REFUGEE HEALTH
NETWORK QUEENSLAND

Strongyloides

1 Introduction

1.1 Purpose

This clinical guideline is to ensure that patients from a refugee background receive appropriate screening and treatment for Strongyloides, within a primary care setting where appropriate.

2 Clinical Guideline

2.1 Background

Strongyloides is a parasitic disease caused by Strongyloides stercoralis. This soil-transmitted helminth may lead to serious infection as it persists in the body if it is not treated.[1,2] The patient may not have symptoms until they become immunosuppressed. Immunosuppression may precipitate severe disseminated disease, leading to rapid deterioration and death within 24 hours if the diagnosis is not considered.[3,4] The infection persists in the host through autoinfection as the parasite can travel anywhere throughout the body and return to the gut and breed there without leaving the body for any part of the life cycle.[2]

2.2 Life Cycle

The Strongyloides worms live in faeces and pass to the moist warm soil. Young worms enter the body through hair follicles and secrete an acid to help burrow through the skin. Once in the body the worm can find its way to anywhere in the body, feeding on the body's cells and fluids. It can travel in the blood vessels through the heart to the lungs. Once in the lungs it can travel up to the larger airways and be swallowed into the stomach. Female worms burrow into the gut lining and feed on the gut cells and lay eggs that develop into worms that travel through the faeces out of the body to continue the cycle again. Some worms do not pass out of the body but grow into young worms that can remain in the body as 'autoinfective larvae'. This autoinfective life cycle means that strongyloidiasis may persist in an individual for decades after they have left an endemic area.[1,2]

2.3 Diagnosis

Strongyloides may be completely asymptomatic.
It can cause mild or severe symptoms in some people but is most likely to cause serious symptoms if a patient is immunocompromised e.g. with steroid therapy for an intercurrent illness.[2]

Spread to different organs can cause:

- Gut – abdominal distension, diarrhoea, abdominal and epigastric pain, indigestion, malabsorption, offensive faeces, subacute obstruction or segmental ileus, ulcerative colitis with intestinal perforation and peritonitis.
- Brain – meningitis, CNS signs and symptoms
- Urinary tract – UTI, granulomata and/or abscesses in liver and kidney
- Skin – larva currens (migratory, changing hour to hour), raised itchy patches, lesions over lower back and buttocks, recurrent urticaria
- Lungs – respiratory problems, including haemoptysis, pneumonia, dyspnoea, bronchospasm, lung abscess

When the worms pass into the body from the gut they can carry infective agents with them to cause bacteraemia/ septicaemia.

2.4 Investigation

- **Serology**: Serology is useful for excluding infection in adults and diagnosing strongyloides in symptomatic patients, or those at particular risk, such as those about to commence immunosuppressive therapy.[2,4] The anti-Strongyloides antibody enzyme-linked immunosorbent assay (EIA) detects IgG antibodies. It can be used for screening, diagnosis, and post-treatment monitoring.
- **Faeces**: Microscopy of faeces is the gold standard for diagnosis. It has high specificity, however, is limited by low sensitivity (0-50%). A single stool specimen alone is insensitive for the diagnosis of strongyloides.[3]

2.5 Management

Before treating – consider the issues on page 3.

If the serology is positive then, after ensuring that the patient is not pregnant, treat with two doses of Ivermectin 200mcg/kg as a stat dose that is repeated two weeks later.[2,4]
This regime has a nearly 100% cure rate in chronic Strongyloides infection compared to an approximately 80% cure rate with the single dose regimen.
Follow-up is advised: Recall for repeat serology and eosinophil count at 6 months will ensure successful treatment.
If the serology is still positive then retreatment is necessary.
Further follow-up is advised: If still positive after the second course of Ivermectin then medical review is advised.
Further treatment with 3 doses of Ivermectin given one month apart may be considered.

If **serology is equivocal**
If the patient is at high risk[1] (e.g. from an endemic area) then treat with Ivermectin
Follow-up at 6 months with serology and eosinophil count, as above.

If the **serology is negative** then no treatment is necessary.

If follow- up serology shows that the level is reducing and there is no eosinophilia then continued follow-up in six more months is reasonable.
If follow-up serology is negative then no further follow up is required.
Consider review at two years to ensure eradication was successful.
Follow-up is especially important if the patient is at high risk of re-infection.[4,5]

Ivermectin (Stromectol) Dosage:

Approximately 200mcg/kg [2,4]
15-24kg 1 tablet
25-35 kg 2 tablets
36-50kg 3 tablets
51-65kg 4 tablets
66-79kg 5 tablets
The medication is given as an oral dose with water.
Treatment with Albendazole does not appear to be as effective (approx. 38% cure) and the positive serology often persists.
Ivermectin is metabolised in the liver and needs to be given with caution in patients with liver disease.

Caution: If the patient is pregnant and asymptomatic but has positive strongyloides serology, it is advised to delay treatment with ivermectin until after delivery, and withheld during the first week of breastfeeding.
If the patient is pregnant and symptomatic, treatment should be discussed with an Infectious Diseases (ID) Specialist.
If the patient is immunocompromised, treatment should be discussed with an ID Specialist.

Before treating – consider the issues listed below.

2.6 Other considerations before treating with Ivermectin.

If the patient has serology positive for Strongyloides and if **LOA LOA INFECTION is suspected e.g.** If a patient has symptoms of Loa Loa, then arrange for 2-3 blood films for this parasite and repeat serology and refer for a consultation with ID Specialist.[6] In persons from West or Central Africa co-infected with Loa loa, ivermectin treatment can cause encephalopathy and other severe adverse reactions[2]
Consider Loa Loa in patients with symptoms such as:

- Transient subcutaneous swellings which may be associated with intermittent pain or urticaria
- Conjunctivitis
- Persistent eosinophilia.

If the patient is under 15 kg and **is serology positive for Strongyloides** then it is appropriate to refer to a paediatric ID Specialist for treatment.

If the patient comes from a country where there is a <u>HIGH risk</u> for Loa Loa (e.g. Cameroon, Equatorial Guinea, Gabon, Nigeria, Central African Republic, Democratic Republic of Congo[4]) **and is serology positive for Strongyloides and** over 15 kg in weight, then arrange for a single midday Giemsa stained blood film for the Loa Loa parasite prior to treatment.
If this is positive then arrange for ID follow up. If this is negative then arrange for treatment with Ivermectin as per usual treatment.
When Loa Loa is present, ID Specialist review for treatment is advised. Treatment is often with albendazole: 400mg 12 hourly for 3 days and with a repeat course after 14 days.

2.7 Document Review and Approval

Person Name / Committee	Position (if applicable)	Function (Owner | Approve | Review)
Dr Margaret Kay	General Practitioner	Document Owner
Dr Rebecca Farley	General Practitioner	Document Reviewer
Dr Rachel Claydon	General Practitioner	Document Reviewer
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2.8 References

1 Schär F, Trostdorf U, Giardina F, Khieu V, Muth S, Marti H, Vounatsou P, Odermatt P. Strongyloides stercoralis: Global Distribution and Risk Factors. PLoS Negl Trop Dis. 2013;7(7):e2288.

2 Chaves NJ, Paxton G, Biggs BA, Thambiran A, Smith M, Williams J, Gardiner J, Davis JS; on behalf of the Australasian Society for Infectious Diseases and Refugee Health Network of Australia Guidelines writing group. Recommendations for comprehensive post-arrival health assessment for people from refugee-like backgrounds. Available from: https://www.asid.net.au/products/refugee-guidelines-2016

3 Uparanukraw P et al. 1999.Fluctuation of larval excretion in Strongyloides stercoralis infection. Am J Trop Med Hygiene; 60(6):967–73.

4 Centers for Disease Control and Prevention. Intestinal parasite guidelines for domestic medical examination for newly arrived refugees. [Accessed May 2015] Available from: http://www.cdc.gov/immigrantrefugeehealth/pdf/intestinal-parasites-domestic.pdf

5 Geri G, Rabbat A, Mayaux J, Zafrani L, Chalumeau-Lemoine L, Guidet B, Azoulay E, Pène F. Strongyloides stercoralis hyperinfection syndrome: a case series and a review of the literature. Infection. 2015 May 26. [Epub ahead of print]

6 Taylor MJ, Hoerauf A, Bockarie M. Lymphatic filariasis and onchocerciasis. Lancet 2010; 376: 1175–85.