

Mini Review

Global Health: Urogenital Schistosomiasis in the Adolescent Girl

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A B S T R A C T

Urogenital schistosomiasis affects millions of women in sub-Saharan Africa. Infection by the causative organism, *Schistosoma haematobium*, commonly occurs during childhood and adolescence and can lead to anemia from hematuria, inflammation on the cervix which can increase risk of HIV transmission, and pelvic infection leading to infertility. Fortunately treatment is not costly, but early diagnosis is important to reduce long-term morbidity. Our objective is to review the epidemiology, pathophysiology, and diagnosis of urogenital schistosomiasis as well as treatment to improve the reproductive health of girls where this infection is endemic.

Key Words: Urogenital schistosomiasis, Reproductive tract infections, Neglected diseases

Introduction

In the last decade, the global health community has begun to address the tremendous reproductive health issues confronting young women, including female genital mutilation and obstetric fistulae from birth trauma. Less visible but equally serious and prevalent is the reproductive pathology caused by helminths in developing countries such as Africa and areas of South America. Schistosomiasis is a chronic, parasitic disease caused by blood flukes affecting more than 200 million people worldwide, at least 90% of who live in sub-Saharan Africa.¹ *Schistosoma haematobium* is prevalent in Africa and the Middle East and affects both the urinary and genital tracts in up to 75% of infected individuals.^{2,3} Over 400 million people are estimated to be at risk of *S. haematobium* infection.⁴ *S. haematobium* infection in women causes female genital schistosomiasis (FGS), which is defined as the presence of schistosome eggs and worms in the upper and lower genital tracts or by a characteristic clinical pathology.^{3,5} We review the impact of female genital schistosomiasis caused by *S. haematobium* on the reproductive health of young women in Africa.

Epidemiology, Prevalence, and Risk Factors

Schistosomiasis is found in both tropical and sub-tropical areas of the world. There are 6 major species in the genus *Schistosoma* that are known to contribute significantly to disease morbidity: *S. mansoni*, *S. japonicum*, *S. mekongi*, *S. guineensis*, *S. intercalatum*, and *S. haematobium*; two-

thirds of schistosomiasis cases are caused by exposure to *S. haematobium*, 1 of the 2 main schistosome species that are endemic in Africa.^{1,6} Fig. 1 displays the geographical distribution of *S. haematobium* infection. Infection occurs when humans bathe or swim in water infected with the larva or cercariae of the schistosomiasis parasite, which is released into the water by freshwater snails.

Disease prevalence is high in sub-Saharan Africa where approximately 76% of the population lives near rivers, lakes, and other bodies of water contaminated with the snail intermediate hosts.⁷ Infection occurs in the context of agricultural, domestic, and recreational activities that expose people to infected sources of water. As a result, women who perform domestic activities such as soaking laundry in the river water and adolescents who bathe or swim in the water are more susceptible to infection with the water-borne fluke.

The highest prevalence and intensities of human schistosomiasis occur in school-aged children, adolescents, and young adults.⁷⁻⁹ Infection peaks between ages 5-15 years. Young girls are more likely to engage in water activities which make them more susceptible to infection with the water borne fluke.¹⁰ Approximately 33%-75% of infected women in areas of sub-Saharan Africa endemic for *S. haematobium* also suffer from female genital schistosomiasis (FGS).³ The high prevalence of urogenital schistosomiasis among young women may be a result of the changes in pelvic vasculature that occur during puberty when anastomoses between the different venous plexuses of the small pelvis are formed. These anastomoses allow for the migration of adult worms and/or embolization of eggs in the female genital region.^{3,11} In a cross-sectional study of children in South Africa, one-third of girls reported having genital symptoms related to schistosomiasis, such as bloody discharge, genital ulcer, and dysuria.¹² Although relatively uncommon in the United States, physicians who care for refugees from Africa should be aware of urogenital

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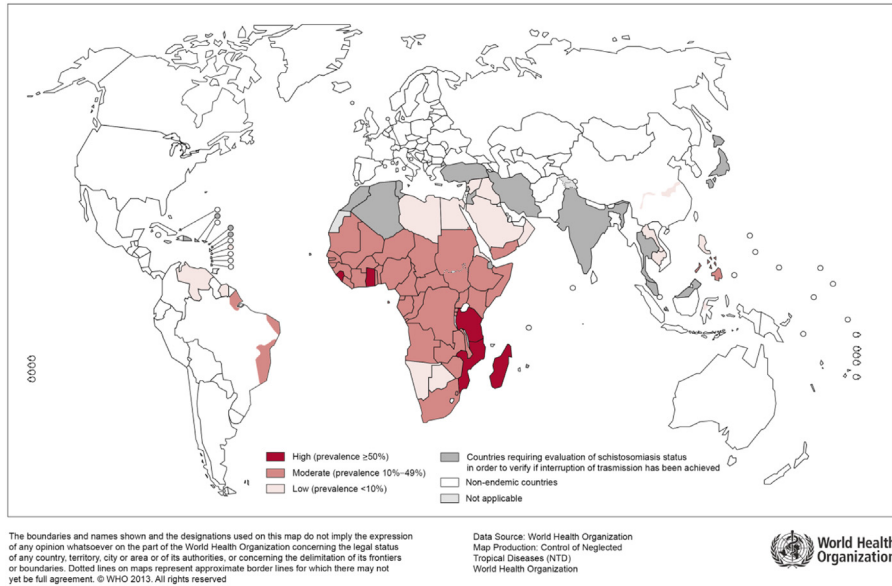


Fig. 1. Distribution of schistosomiasis worldwide, 2012. http://gamapserver.who.int/mapLibrary/Files/Maps/Schistosomiasis_2012.png. Reprinted with permission from the WHO.

schistosomiasis in the differential diagnosis of these symptoms. From 2004 to 2013, over 757,000 individuals from Sub-Saharan Africa sought permanent legal status in the United States, with the majority settling in California, Georgia, Maryland, Massachusetts, Minnesota, New Jersey, New York, Texas, and Virginia.¹³

Pathophysiology

According to Ross et al, *S. haematobium* is the most common species of the Schistosoma genus to invade the urogenital tract.¹⁴ Snail larvae present in contaminated water

penetrate human skin; once inside their human hosts, the cercariae travel through the systemic circulation to reach the portal veins where they develop into adult worms. Injury is caused by parasite eggs, which are deposited by adult worms in the blood vessels surrounding the bladder.^{7,15} Once in the pelvis, invasion of the genital tract can occur via direct extension through pelvic organs or through the blood vessel anastomoses.^{5,16,17} Both the upper and lower female reproductive tracts can be affected by the deposition of schistosoma eggs that cause immune reactions and damage to organs. *S. haematobium* commonly invades the cervix and lays eggs at the ecto-endocervical junction (Fig. 2).¹⁸ The

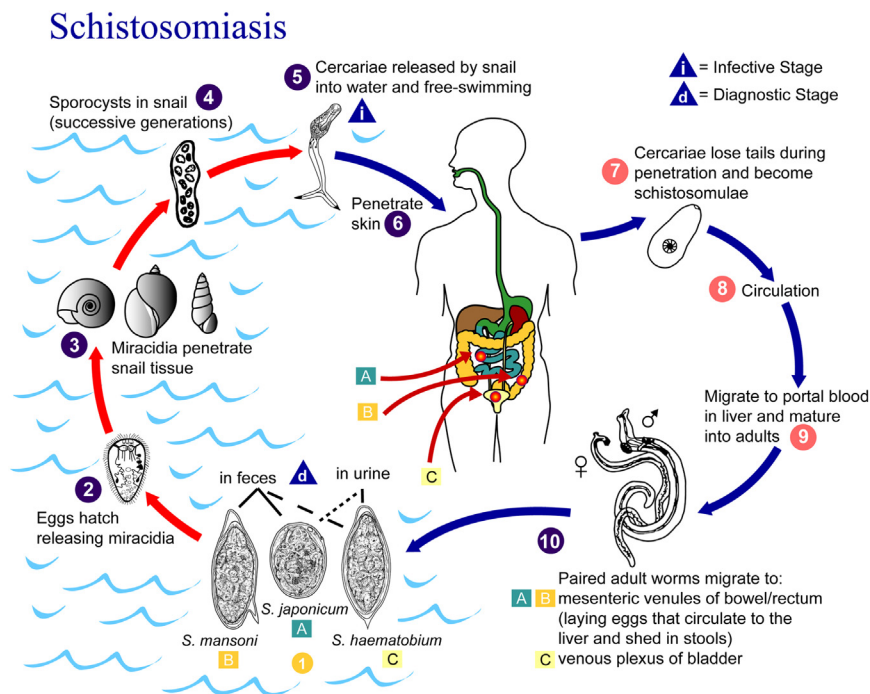


Fig. 2. The disease transmission cycle for schistosomiasis. <http://www.cdc.gov/dpdx/schistosomiasis/index.html>. Content provided by CDC/Alexander da Silva/Melanie Moser through the Public Health Image Library. Public domain.

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