THE PATHCARE NEWS

SCHISTOSOMIASIS/BILHARZIA

Schistosomiasis (Bilharzia) is an intravascular parasitic infection caused by flukes (trematodes) of the genus Schistosoma. Both *S. haematobium* and *S. mansoni* are endemic in South Africa in Limpopo, Mpumalanga, northern and eastern parts of Gauteng provinces and the lower-altitude and coastal regions of KwaZulu-Natal extending into the Eastern Cape. In Namibia, the disease is endemic in the northern regions of the country, especially in the Kavango and Omusati regions.

Schistosomiasis is transmitted to humans by contact with fresh water contaminated with the infective form of *Schistosoma species* known as cercariae. The cercariae penetrate through intact skin and migrate to the liver via the lymphatic system and the lungs, where they develop into adult worms. *S. haematobium* adult worms migrate to the venous plexus surrounding the bladder and cause urogenital schistosomiasis, whereas *S. mansoni* adult worms migrate to the mesenteric venous plexus surrounding the intestine and cause intestinal schistosomiasis. The adult worms reproduce in these venous plexuses, where the female lays eggs which penetrate though the mucosal wall of the bladder or intestine and are excreted in urine or stool. Occasionally the eggs travel back up the portal venous system to the liver or other parts of the body such as the spinal cord and brain.

SIGNS AND SYMPTOMS:

Penetration of the cercariae through the skin may cause a rash referred to as "swimmers itch", which develops a few hours after infection up to a week after exposure. Acute schistosomiasis (Katayama fever) occurs in some people approximately 3-6 weeks after exposure, and is characterized by fever, headache, myalgia, diarrhea, respiratory symptoms, and eosinophilia on peripheral blood. Many people with low intensity infections may be asymptomatic. The signs and symptoms of chronic schistosomiasis include hematuria, dysuria (urogenital form) and diarrhea, bloody stools, liver and/or splenic enlargement and portal hypertension (intestinal form).

LABORATORY TESTING FOR DIAGNOSIS:

Due to the various stages and variability in the intensity of infections, various testing modalities along with a history of exposure and suggestive clinical signs and symptoms are used together to diagnose schistosomiasis. Eosinophilia in a patient with symptoms and history of exposure is suggestive of schistosomiasis and should prompt further diagnostic testing. Haematuria is suggestive of urogenital schistosomiasis and should prompt further diagnostic testing.

1. Microscopy:

Microscopy to detect eggs in urine *(S. haematobium)*, faeces *(S. mansoni)* or on bladder/colon biopsy is the gold standard method for diagnosis of active schistosomiasis. Sensitivity is low, especially in low intensity and early or late chronic infections. Ideally, urine should be collected between 12:00-15:00 to improve the diagnostic yield.

Request: Urine Bilharzia microscopy **MUMIC; Sample type:** Urine collected between 12:00-15:00

2. Antibody testing:

Serology is most useful for travelers with symptoms returning from endemic areas. Antibodies may be detected from 6-8 weeks after exposure. Bilharzia IgM positivity suggests recent infection and IgG positivity suggests recent or past infection. False positivity, especially IgM, may occur as result of exposure to animal schistosomes or other soil helminths.

Request: Bilharzia Antibody (Ab) **SBIL** (T1173); **Sample type:** Blood collected in SST Gel Tube

3. Antigen testing:

The presence of CCA (circulation cathodic antigen) in the urine, or CAA (circulating anodic antigen) in serum indicate the presence of established active infection. These antigens may be detected before the adult worms have started to produce eggs. The urine CCA test can detect antigens of all S*chistosoma species*, but it has a higher sensitivity for *S. mansoni* infections. It can be used to detect antigens in medium to high intensity infections with *S. haematobium.* The serum CAA test detects antigens of all the *Schistosoma species.*

Request: Bilharzia Serum CAA: **SBILCAA** (X3368); **Sample type:** Blood in SST Gel Tube

Bilharzia Urine CCA: **MUBILCCA** (L3446); **Sample type:** Urine

4. Molecular Testing:

Real-time polymerase chain reaction (PCR) tests are both sensitive and specific for *S. haematobium, S intercalatum and S. mansoni.* It demonstrates higher sensitivity than microscopy, especially in early disease and in low-intensity infections. An advantage of PCR testing is that collection of the urine sample is not affected by the day-to-day variation and the circadian rhythm of egg excretion by the *Schistosoma species* adult worms.

Request: PCR Bilharzia **PMSCHBILH** (X5875); **Sample type:** Urine

TREATMENT:

Praziquantel is active against mature adult worms. Therapeutic failure may occur in the early stages of infection before adult worm maturation, which occurs 8-12 weeks after exposure. Patients with microscopic evidence of infection should be re-evaluated after 4 weeks to demonstrate clearance of the eggs. The CCA and CAA antigen tests may be used to monitor treatment response and becomes negative approximately 2-3 weeks after successful treatment.

References are available on request.

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