Can One Afford Not to Screen for Parasites in High-Risk Immigrant Populations?

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(See the article by Posey et al. on pages 1310–5)

The article by Posey et al. [1] in this issue of Clinical Infectious Diseases emphasizes once again the high prevalence of schistosomiasis and strongyloidiasis among African refugees. Similar findings have been noted in previous studies of refugees and immigrants from areas where these 2 parasites are endemic. For example, a very high seroprevalence of strongyloidiasis has been noted among refugees from Southeast Asia. In a Canadian study of Southeast Asian refugees, Gyorkos et al. [2] noted that 131 (76.6%) of 171 Kampucheans, 15 (55.6%) of 27 Laotians, and 4 (11.8%) of 34 Vietnamese persons were seropositive.

It was interesting to note the lack of association between abdominal pain and the presence of parasites in the studied population. However, this is not at all unexpected, given the fact that the vast majority of persons with parasitic infections remain asymptomatic unless the worm burden is high and/or the long-term damage from a chronic infection has led to pathological changes sufficient to cause illness.

It was more than the convenience of blood sample collection that led the authors to choose serologic screening for these 2 helminth infections (because, as we all know, most patients would rather provide a blood sample than a stool sample). Microscopic examinations of stool specimens (for Schistosoma mansoni) and urine samples (for Schistosoma hematoeicum) are relatively insensitive for the diagnosis of mild infections with these parasites. In persons with chronic strongyloidiasis, a single stool examination will yield positive results in only 30%–50% of cases [3]. Stool culture on a blood agar plate is much more sensitive and uses the motility of Strongyloides larvae to diagnose infection, because the tracks of larvae across a plate seeded with stool bacteria are readily detected. The sensitivity of this stool test has been estimated to be as high as 96% [4]. The use of eosinophilia as a marker for these helminth infections has been shown to be an unreliable screening technique [5, 6]. By far, serologic testing with the Falcon assay screening test ELISA and EIA are the most sensitive methods for diagnosing schistosomiasis and strongyloidiasis, respectively.

Even in persons with mild, asymptomatic infection, treatment of schistosomiasis is worthwhile to prevent possible long-term sequelae. Praziquantel is both safe and effective. However, the test of cure of infection may be difficult, because blood antigen tests are not uniformly available, serologic test results often remain positive for many years, eosinophilia may be absent, and eggs may not be present in stool and urine samples. If eggs are detected, it is important to remember that viable eggs (with viability determined by the hatch test, the presence of egg flame cells, and egg morphology) may be excreted for 2–3 months after receipt of treatment and that dead eggs may be excreted for many years after successful therapy.

All patients with strongyloidiasis, regardless of whether they are symptomatic, must be treated to prevent possible late-onset disseminated disease and hyperinfection, which has a mortality rate of >50%. Unlike schistosomes that have a limited life span (10–15 years), Strongyloides helminths are among the few that can complete a life cycle in the human host; therefore, infection can remain indefinitely. Symptomatic infections in World War II veterans have been described >50 years after the subjects had been released from prisoner-of-war camps in Southeast Asia [7, 8]. A 1-week course of albendazole or 2 doses of ivermectin are highly efficacious [9, 10]. A 3-day course of albendazole has relatively low efficacy, compared with a single dose of ivermectin [11, 12].

The test of cure for strongyloidiasis usually includes resolution of eosinophilia (when present) and reduction in Stron-
Strongyloides antibodies over a 6–12-month period. Repeated stool examinations alone may not be worthwhile, because of their low sensitivity; aspiration of duodenal fluid will provide a greater yield of organisms but is less practical. The blood agar plate test, however, is a practical and highly sensitive test for stool parasites.

Hyperinfection with strongyloidiasis occurs among immunocompromised patients (particularly those who are taking corticosteroids) and among patients with malignancies, malnutrition, alcoholism, or human T lymphotropic virus type 1 (HTLV-1) infection [13–16]. Although it may seem counterintuitive, patients with AIDS rarely develop hyperinfection; one hypothesis suggests that this is because disseminated infection requires the direct development of infective larvae in the gut, which is less likely to occur in patients with AIDS [17]. Clinically, hyperinfection syndrome is characterized by enteritis, pneumonitis (often hemorrhagic), gram-negative bacteremia (or meningitis or peritonitis), and hemorrhagic purpura of the anterior abdominal wall. Eosinophilia is often absent, and stool examination results are almost always positive. When the diagnosis is suspected and the results of stool microscopic evaluation are negative, the blood agar plate technique should be used. Serologic testing does not indicate the activity of the infection and may yield negative results in immunocompromised hosts. Sputum, duodenal, and bronchial aspirate specimens may be positive for filariform larvae. In patients with chronic, nondisseminated infection, the presence of rhabditiform larvae in stool specimens is the rule, whereas filariform larvae are rarely seen, except in cases of disseminated disease.

Management of a disseminated infection is often challenging, because patients are usually severely ill and unable to ingest oral medication. Albendazole, which is available only in oral form, is often not effective for the management of hyperinfection. If ivermectin cannot be administered by mouth, according to recent case reports, it may be given subcutaneously using a parenteral veterinary preparation or by the rectal route [18–21]. It is important to understand that many veterinary drugs meet the same rigorous standards of the US Pharmacopoeia and US Food and Drug Administration with regard to strength, quality, and purity as do drugs manufactured for human use. The duration of therapy for patients with disseminated infection has not been determined, but a prolonged course of ivermectin of 5–7 days is typical. Although immunosuppressive drugs should ideally be withdrawn, this is usually not practical. Because the internal cycle of parasite development is 2 weeks, patients should be observed for 2 weeks and undergo multiple stool examinations, preferably using the blood agar plate technique. To prevent a recurrence of disseminated infection when immunosuppression persists or in persons with HTLV-1 infection, a regimen of 2 doses (200 μg/kg) of ivermectin (given once daily) every 2 weeks has been used to keep larvae suppressed, but even this approach may fail [22]. Because stool and sputum often contain infective filariform larvae that may penetrate unbroken skin, contact precautions should be undertaken by hospital staff.

In view of the high mortality rate for disseminated strongyloidiasis—even if appropriate treatment is administered—prevention of infection is a much better option than attempts to cure. A high index of suspicion for infection is paramount. A recent study of US physicians who were in training revealed remarkably poor knowledge about the presentation and management of strongyloidiasis [23]. Any individual with risk factors for acquiring S. stercoralis infection who has eosinophilia, who has received a diagnosis of HTLV-1 infection, or who is to undergo immunosuppressive therapy, particularly with corticosteroids, should be screened by serologic testing. If that is not possible (e.g., a patient urgently requires immunosuppressive therapy), empirical treatment with ivermectin (200 μg/kg daily for 2 days) should be initiated. Some experts would repeat the regimen 2 weeks later [14].

Given the large number of immigrants to industrialized countries who have come from developing countries, it is incumbent upon infectious diseases physicians to educate primary care physicians in their referral practice to screen these immigrants for the presence of parasites, particularly S. stercoralis. In addition, this infection should be considered in any patient who is about to receive an immunosuppressive regimen and in ill immunocompromised hosts who have come from an area of endemicity. Failure to prevent or diagnose Strongyloides hyperinfection in a high-risk patient can lead to dire consequences for both the patient and the treating infectious diseases physician.

On the basis of the data presented by Posey et al. [1], it is difficult to argue about the need for screening and/or presumptive treatment of parasite infections in high-risk individuals before their emigration. However, the importance of screening for schistosomiasis and strongyloidiasis in newly arrived immigrants cannot be overstated. These tests (in addition to other serologic tests, such as tests for hepatitis B and C viruses and HIV, stool examinations for intestinal parasites, a tuberculin skin test, and others) may be appropriate for certain populations of new Americans who have emigrated from high-risk areas or from high-risk social circumstances. All physicians who see such patients need to be aware that immigrants from less-developed countries often require a different approach to health care. A high index of suspicion for imported infections is essential for symptomatic individuals, as is the need to screen for imported infections that potentially may become a public health problem or lead to personal health problems at a later date.

Acknowledgments

References


