

# Schistosomiasis (Bilharzia)

## Frequently Asked Questions

### 1. What is schistosomiasis?

Schistosomiasis, also known as bilharzia, is a disease caused by parasitic worms that require two hosts: humans and certain species of snails. There are two forms of the disease, namely, intestinal schistosomiasis, caused by *Schistosoma mansoni* and *S. japonicum*, and urogenital schistosomiasis, caused by *S. haematobium*. There are less common schistosome species in some parts of the world, e.g. *S. mekongi* and *S. intercalatum*.

Schistosomiasis is a neglected tropical disease (NTD) endemic in 70 developing countries, with more than 200 million people infected worldwide. An estimated 90% of people requiring treatment for schistosomiasis live in the African region. Schistosomiasis is the second most socioeconomically devastating parasitic disease after malaria.

### 2. Who can get schistosomiasis?

People at risk of infection are those living in or traveling to areas where schistosomiasis is endemic and whose skin comes into contact with fresh water that is home to the snail host of the parasite.

### 3. Where does schistosomiasis occur in South Africa?

Schistosomiasis is a major neglected public health problem in South Africa. There are about four million people at risk, mainly children. The prevalence in children in some places is up to 95%, but the total number of infected people is unknown. It is mainly found in Limpopo and Mpumalanga Provinces; the north and east of Gauteng Province; the lower-altitude areas of KwaZulu-Natal Province and extending along the coast into the Eastern Cape Province to around Gqeberha. All the countries neighbouring South Africa, except Lesotho, have transmission areas.

### 4. How is schistosomiasis transmitted?

Schistosomiasis is transmitted by contact with contaminated fresh water (lakes, ponds, rivers, dams) inhabited by certain types of snails carrying the parasite. Swimming, bathing, fishing and even domestic chores such as laundry and herding livestock can put people at risk of contracting the disease. Infected snails produce tiny swimming forms of the parasite called cercariae. Cercariae emerge from the snails and swim in the water; if they come into contact with human skin, they attach and penetrate. Once inside the body, the parasites develop into male and female worms that pair up and live together in the blood vessels of the urogenital organs (*S. haematobium*) or large intestine (*S. mansoni*) for years. In the tissues of these organs, female worms release thousands of eggs that are passed out of the body in the urine and faeces. If infected urine or faeces contaminates bodies of fresh water, the eggs hatch, releasing the parasite stage that seeks out and infects snails, and the cycle begins again. Many schistosome eggs remain in the body, and cause inflammation and damage in organs such as the bladder, female reproductive system, intestine, liver, spleen, lungs, and sometimes, the brain and the spinal cord.

## 5. What are the signs and symptoms of schistosomiasis in humans?

Infection may be asymptomatic or mild. The incubation period range is 14–84 days for acute schistosomiasis. Chronic infection can remain asymptomatic for years. Penetration of the skin by cercariae can be associated with a tingling sensation and rash ('swimmer's itch') that develops shortly after contact with contaminated water. Acute schistosomiasis, occurring two weeks to two months after exposure, is characterized by fever (Katayama fever), headache, myalgia, diarrhoea and respiratory symptoms. It does not always occur.

The clinical manifestations of chronic schistosomiasis are the result of host immune responses to schistosome eggs in specific organs. *S. mansoni* and *S. japonicum* eggs in the intestine may cause abdominal pain, diarrhoea, and blood in the stools. *S. haematobium* infection in the urinary tract typically causes dysuria and haematuria in both genders. Urogenital schistosomiasis is also associated with increased risk of HIV transmission and acquisition, kidney damage and bladder cancer. Female genital schistosomiasis (FGS) occurs when *S. haematobium* infection causes damage to the reproductive tracts of young girls and women. Symptoms include vaginal discharge and bleeding. Infertility and risk of ectopic pregnancy are other consequences. Other manifestations of schistosomiasis may include seizures or paralysis (involvement of the brain/spinal cord), enlargement of the liver or spleen, and complications from damage to the liver and lungs. Children with repeated infections can develop anaemia, malnutrition and learning difficulties.

## 6. How is schistosomiasis diagnosed?

Diagnosis is made by microscopic identification of parasite eggs in stool (*S. mansoni* or *S. japonicum*) or urine (*S. haematobium*). However, eggs are often not found in early and/or light infections; they appear 5 to 15 weeks after exposure. Serologic tests are useful to diagnose early or light infections in travellers and in others who have not had schistosomiasis previously, where egg shedding may not be consistent. Antibody tests do not necessarily distinguish between past and current infection. Test sensitivities and specificities vary, depending on the antigen preparation used and how the test is performed. Rapid antigen tests that indicate active infection are available in some laboratories. Health care providers should consider screening asymptomatic people who may have been exposed during travel and who may benefit from treatment.

## 7. How is schistosomiasis treated?

The treatment for schistosomiasis in South Africa is praziquantel. It is effective against all species of schistosomes. The usual dose is 40 mg/kg as a single dose or 2 divided doses, 4 to 6 hours apart. For heavy infections with *S. mansoni*, a higher dose may be necessary and a regimen of 30 mg/kg on two successive days (total dose, 60 mg/kg) has been recommended. The side effects of praziquantel are usually mild; commonly, malaise, nausea, abdominal discomfort, headache, drowsiness, dizziness; less common are urticaria or arthralgia. Praziquantel is much less active against immature worms as compared to the adults; therefore, single-dose treatment early in infection is only 60% to 90% effective and a proportion of patients will require re-treatment. It is not effective as pre- or post-exposure prophylaxis. Involvement of the brain and spinal cord should be treated early if reasonably suspected, even if not proven, because of potentially devastating sequelae. In this situation adjunctive steroid treatment, e.g. dexamethasone, is generally recommended.

## 8. How can schistosomiasis be prevented?

No vaccine is available. No drugs for preventing infection are available. Preventive measures are primarily avoiding wading, swimming, or other contact with fresh water in disease-endemic areas. Untreated piped water coming directly from freshwater sources may contain cercariae, but adequate filtering with fine-mesh filters, boiling bathing water, or allowing water to stand for  $\geq 24$  hours before use can eliminate the risk of infection.

Swimming in adequately chlorinated swimming pools is virtually always safe, even in disease-endemic countries. Vigorous towel-drying after accidental exposure to water has been suggested as a way to remove cercariae before they can penetrate, but this may only prevent some infections and should not be relied on. Topical applications of insect repellents such as DEET can block penetrating cercariae, but the effect depends on the repellent formulation, may be short-lived, and cannot reliably prevent infection.

### **9. Schistosomiasis is a notifiable medical condition (NMC). What does this mean?**

Disease surveillance for schistosomiasis in South Africa is passive and relies on disease notifications. In 2017, it was classified as a category 2 notifiable medical condition (NMC). Category 2 NMCs are required to be notified to the Department of Health, in writing or electronically, within seven days of diagnosis by a health care provider as well as by all diagnostic laboratories.

### **10. Where can I find out more information**

- Contact the NICD's Outbreak Response Unit or the Centre for Emerging Zoonotic and Parasitic Diseases.
- Urgent medical/clinical-related queries (healthcare professionals only): NICD Hotline +27 800212552
- For more information on NMC: <https://www.nicd.ac.za/nmc-overview/overview/>