Mr. K was a 36-year-old African refugee from Somalia who immigrated to the United States from a refugee camp in Kenya. He was employed as a dishwasher with no health care benefits. Since Mr. K only had a rudimentary understanding of the English language, communication was facilitated by using a telephone translator. Mr. K was referred to a urologist at a tertiary medical center by his primary care provider (PCP) for episodic gross hematuria. Mr. K described his hematuria as intermittent, occurring 2 to 3 times per week, usually at the end of urination. He also complained of right flank pain that began several years ago after he was injured in Kenya. Prior to his visit, a renal ultrasound, urinalysis, complete blood count (CBC), and creatinine level were ordered by his PCP. His CBC and creatinine (1.0 mg/dl) were normal, and his urinalysis was negative for blood. A renal ultrasound revealed right-sided nephrolithiasis without hydronephrosis. A non-contrast computerized tomography (CT) scan of his abdomen and pelvis was normal. Upon further review, the urologist noted a thin rim of calcification in the distal right ureter and a small amount of calcification in the bladder. He believed that there could be small stone fragments in the dependent portion of the bladder. The rim of calcification in the ureter would be an unusual finding in stone disease.

At a subsequent visit one week later, Mr. K continued to complain of midline lower back pain and intermittent gross hematuria. A CT scan of the abdomen and pelvis displayed bilateral pelvicalyceal systems, bilateral renal calculi, a staghorn calculus in the right upper calyx, calcification in the bladder, and a polyp in the ileocecal valve. A diagnosis of bilateral nephrolithiasis was made. A staghorn calculus with surrounding edema was seen in the right kidney. He was discharged on praziquantel.

Schistosomiasis is a parasitic infection caused by trematodes (flat-worms). It is second only to malaria in public health significance, with an estimated 200 million people infected worldwide. Schistosoma haematobium is endemic in Africa and the Middle East. This case study discusses a 36-year-old Somali male who immigrated to a Northeastern city in the United States from a refugee camp in Kenya. He presented with episodic gross hematuria and flank pain, and was eventually diagnosed with urinary tract schistosomiasis, which was successfully treated with praziquantel. While the disease is not common in the United States, this case is presented for both its urological and cultural considerations.

Key Words: Schistosoma haematobium, urinary schistosomiasis, parasitic infection, bilharzia, praziquantel.
hematuria. A repeat urinalysis was negative for blood. To further investigate the hematuria, an intravenous pyelogram (IVP) was ordered to look for possible filling defects in the right ureter or presence of a stone. The IVP was normal. A flexible cystoscopy was also ordered to determine whether there were actually stones in his bladder versus a fact or other pathology.

The cystoscopy revealed a normal urethra; however, there were diffuse areas of granular golden sheen-like material beneath the bladder mucosa, which the urologist described as having a “corduroy appearance.” The “stone fragments” previously noted on the CT scan were actually this corduroy-like material below the bladder mucosa. This unusual finding prompted the urologist to schedule a transurethral bladder biopsy in the operating room under anesthesia. The urologist reviewed the pathology results of the bladder biopsy and consulted with various experts in pathology. Because the patient had recently emigrated from Somalia, there was suspicion of a parasitic component. The final pathology results were consistent with Schistosoma haematobium of the bladder.

The urologist consulted with the Infectious Disease team, who recommended a single two-day dose treatment with praziquantel 20 mg/kg per dose. Mr. K was then prescribed praziquantel 600 mg to be taken twice in one day to eradicate the parasitic infection in his bladder and urinary tract. The Infectious Disease team also recommended that a repeat urine sample be obtained in six months for ova and parasite analysis. If the repeat specimen was positive for schistosomiasis, the recommendation was to repeat the one-day course of the praziquantel.

Two weeks post-treatment at his follow-up appointment, Mr. K’s symptoms had improved, and he reported no further episodes of hematuria. Six months later, Mr. K’s urine was negative for Schistosoma haematobium.

Introduction and Etiology

Schistosomiasis, also known as bilharzia, is a parasitic fluke infection caused by trematodes (flatworms) from the genus Schistosoma and is second only to malaria in public health significance. Worldwide, an estimated 200 million persons are infected with schistosomiasis, and more than 600 million are at risk for the disease. About 20,000 deaths annually are related to the severe consequences of schistosomiasis (Centers for Disease Control [CDC] 1993, 2007a).

There are five primary species of schistosomiasis infecting humans: Schistosoma intercalatum, Schistosoma japonicum, Schistosoma mansoni, Schistosoma mekongi, and Schistosoma haematobium. The latter is addressed in this case study because it affects the bladder and can result in significant urinary tract consequences. The other 3 species affect the gastrointestinal tract. These diseases are mostly found in warm areas of the world. Schistosomiasis is caused by parasites which asexually reproduce in fresh water snails. When released in their final stage, these free-swimming cercaria (larvae) are attracted to human skin; they penetrate the skin, then lose their tails and migrate into the blood stream. Upon arrival in the liver, they differentiate into male and female, and S. Haematobium migrate to the bladder and lay eggs, which are excreted in the urine and hatch in fresh water to continually infect the population (see Figure 1). Schistosoma haematobium is endemic to more than 50 countries in Africa and the Middle East, and is also seen in western Asia and Latin America (Caramello 2000; Stanford University, 2004).

Risk Factors and Treatments

All persons traveling extensively in Africa or endemic Middle Eastern countries, such as Peace Corps workers and missionaries, should be advised of the risk of schistosomiasis associated with fresh water lakes, streams, and rivers throughout the continent. If contact with fresh water is unavoidable, water should be heated to 122 degrees F (50 degrees C) for five minutes or treated with iodine or chlorine. Additionally, the water can be strained with paper filters, or it can be allowed to stand for three days before use (CDC 1993, 2007c).

Medical treatment for schistosomiasis is a one or two-day course of praziquantel 20mg/kg. It is recommended that the medication be swallowed whole with food due to its bitter taste. It is usually well-tolerated; however, side effects include dizziness, headache, abdominal cramps, transient nausea, malaise, and diarrhea. It is not recommended to be used by women who are breast feeding. Prevention of schistosomiasis in endemic areas includes drainage of marsh areas where snails breed, improved sanitation, education of at-risk populations about the use of molluscicides, and introduction of bio-control agents (CDC 2007b).

Clinical and Nursing Implications

The authors’ northeastern U.S. city of 250,000 is experiencing an influx of people with refugee status. It is a refugee resettlement city with increasingly diverse cultural groups relocating to the area. When these refugees

Signs and Symptoms

In the early stages of the infection, most people have no symptoms. After the parasite penetrates the skin of the human host, a rash or itch may develop on the skin within a few days. Fever, chills, cough, and muscle aches are possible 1 to 2 months post-infection. People initially infected with S. Haematobium often experience hematuria, but chronic disease can lead to persistent cystitis, pyelonephritis, obstructive renal disease, and an increased incidence of bladder cancer. Schistosomiasis can result in severe morbidity and mortality (CDC 1993, 2007c).
Figure 1.
Schistosomiasis

Causal Agents:
Schistosomiasis is caused by digenetic blood trematodes. The three main species infecting humans are Schistosoma haematobium, S. japonicum, and S. mansoni. Two other species, more localized geographically, are S. mekongi and S. intercalatum. In addition, other species of schistosomes, which parasitize birds and mammals, can cause cercarial dermatitis in humans.

Life Cycle:
Eggs are eliminated with feces or urine 1. Under optimal conditions the eggs hatch and release miracidia 2, which swim and penetrate specific snail intermediate hosts 3. The stages in the snail include 2 generations of sporocysts 4 and the production of cercariae 5. Upon release from the snail, the infective cercariae swim, penetrate the skin of the human host 6, and shed their forked tail, becoming schistosomulae 7. The schistosomulae migrate through several tissues and stages to their residence in the veins 8. Adult worms in humans reside in the mesenteric veins in various locations, which at times seem to be specific for each species 9. For instance, S. japonicum is more frequently found in the superior mesenteric veins draining the small intestine 10, and S. mansoni occurs more often in the superior mesenteric veins draining the large intestine 11. However, both species can occupy either location, and they are capable of moving between sites, so it is not possible to state unequivocally that one species only occurs in one location. S. haematobium most often occurs in the venous plexus of bladder C, but it can also be found in the rectal veins. The females (size 7 to 20 mm; males slightly smaller) deposit eggs in the small vessels of the portal and perivesical systems. The eggs are moved progressively toward the lumen of the intestine (S. mansoni and S. japonicum) and of the bladder and ureters (S. haematobium), and are eliminated with feces or urine, respectively 12. Pathology of S. mansoni and S. japonicum schistosomiasis includes: Katayama fever, hepatic perisinusoidal egg granulomas, Symmers’ pipe stem periportal fibrosis, portal hypertension, and occasional embolic egg granulomas in brain or spinal cord. Pathology of S. haematobium schistosomiasis includes: hematuria, scarring, calcification, squamous cell carcinoma, and occasional embolic egg granulomas in brain or spinal cord.

Human contact with water is thus necessary for infection by schistosomes. Various animals, such as dogs, cats, rodents, pigs, hourse and goats, serve as reservoirs for S. japonicum, and dogs for S. mekongi.

Geographic Distribution:
Schistosoma mansoni is found in parts of South America and the Caribbean, Africa, and the Middle East; S. haematobium in Africa and the Middle East; and S. japonicum in the Far East. Schistosoma mekongi and S. intercalatum are found locally in Southeast Asia and central West Africa, respectively.

Source: CDC, 2007b.
immigrate, they can bring with them exotic diseases unusual for a cold climate.

The need for effective communication between patient and health care provider is essential. In a diverse population, breaking the language barrier is imperative in obtaining an accurate history, examination, diagnostic work-up, effective treatment, and compliance with follow up.

Nurses play an essential role in meeting the diverse communication needs of the non-English-speaking population by acting as liaisons with interpreters. In Mr. K’s situation, the authors utilized an interpreter who spoke both English and Mr. K’s native language. A telephone interpreter service was used at each visit, greatly enhancing communication with Mr. K. Limitations may include inability to translate medical terminology. It is especially important that the nursing staff be able to use lay terminology to describe medical terms. Nurses reinforced the importance of keeping the 6-month follow-up visit to confirm eradication of the parasite, and educated the patient about the disease and the need to return at once if any recurrence of gross hematuria occurred.

Social/Economic Barriers

Mr. K did not have health insurance and lacked financial resources to pay for his medical treatment or his medication. The urologist elected to pay for the medication ($72.00) himself. He also had transportation problems. Social Services at the hospital was contacted to assist the patient with other needs, such as financial counseling and transportation for follow-up visits.

Conclusion

In this case, accurate diagnosis and effective treatment resulted in a positive outcome. First-hand understanding of a relatively rare disease process in the United States that is endemic to many other parts of the world was gained. Just two doses of an oral antiparasitic medication eradicated a potentially life-threatening infection; however, without financial assistance, the patient’s lack of resources could have prevented him from receiving appropriate diagnostic testing and purchasing the necessary treatment.

Effective communication is essential to break the language barrier. Interpreter services were available by telephone and facilitated successful communication. As health care providers, nurses must look beyond the obvious and consider cultural factors, such as patient’s country of origin and current living conditions, to help determine the possible etiology of symptoms and disease. [■]

References


