

Parasitic Infections Seen in Impoverished Areas

*The prevalence of *Trichomonas vaginalis* in the United States is estimated at 20 million people.*

BY KERRI WACHTER

FROM A TELECONFERENCE SPONSORED BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION

Certain infectious diseases can concentrate in impoverished areas and disproportionately affect minorities, women, and other disadvantaged groups, according to Dr. Paul T. Cantey.

Clinicians often receive little training on infectious diseases seen in these areas, which include tribal lands and border regions in the southwestern United States, the Mississippi Delta, the Cotton Belt, Appalachia, and some dense urban areas.

Dr. Cantey outlined the diagnosis and treatment of three of these diseases – Chagas disease, toxocariasis, and trichomoniasis – during the teleconference.

Dr. Cantey is a medical officer in the Centers for Disease Control and Prevention's division of parasitic diseases and malaria.

Chagas disease

Chagas disease is caused by the protozoan parasite *Trypanosoma cruzi*. The primary mode of transmission is through infected triatomine bugs. Other modes of transmission include blood transfusion, organ and tissue transplantation, congenital infection, laboratory accidents, and food.

Chagas disease is endemic in much of Latin America. However, both the parasite and the triatomine bug are found in the United States. It's estimated that there are at least 300,000 infected Latin American immigrants living in the United States. California, Florida, and Texas are disproportionately affected. Other geographic concentrations include Arizona, Georgia, Illinois, New York, North Carolina, and Virginia.

Blood donor screening for *T. cruzi* started in early 2007. Since then 1,267 infected donors have been identified. More than 40 of these individuals had no recognized risk factors.

The acute phase of the disease lasts 4-8 weeks. Patients are usually asymptomatic during this period. An estimated 10%-20% of infected individuals may have nonspecific febrile illness. Romaña's sign (chagoma) occurs less frequently.

The chronic phase is lifelong and may be asymptomatic and indeterminate in form. Approximately 20%-30% of infected individuals will manifest symptomatic disease – heart failure, sudden death, stroke, or organomegaly.

Testing for Chagas disease is available through the CDC, Dr. Cantey said. For

acute infection, a blood smear, hemoculture, and polymerase chain reaction (PCR) tests are useful. For chronic infection, serologic tests are useful. However, there is no preferred test.

Tests for acute infection are sensitive, but the acute phase often is not recognized. Tests for chronic infection have issues with sensitivity and specificity, and usually positive results from two different tests are needed for diagnosis.

Nifurtimox or benznidazole are used for treatment, although neither drug is approved by the Food and Drug Administration. Both are available through

CDC's investigational new drug protocol for compassionate use. Data on the efficacy of these two drugs for the treatment of chronic infection are still evolving.

Side effects are frequent, especially in adults, and require monitoring. These effects include anorexia and weight loss, nausea and vomiting, insomnia, convulsions, headache, myalgias and arthralgias, mucosal edema, hepatic intolerance, and skin manifestations. Yearly physicals should be performed, along with an ECG with a rhythm strip.

Treatment should always be offered for acute infections, congenital disease, and for children and adolescents 18 years and younger with chronic infection, and immunocompromised patients with reactivation, said Dr. Cantey. Treatment generally should be offered to women of reproductive age, adults aged 50 years and younger with indeterminate form disease or with mild to moderate cardiomyopathy, and patients in whom immunosuppression is anticipated.

Treatment generally should not be offered to patients with advanced cardiomyopathy with congestive heart failure and patients with impairment of swallowing. Treatment should almost never be offered during pregnancy or to patients with severe renal or hepatic insufficiency, Dr. Cantey said.

Toxocariasis

Toxocariasis in humans is caused by infection with larval stages of dog/cat roundworm. *Toxocara* eggs are shed in dog and cat feces, and humans become infected through ingestion. Larvae mi-

grate and encyst in humans but do not develop into adults or reproduce in humans.

According to data from the National Health and Nutrition Examination Survey (NHANES), approximately 14% of the U.S. population is infected. The highest prevalence is in the southern United States (less than 17%). Toxocariasis affects non-Hispanic blacks more than other groups and is associated with poverty, low education level, and dog ownership.

Many infected individuals are asymptomatic, said Dr. Cantey. In children, symptoms include fever, headache, behavioral and sleep disturbances, cough, anorexia, abdominal pain, hepatomegaly, nausea, and vomiting. Eosinophils may or may not be present. In adults, symptoms include chronic dyspnea, weakness, rash, pruritus, and abdominal pain. Eosinophilia is often present in adults.

Visceral toxocariasis typically occurs in children aged 2-7 years. Symptoms include fever, lower respiratory symptoms, hepatomegaly, abdominal pain, and anorexia. Other symptoms are specific to the organ involved and include hepatic granulomas, chronic prurigo, pruritus, urticaria, eczema, vasculitis, eosinophilic meningitis or encephalitis, myelitis, optic neuritis, radiculitis, cranial nerve palsy, and, less commonly, myocarditis, nephrotic syndrome, and arthritis. Lab-

treatment. Visceral disease is treated with 5 days of albendazole; corticosteroids may be used for allergic symptoms. Ocular toxocariasis is treated with 2-4 weeks of albendazole, along with aggressive anti-inflammatory treatment with corticosteroids, and surgery. Albendazole is not approved by the FDA for this indication.

Trichomoniasis

Trichomonas vaginalis is a parasite that is spread through sexual contact. It's estimated that there are 5-7 million cases yearly in the United States. However, the prevalence may be as great as 20 million. The rate is 10-fold greater among black women, compared with non-Hispanic white women (13.3% vs. 1.3% respectively).

Patients with trichomoniasis can be asymptomatic. In women, symptoms include vaginal discharge, pruritus, and dysuria; in men, symptoms include urethral discharge and dysuria.

Physical examination may reveal mucopurulent discharge, "strawberry cervix" (colpitis macularis), cervical erythema, or cervical friability.

T. vaginalis infection can cause premature rupture of membranes in pregnant women, preterm birth, low birth weight, pelvic inflammatory diseases, and increased susceptibility to HIV transmission.

In terms of diagnosis, wet preparation examination is only 60%-70% sensitive in women. Two point-of-care tests (OSOM *Trichomonas* Rapid Test and Affirm VP III) are available. These tests, performed on vaginal secretions, are more than 83% sensitive and more than 97% specific. Pap smears are not recommended for *Trichomonas* screening. In men, wet preparation of urethral discharge, prostatic secretions, or urethral scrapings is of uncertain sensitivity. Instead, PCR or culture on special media should be used.

Trichomoniasis is treated with metronidazole or tinidazole. If treatment with 2 g metronidazole given once fails (and reinfection is excluded), then patients should be treated with 500 g metronidazole twice daily for 7 days or with 2 g tinidazole once. If either therapy fails, then treat with 2 g metronidazole or 2 g tinidazole daily for 5 days. If this treatment fails, consult the CDC for testing and management (404-718-4141 or www.cdc.gov/std). Sex partners of patients should be treated to prevent reinfection.

Metronidazole is pregnancy category B and tinidazole is pregnancy category C. Asymptomatic pregnant women should be counseled about the risks and benefits of treatment, Dr. Cantey noted. ■



The assassin bug, also known as the kissing bug, is a blood-sucking triatomine insect that carries *Trypanosoma cruzi*.

oratory test results show marked eosinophilia, anemia, hypergammaglobulinemia, and increased titers to A and B blood group antigens.

Ocular toxocariasis typically occurs in 5- to 10-year-olds. Usually a single eye is affected. Symptoms include strabismus, unilateral decreased vision, and leukokoria.

Enzyme-linked immunosorbent assay (ELISA) is 78% sensitive and 92% specific for the diagnosis of visceral toxocariasis. However, the sensitivity is lower for ocular toxocariasis. The disease cannot be diagnosed from stool, as the eggs are not excreted by humans, said Dr. Cantey.

Mild toxocariasis often does not need