Schistosomiasis (bilharzia): FAQs

What is schistosomiasis and how do you get it?

Schistosomiasis is a disease caused by parasitic worms (flukes) that live in the blood vessels of the bladder and large intestine of humans. The flukes usually live for 4 to 7 years. There are 2 forms of the disease: urinary schistosomiasis, caused by *Schistosoma haematobium*, and intestinal schistosomiasis, caused by *S. mansoni*. You get the infection by swimming or wading in water that has the infective cercarial stage in it. The cercariae are released from infected water snails belonging to the genera *Bulinus* and *Biomphalaria* (the intermediate hosts). The snails become infected from humans with schistosomiasis who have contaminated soil and water with urine and faeces containing eggs; these hatch in contact with water and release a stage which targets the snails.

How much schistosomiasis is there in South Africa and where does it occur?

Schistosomiasis is a major neglected public health problem in South Africa; there are about 4 million people, mainly children, at risk. In some places there are prevalences in children of up to 95%, but the total number of infected people is not known. Conditions suitable for the intermediate snail hosts are mainly north and east of the Witwatersrand in Gauteng, Limpopo and Mpumalanga Provinces; the lower-altitude areas of KwaZulu-Natal Province; and extending along the coast into the Western Cape Province to around Port Elizabeth. Apart from a few known foci, the Vaal/Orange river system is not affected. All neighbouring countries are affected, except Lesotho.

What are the signs and symptoms of schistosomiasis?

The female flukes lay eggs that cause inflammatory damage to internal organs – mainly lower colon and rectum, bladder and liver, but also sometimes the lungs, reproductive organs, and occasionally the brain and spinal cord. The amount of tissue damage is related to the fluke and egg burden in an individual. In persons living in endemic areas and exposed at an early age, or others only lightly exposed,
infection may be asymptomatic or only mildly so, unless complications occur later in life. Visitors exposed to heavy infections for the first time are more likely to get an itchy skin rash followed a few weeks later by an acute, sometimes severe, febrile illness called Katayama fever. These persons are also at risk for central nervous system schistosomiasis. Chronic schistosomiasis, together with other helminth parasite infections, contributes significantly to long-term ill health, nutritional and growth deficiencies, and poor school performance in rural schoolchildren. Typhoid fever relapses (which tend to be mild) are associated with chronic schistosomiasis co-infection. Long-term sequelae of schistosomiasis include obstructive renal disease, bladder cancer, tubal infertility, hepatic fibrosis, cor pulmonale, and portal hypertension and its complications.

**How is schistosomiasis diagnosed?**

In a previously unexposed person, there is usually an early (3 to 6 weeks post-exposure) eosinophilia, followed by the appearance of antibodies (around 4 weeks); finally eggs appear 5 to 15 weeks after exposure. The ‘first prize’ in the diagnosis of schistosomiasis is finding eggs in urine, faeces or in tissue biopsies by microscopy. Maximum egg excretion occurs from late morning to early afternoon. In *S. haematobium* infections the terminal urine portion will yield most eggs; ideally, the entire urine specimen should be collected for concentration in the laboratory (e.g. by filtration or sedimentation). Examination of rectal mucosal snips is more sensitive than faeces examination. Serological tests (for IgM, IgE, IgA, IgG) can be useful if eggs are not found. Infection acquired at an early age (e.g. by rural children) is often silent or minimally symptomatic (most commonly, haematuria), especially if the egg burden is low; however, direct questioning will often elicit symptoms of dysuria and malaise. In these cases, serology is of little or no use and microscopic examination of urine or stool for eggs is required. A positive dipstick test for haematuria is a practical indicator of urinary schistosomiasis in an endemic setting. Serology is also not useful in monitoring response to treatment, as antibodies can persist at low levels for months or years. Antigen detection assays, able to demonstrate active infection, have now reached the stage of commercialisation, and a rapid lateral flow immunochromatographic product for schistosomiasis is on the market (Rapid Medical Diagnostics, Pretoria). Several evaluation studies have been published. Performance
on detecting *S. mansoni* infections is generally good in comparison to microscopy, but sensitivity in genitourinary schistosomiasis is only around 40%. Better sensitivities for *S. haematobium* have been found with similar assays still under investigation. Radiographic techniques (sonography, contrast studies) are useful to assess the late complications of schistosomiasis; CT or MRI is indicated for suspected cord or brain involvement.

**Does immunity to schistosomiasis occur?**

In endemic areas, there is a build-up of infection during childhood and adolescence, often followed by a steady reduction in the parasite burden as measured by the number of eggs excreted (independent of water exposure i.e. acquired immunity). Because of the possibility of long-term complications, symptomatic infections should always be treated in all age groups.

**How is schistosomiasis treated?**

The treatment for schistosomiasis in South Africa is praziquantel (‘Biltricide’, Bayer; Essential Drug List). It is effective against both 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, eosinophilia, or arthralgia. Praziquantel is much less active against immature flukes 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, for the same reason. Involvement of the CNS 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. Laminectomy may be required in acute paraplegia with spinal compression.

**How do you know you are cured of schistosomiasis?**
Eggs continue to be excreted for a while even after successful treatment, so their presence does not necessarily indicate treatment failure; a laboratory report on the viability of eggs is required to assess response to treatment. Serology should not be used to monitor response to treatment, for reasons mentioned above. An otherwise-unexplained eosinophilia is an indication of possible continued infection.

**What methods are used for control of schistosomiasis?**

The control of schistosomiasis is multifaceted, with environmental, sanitation, clinical and community health aspects. Ideally, chemotherapy should be just one of the tools in such multi-targeted control programmes, which are unfortunately rarely fully implemented. For wider public health benefit mass chemotherapy for schistosomiasis may usefully be combined with single-dose therapy for intestinal helminths (e.g. albendazole) when school-age children are the target group.

**Which schistosomiasis cases should be referred to hospital?**

Patients with schistosomiasis (which may only be suspected, in early stages of infection) should be referred for secondary or tertiary care if they present with severe, acute disease (Katayama syndrome); clinical evidence of acute spinal compression or transverse myelitis (this should be regarded as a neurological emergency); or long-term complications that require specialist attention (portal hypertension, cor pulmonale, obstructive uropathy, etc).

**Reference**