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AMPATH LAB UPDATE

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Laboratory diagnosis and monitoring of schistosomiasis in South Africa

The laboratory diagnosis of schistosomiasis is challenging and particularly difficult in the setting of early and low-grade infections. This update serves to provide an overview of the diagnostic process.

Epidemiology

- **Exposure to warm, slow-moving fresh water masses:** e.g. through swimming, fishing or performing laundry activities.
- **Aquatic intermediate host needs to be present:** for *Schistosoma haematobium* it is the *Bulinus* species and for *S. mansoni* it is the *Biomphalaria* species of snails.
- **Endemic areas in South Africa:** Limpopo and Mpumalanga, the northern and eastern parts of Gauteng, coastal and lower-altitude regions of KwaZulu-Natal, extending into the Eastern Cape as far south as Gqeberha (formerly Port Elizabeth).

A suggested approach to the diagnosis of schistosomiasis in asymptomatic and symptomatic patients

Asymptomatic patients	**Travellers and migrants**	**Initial screening:** serology schistosoma-specific IgM, IgG and IgE)	If positive, follow-up testing by microscopy
	Patients from endemic areas	Antigen testing	
Symptomatic patients		Early infection (<3 months post-exposure)	Initial negative serology ± microscopy ± antigen testing does not rule out disease PCR on blood, faeces or urine can be considered if diagnosis is still clinically suspected
		Initial screening: Serology (schistosoma-specific IgM, IgG and IgE)	If positive, follow-up testing by microscopy ± antigen testing ± PCR on blood, faeces or urine
Patients with suspected ectopic phenomena		Clinical and radiology Microscopy (e.g. bronchial washing) Histology	
Patients with suspected neuroschistosomiasis		Clinical and radiology (and evidence of disease at an extraneural site) **OR** Histology of central nervous system lesion and/or serology (schistosoma-specific IgM, IgG and IgE) or PCR on CSF	
Patients with suspected glomerular disease		Clinical Serology (schistosoma-specific IgM, IgG and IgE) Antigen testing Rectal submucosa biopsy Renal biopsy	

Please contact your local Ampath pathologist for more information.

Microscopy: Repeated examination of urine or stool collected over several days may be necessary; urine should be collected between 10am and 2pm; in light infection or intermittent excretion, a rectal snip may be considered.

Antigen testing: Serum-circulating anodic antigen (CAA – all schistosome species) and urine-circulating cathodic antigen (CCA – particularly useful in *Schistosoma mansoni*) is available; for CCA, a midstream urine sample is preferred and should be refrigerated post-collection.

Serology: Schistosoma-specific IgM, IgG and IgE testing is suggested; any variation of the antibody response can be expected; non-human schistosomes may cross-react with serological assays; do not use serology for follow-up of case.

Haematology, clinical chemistry and other special investigations

Full blood count and differential count:

- Eosinophilia (may be earliest laboratory indicator for infection; supports active schistosomiasis; absence thereof does not exclude it).
- Hypochromic microcytic anaemia and thrombocytopenia.

Iron studies

Blood cultures:

- Prolonged bacteraemia with *Salmonella* species can be seen in patients with chronic disease.

Malaria testing should always be considered in the differential diagnosis for acute febrile illness.

Additional investigations that may be considered in chronic schistosomiasis

- Liver function tests
- Urea, creatinine and electrolytes
- Urine culture
- HIV testing
- Hepatitis B and C serology
- Faecal occult blood and faecal calprotectin
- Radiological imaging

Follow-up

Microscopy:

- Stool and urine should be examined for eggs six to eight weeks after symptoms subside and require repeat praziquantel administration if still positive (antischistosomal drugs may temporarily inhibit egg laying by adult worms).
- Stool and urine should be examined for up to six months after completion of therapy in both acute and chronic disease.

Antigen testing:

- Clearance can be seen within a few days or weeks after successful treatment.

Repeat parasitological studies should be prompted by eosinophilia, haematuria and persistence of symptoms.

References

Available on request.