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Recommendations for presumptive treatment of schistosomiasis and strongyloidiasis among the Somali Bantu refugees

## SUMMARY

In a recent investigation, a high prevalence of schistosomiasis and strongyloidiasis was found among the Somali Bantu refugee group. To prevent future morbidity from these diseases, the Centers for Disease Control and Prevention (CDC) recommends that Somali Bantu refugees should receive pre-departure presumptive treatment for schistosomiasis and strongyloidiasis. Additionally, all members of the Somali Bantu refugee group who have resettled to the U.S. should receive presumptive treatment for schistosomiasis and strongyloidiasis. The regimens for presumptive treatment are the same whether they are given overseas or after arrival to the U.S. (Figure 1). Treatment for schistosomiasis should consist of praziquantel (Biltricide<sup>®</sup>) at a dose of 20 mg/kg, given in two oral doses 6-8 hours apart for refugees at least 4 years of age. For Somali Bantu refugees, the recommended treatment of strongyloidiasis is ivermectin (Stromectol<sup>®</sup>) at a dose of 200 mcg/kg in one oral dose for refugees weighing at least 15 kilograms (kg).; Somali Bantu refugees at least 1 year of age would also need albendazole (Albenza<sup>®</sup>) at a dose of 600 mg, given in one oral dose to provide coverage for other intestinal parasites. An alternative regimen, though not preferred, for strongyloidiasis presumptive therapy for Somali Bantu refugees is albendazole, 400 mg,

given in one oral dose twice a day for 7 days. This document provides background information on the investigation, rationale for the recommendations, and technical information for physicians.

## **BACKGROUND**

CDC recently conducted an epidemiologic investigation of schistosomiasis and strongyloides among the Somali Bantu. Serologic testing for these parasitic diseases was performed by CDC Division of Parasitic Diseases.<sup>1</sup> The investigation identified a high prevalence of these parasitic infections. CDC performed schistosomiasis and strongyloides testing on 100 sera remains, with identifying information removed, from pre-immigration medical screening from Somali Bantu refugees. The Somali Bantu refugees are still being resettled. Among the 100 refugees tested, 69 (69%) tested positive for schistosomiasis and 23 (23%) tested positive for strongyloidiasis. Immunoblot testing was performed on all positive specimens; 1 (1%) was infected with *Schistosoma mansoni*, 57 (57%) were infected with *S. haematobium*, and 11 (11%) were infected with both.

Before departure from Africa, U.S.-bound refugees ages 2 years and older currently receive one oral dose of albendazole (600 mg). Although albendazole is effective against many parasitic infections, this dosage of albendazole is inadequate to treat

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<sup>1</sup> The tests performed were CDC ELISA serologic tests. The schistosomiasis test is 99% and 90% sensitive in detecting antibodies to *Schistosoma mansoni* and *S. haematobium*, respectively. The test for strongyloidiasis is 95% sensitive in detecting antibodies to *Strongyloides stercoralis*. While the sensitivity and specificity of stool tests for either schistosomiasis or strongyloidiasis and urine tests for *S. haematobium* can vary depending on the number and technique of the tests performed, these CDC serologic tests have much greater sensitivity. Both these tests are available only at CDC; no locally available serologic tests for schistosomiasis or strongyloidiasis have known reliability.

strongyloides and does not provide any coverage for schistosomiasis. Without treatment, both schistosomiasis and strongyloidiasis can lead to significant morbidity, such as liver failure from chronic schistosomiasis infection and the hyperinfection syndrome in immunocompromised persons with strongyloidiasis infection. Therefore, even asymptomatic persons with these parasitic infections should be treated.

## **RECOMMENDATIONS**

Based on the high prevalence of schistosomiasis and strongyloides and to prevent future morbidity from these diseases among others who were not tested, CDC recommends modifications to the pre-departure and post-arrival presumptive treatment protocols.

Thus, for Somali Bantu refugees, CDC recommends the following:

- 1) The modification of the current pre-departure presumptive intestinal parasite treatment for Somali Bantu refugees to include adequate treatment for schistosomiasis and strongyloidiasis.
- 2) The administration of post-arrival presumptive treatment among Somali Bantu refugees who did not receive pre-departure treatment.

## **PRESUMPTIVE PRE-DEPARTURE TREATMENT**

Figure 1 provides a summary of the recommendations for Somali Bantu refugees. The recommended treatment for schistosomiasis is praziquantel at a dose of 20 mg/kg, given in two oral doses 6-8 hours apart given to refugees at least 4 years of age.

The drug of choice to treat strongyloides is ivermectin (200 mcg/kg in one oral dose). Ivermectin should not be administered to refugees weighing less than 15 kg. Refugees greater than 1 year of age who receive ivermectin for strongyloides must still receive one oral dose of albendazole (600 mg) to adequately treat them for other parasitic infections.

An alternative regimen for strongyloidiasis presumptive therapy is albendazole, 400 mg, given in oral doses, twice a day for 7 days. This regimen is the preferred regimen for refugees, such as Sudanese refugees, in whom concurrent *Loa loa* infection is a concern (and ivermectin can cause a potentially fatal encephalopathic reaction in persons with high levels of microfilaremia). However, the Somali Bantu originated and were resettled from an area outside the geographic distribution of *Loa loa* and therefore concurrent loiasis is not a concern among the Somali Bantu refugees. While this alternative regimen is an option, ivermectin is the preferred medication for strongyloidiasis.

Praziquantel, albendazole, and ivermectin may be administered concurrently (WHO, oral communication).

## **PRESUMPTIVE POST-ARRIVAL TREATMENT**

All Somali Bantu refugees who were ineligible to receive presumptive therapy for schistosomiasis and strongyloidiasis at the time of resettlement should receive praziquantel and ivermectin as described in the recommendations for pre-departure treatment (Figure 1). Because Somali Bantu refugees ages 2 years and older at the time of resettlement should have received albendazole (600 mg) prior to departure, albendazole would not need to be given again upon arrival. However, if pre-departure

albendazole treatment is not documented on DS Form #2053, albendazole (600 mg) should also be given in one oral dose.

Somali Bantu refugees who resettled prior to the implementation of these recommendations should receive praziquantel, ivermectin, and albendazole (600 mg) when they reach the appropriate age and weight.

An alternative, though not preferred, regimen for post-arrival strongyloidiasis presumptive therapy is the extended albendazole regimen (400 mg, given in oral doses, twice a day for 7 days) (Figure 1). As with pre-departure treatment, praziquantel, albendazole, and ivermectin may be administered concurrently.

## **PRECAUTIONS AND CONTRAINDICATIONS TO PRESUMPTIVE TREATMENT**

Presumptive treatment should be administered to all refugees, except for the following circumstances. For many of these circumstances, testing for schistosomiasis and strongyloidiasis is presented as an option. Testing for schistosomiasis and strongyloidiasis can consist of stool (for *S. mansoni* and strongyloidiasis) or urine (*S. haematobium* only) examinations. Physicians ordering testing should be aware that the CDC serologic tests are far more sensitive than either stool or urine examinations. Thus, urine and stool microscopy tests for these parasitic diseases cannot be used to rule out infection and serologic testing should be considered for patients who test negative by stool and urine microscopy.

## 1. Children

Children under 1 year of age should not receive presumptive treatment. Children greater than 1 year of age can receive albendazole therapy. Children under 4 years of age should not receive praziquantel. Children weighing less than 15 kg should not receive ivermectin. However, there has been extensive overseas use of these medications during World Health Organization (WHO) helminth control activities. For overseas situations in which therapy for children may otherwise be indicated, the Division of Global Migration and Quarantine should be contacted. For post-arrival situations, CDC's Division of Parasitic Diseases should be consulted (770-488-7775). Physicians should be aware that serologic testing for children can be performed through the Division of Parasitic Diseases (770-488-7775).

For overseas refugee children who do not meet the minimum age or weight requirements for presumptive therapy, the need for subsequent treatment should be indicated on the appropriate Immigration Health Assessment form (DS Form #2053).

## 2. Pregnant women

Praziquantel is a pregnancy category B drug, while ivermectin and albendazole are pregnancy category C drugs. Women of childbearing age who may be pregnant should have a negative pregnancy test prior to administration of these medications.

Presumptive overseas pre-departure treatment for pregnant women should be deferred until after delivery. Any instances of pregnant women who are immunocompromised prior to pregnancy or have clinical signs and/or symptoms of disease should be discussed with clinicians in the Division of Global Migration and Quarantine. For pregnant women who are overseas, the need for subsequent treatment after delivery should be indicated on the appropriate immigration health assessment form (DS Form #2053).

For pregnant women who have arrived in the U.S., presumptive treatment can be deferred until after delivery. Alternatively, serologic tests can be performed at CDC and a decision about treatment for women who test positive can be made in conjunction with clinicians from CDC's Division of Parasitic Diseases (770-488-7775). Pregnant women who are immunocompromised should be tested for schistosomiasis and strongyloides at CDC.

### 3. Women who are breastfeeding

Praziquantel can be administered to lactating women, but the milk should be discarded for 72 hours following treatment with praziquantel. Ivermectin is excreted in human milk in low concentrations. Mothers who intend to breast feed should be treated with ivermectin only when the risk of delayed treatment to the mother outweighs the risk to the newborn. Because it is unknown whether albendazole is excreted in human milk, caution should be exercised when albendazole is administered to a lactating woman.

Pre-departure presumptive treatment for lactating women can be delayed until they are no longer breastfeeding. Although these medications can be administered to lactating women under certain considerations, concerns about the safety of alternative milk supplies overseas justify the postponement of presumptive treatment. For immunocompromised women who are lactating and lactating women who have clinical signs and/or symptoms of disease, decisions about treating these women overseas should be made in consultation with clinicians from the Division of Global Migration and Quarantine. For lactating women who are overseas, the need for subsequent treatment should be indicated on the appropriate immigration medical examination form (DS Form #2053).

For lactating women who have arrived in the U.S., presumptive treatment may be postponed until they are no longer breastfeeding. Alternatively, lactating women can also be tested with serologic tests performed at CDC; decisions about treatment for women who test positive, immunocompromised women who are lactating, and lactating women who have clinical signs and/or symptoms of disease can be made in consultation with clinicians from CDC's Division of Parasitic Diseases (770-488-7775).

#### 4. Refugees who are immunocompromised<sup>2</sup>

Refugees who are immunocompromised, including refugees with AIDS, HIV infection, cancer, chronic steroid users, and persons who have had an organ

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<sup>2</sup> Except women who are pregnant or breastfeeding. See previous discussion regarding pregnant and lactating women.

transplant or who may receive an organ transplant, should receive presumptive treatment for schistosomiasis and strongyloides (Figure 1). Serologic testing of immunocompromised refugees is not necessary prior to treatment. However, physicians wishing to test immunocompromised refugees prior to therapy may do so through the Division of Parasitic Diseases (770-488-7775). While follow-up testing for schistosomiasis or strongyloidiasis is not routinely necessary after completion of presumptive therapy, immunocompromised patients should have serologic testing for strongyloides performed at CDC six months after treatment. No additional testing is required for schistosomiasis. Additional information about strongyloides testing is available at CDC's Division of Parasitic Diseases (770-488-7775).

#### 5. Refugees with cysticercosis infection

Persons who have cysticercosis infection may have seizures following treatment with praziquantel, ivermectin, or albendazole because these medications can kill *Taenia solium* cysticerci, thus provoking seizure activity. The prevalence of cysticercosis among African refugees is believed to be low based on the known geographic distribution of cysticercosis. Refugees with a history of seizures who have not been evaluated for cysticercosis should be evaluated before receiving these drugs. Refugees with cysticercosis should not receive presumptive treatment and should have serologic testing for schistosomiasis and strongyloidiasis performed at CDC. Physicians with questions regarding cysticercosis infection and its evaluation can consult clinicians from CDC's Division of Parasitic Diseases (770-488-7775).

## 6. Refugees with a seizure disorder not evaluated for cysticercosis

Patients with a seizure disorder that have not been evaluated for cysticercosis should be evaluated before receiving these drugs. Refugees who have a history of cysticercosis or are pregnant should not receive presumptive treatment and should have serologic testing for schistosomiasis and strongyloidiasis performed at CDC. Refugees who test positive for either of these infections should have a treatment plan developed in coordination with a physician.

Physicians should consult the package inserts for additional information about praziquantel, ivermectin, and albendazole.

### **POST-TREATMENT RECOMMENDATIONS AND FOLLOW-UP**

Follow-up testing for schistosomiasis or strongyloidiasis is not routinely necessary after presumptive treatment for these diseases is completed. However, persons who have symptoms that suggest failure of cure or morbidity from these diseases should have appropriate follow-up testing performed. Such patients should be under the care of a physician; CDC physicians are available to provide guidance in these situations.

In addition, persons who are immunocompromised or may become immunocompromised in the near future, including persons with AIDS, HIV infection, cancer, chronic steroid users, and persons who have had a transplant or who may receive a transplant are at high risk for *Strongyloides* hyperinfection syndrome. All refugees who have been treated should be counseled about this risk, and refugees who are immunocompromised should seek follow-up care with their primary physician.

Although routine follow-up testing is not necessary for immunocompetent refugees, immunocompromised persons should have a serologic test for *Strongyloides* performed by CDC at least 6 months after treatment to ensure cure has occurred. All refugees should be counseled that if they become immunocompromised in the future, *Strongyloides* testing should be performed at that time to rule out ongoing strongyloidiasis. CDC can provide additional consultation as needed for these patients or patients for whom presumptive therapy may have failed.

For questions regarding these recommendations, please contact Dr. Drew Posey (404-498-1601; [dposey@cdc.gov](mailto:dposey@cdc.gov)) or Dr. Michelle Weinberg (404-498-1652; [mweinberg@cdc.gov](mailto:mweinberg@cdc.gov)) at the Division of Global Migration and Quarantine.

Figure 1. Presumptive treatment of schistosomiasis and strongyloidiasis among Somali Bantu refugees.

