What's Eating You? *Schistosoma haematobium*

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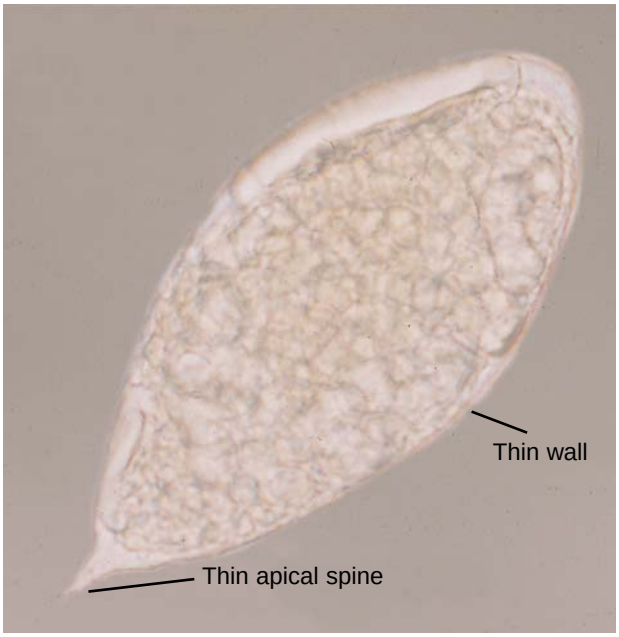
Ova of *Schistosoma haematobium* are oval with a thin refractile wall and a delicate apical spine (Figure). In contrast, ova of *Schistosoma mansoni* have a thick refractile wall and a thick lateral spine. Ova of *Schistosoma japonicum* have a thick refractile wall and are smaller and rounder than those of *S haematobium*. *S japonicum* usually shows no visible spine, though some specimens will demonstrate an inconspicuous apical spine.

Travelers who swim in freshwater in endemic areas are at risk for acquiring schistosomiasis. Researchers followed up with 29 travelers returning from Mali who had been swimming in freshwater pools. Twenty-eight of the 29 became infected. One third of those infected presented with cercarial dermatitis, and about one half developed Katayama fever. Ova were recovered in stool (*S mansoni* and *Schistosoma intercalatum)* or urine (*S haematobium)* in 22 of the 28 patients. Ten patients had mixed infection with more than one species.[1] A study in Zimbabwe suggested that there can be substantial attrition of invading cercaria. In this study of 48 children with more than one contact with infective water every 3 days, the authors estimated that 1 in 100 contacts resulted in infection.[2] A study of 2136 residents of a community in Nigeria with a 50% prevalence of infection suggests that the number of water contacts is more important than the duration of exposure.[3]

A study of endemic infection with schistosomes in rural populations in Liberia found that most symptoms of infection were related to *S haematobium* rather than to *S mansoni*. Hematuria and dysuria were the most frequent signs of infection. Bladder calcifications were present in 10% of those studied. Schistosomal ova counts ranged from 1 to 6200 per 10 cc of urine for *S haematobium* and 1 to 228/g of stool for *S mansoni*.[4] Ultrasound examination for bladder involvement has been used to identify communities at risk. Recently developed tools for assessing the prevalence of infection include assays for *S haematobium* antigens and eosinophilic cationic protein in urine. These markers are useful in assessing response to therapy.[5] In endemic areas of Upper Egypt, the prevalence of *S haematobium* infection averages 7.8%.[6] Exposure to canal water remains a major risk factor. In Lower Egypt, *S mansoni* has almost totally replaced *S haematobium*.[6]



Ovum of *Schistosoma haematobium*.

Physicians in the United States and Europe must consider schistosomiasis in children with hematuria who have traveled to endemic areas.[7] Skin lesions may be the sole manifestation of schistosomiasis and may present years after exposure.[8]

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Skin involvement is often noted in anogenital sites. The lesions may be nodular or may resemble condylomata accuminata. In addition, they may present as a subtle, pruritic papular rash in the perineum.[9] The diagnosis of cutaneous schistosomiasis often is based on histopathologic findings in a skin biopsy specimen. Skin lesions typically contain schistosome ova, characterized by a refractile chitinous wall and central basophilic stippling.

Treatment with single-dose praziquantel is typically successful in treating infestations with *S haematobium*. Three doses of metrifonate given at 2-week intervals also can be effective, but in indigenous populations, the rate of reinfection may be high, despite effective treatment with either drug.[10]

Understanding of the disease is poor in many rural endemic areas. Some local populations regard hematuria as a sign of manhood, while others attribute the red color of urine to a variety of sugar cane eaten in the area. Community education is a necessary part of control efforts.[11] Research involving the development of effective vaccines holds the greatest promise for preventing disease in indigenous populations. Agents to control the intermediate hosts (freshwater snails) also may be important. Populations of *Bulinus truncatus*, the intermediate host snail of *S haematobium*, are dependent on algal growth. Simply covering irrigation siphon boxes to reduce algal growth can effectively and selectively decrease the population of the intermediate host snail. Plant molluscicides, such as *Jatropha curcas* L. (Euphorbiaceae), show promise as affordable agents for the control of snail populations.[12] In 1994, the Moroccan Ministry of Health initiated a control program designed to eliminate schistosomiasis from Morocco by the year 2004. By 1997, this objective had been achieved in 3 of the 20 provinces affected.[13]

For travelers to endemic areas, topical agents to prevent penetration of schistosome cercariae represent a practical approach to the control of the disease. Schistosome cercariae secrete a serine protease, which facilitates penetration of human skin. Topical preparations of serine protease inhibitors have shown potential as topical schistosome antipenetrant agents.[14] *S mansoni* commonly is used to study the efficacy of antipenetrant agents. Topical insect repellents show promise as antipenetrant agents. N,N-diethyl-*m*-toluamide (DEET), also known as *N,N-diethyl-3-methylbenzamide*, incorporated into liposomes shows a potent antiparasitic effect against *S mansoni*.[15] Another insect repellent, 1-(3-cyclohexen-1-yl-carbonyl)-2-methylpiperidine (AI3-37220), also shows promise as a topical antipenetrant agent to prevent infection with *S mansoni*.[16] Further studies are needed to show effectiveness against other schistosomes.

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