 3 years</td>
</tr>
<tr>
<td>4</td>
<td>Prz, 60 mg/kg</td>
<td>None</td>
<td>Prz, 40 mg/kg</td>
<td>Not given</td>
<td>Asymptomatic at 1 year</td>
</tr>
</tbody>
</table>

NOTE. Prd, prednisone; Prz, praziquantel. *As measured from the time of the initial treatment.

References


