



Chagas Disease Update - Texas, 2016

Chagas disease, also called American trypanosomiasis, is caused by infection with *Trypanosoma cruzi*, a hemoflagellate protozoan parasite. The disease is endemic only to the Americas, from north of the Patagonia region of South America to the southern half of the United States (U.S.), including all regions of Texas. Human infection occurs commonly in parts of Latin America, but relatively rarely within the U.S. The U.S. Centers for Disease Control and Prevention (CDC) estimates that approximately 300,000 people within the U.S. (predominantly immigrants from highly endemic areas of Latin America) are infected and the Pan American Health Organization (PAHO) estimates that approximately 8 million people in Latin America are infected, with approximately 12,000 deaths per year throughout the Americas. Locally-acquired human cases occur in Texas, but are relatively uncommon. In the first two calendar years (2013-2014) since Chagas disease became reportable to the Department of State Health Services (DSHS), 39 human cases have been reported- 24 foreign-acquired, 12 locally-acquired, and 3 for which the location of acquisition is unknown.

Transmission

T. cruzi is transmitted in the feces of numerous species of blood-feeding triatomine bugs (also called reduviid bugs, kissing bugs, or cone-nosed bugs) and is predominantly maintained in a triatomine-mammalian wildlife transmission cycle. Since 2012, approximately 45% of the triatomines submitted to DSHS for testing at CDC have been positive for *T. cruzi*. Human infection most commonly occurs when feces from infected bugs are inoculated into the bite wound inflicted during feeding, other skin wound, or a mucous membrane.

Transmission can also occur via blood transfusion, organ transplantation, congenital transmission, ingestion of food or beverages contaminated with infected bugs or bug feces and, rarely, exposure to infected tissues or fluids in laboratory or medical settings. The factors affecting the lower triatomine-to-human transmission rates in the U.S. are not completely understood, but presumably include infrequent human exposure due to better housing construction, less tendency by most North American triatomine species to infest human dwellings, and lower-risk feeding/defecation habits of North American triatomine species.

Clinical Disease

There are two phases of Chagas disease: acute and chronic. Both phases can be symptom-free or life-threatening. The acute phase occurs in the first 8 weeks of infection. This phase may go unnoticed because it is often symptom-free or may be characterized by mild, non-specific symptoms and signs such as fever, malaise, body aches, rash, headache, loss of appetite, vomiting and/or diarrhea. Medical examination can reveal mild enlargement of the liver or spleen, swollen lymph nodes, and local swelling (a chagoma) where the parasite entered the body. The most recognized marker of acute Chagas disease is Romaña's sign, which includes swelling of the eyelids on the side of the face near the bite wound or where bug feces were deposited or accidentally rubbed into the eye. Rare occurrence of cardiac, cerebral, or meningeal inflammation can be life-threatening. Symptoms can last weeks to months and then abate, even without treatment. Symptoms during the acute phase can be more pronounced in people with weakened immune systems.

The chronic phase includes an asymptomatic form ("indeterminate" or "latent") and a symptomatic form. The majority of people in this phase will remain asymptomatic for life, but 20-30% will develop illness including:

- cardiac complications, which can include an enlarged heart (cardiomyopathy), heart failure, altered heart rate or rhythm, and cardiac arrest (sudden death);
- intestinal complications, which can include an enlarged esophagus (megaesophagus) or colon (megacolon) and can lead to difficulties with eating or with passing stool.

Laboratory Diagnosis

The CDC offers a comprehensive suite of tests for the diagnosis of acute and chronic Chagas disease. Laboratory diagnosis of acute Chagas disease can be made via microscopic identification of *T. cruzi* in blood smears and detection of *T. cruzi* DNA by polymerase chain reaction (PCR). Prior to collecting diagnostic specimens for the diagnosis of acute Chagas disease (i.e. in neonates born to a Chagas-positive mother; in recipients of organs or blood from a Chagas-positive donor; in lab/occupational exposures; and in persons with confirmed exposure to a *T. cruzi*-infected triatomine bug), clinicians should consult with DSHS Regional Zoonosis Control (ZC) program staff. If the situation appears to warrant PCR testing, ZC staff will provide CDC's contact information to the provider so they can consult with a CDC epidemiologist. If CDC agrees to test

the sample, it must be sent to the DSHS Laboratory for routing to CDC (select “Chagas disease” in Section 10: CDC Reference Tests on the G-2A submission form).

Laboratory diagnosis of chronic Chagas disease is based upon serologic testing. Because no currently-available serologic test is sensitive or specific enough to confirm a diagnosis, two different format serologic tests which use different parasite antigen preparations to detect *T. cruzi*-specific antibody are used to determine infection status. Serum specimens collected for the diagnosis of chronic Chagas disease should first be screened at one of the commercial laboratories which offer testing (currently Focus, Quest, ARUP, and Mayo Medical Laboratories). Samples that test positive at a commercial laboratory can then be forwarded to the DSHS Laboratory for routing to CDC for confirmatory testing. Blood donors who receive a letter stating that they tested positive for Chagas disease should have serum collected and tested at one of the commercial laboratories before additional testing at CDC is performed.

Blood Donations

First-time blood donations are currently screened for *T. cruzi* infection. Donors testing positive will be notified by the blood bank and are advised to consult their medical provider for confirmatory testing and clinical evaluation. Blood donor screening tests are not suitable for confirmation of clinical diagnosis.

Clinical Evaluation of Laboratory-Diagnosed Patients

For patients who test positive on blood donor screening tests or laboratory tests, medical providers should obtain a thorough history to evaluate potential routes of exposure, travel to or residence in areas endemic for human disease, previous history of blood transfusions or organ/tissue transplants, and the possibility of maternal transmission. Baseline clinical workup should include a complete physical exam and a 12-lead ECG with a 30-second lead II rhythm strip. Additional cardiac and gastrointestinal studies may be performed if indicated by the patient’s symptoms or clinical signs. Evaluation and testing of household contacts may be indicated for those sharing similar risk profiles and is strongly recommended if maternal transmission is a possibility, either from the index case or to the index case. Patients should be counseled not to donate blood or tissues for the remainder of their lifetime.

Treatment

Antiparasitic treatment is indicated for all acute infections, for chronic infections in children up to 18 years of age, for chronic infection in adults up to age 50 who have no indication of advanced cardiomyopathy, and for reactivated infections in immunocompromised patients. The decision to treat patients falling outside of these guidelines should be made weighing the potential benefits and risks to the individual patient.

Two drugs- nifurtimox and benznidazole- are available for treatment of U.S. patients. Neither drug is FDA-approved, and both are only available through the CDC under investigational protocols. Both drugs may cause significant side effects that some patients may not tolerate.

Triatomine Bug Testing Services

DSHS, in conjunction with CDC, provides testing of triatomine bugs for the presence of *T. cruzi*. Due to laboratory workload and budget constraints at the testing laboratory, only those bugs directly implicated in a human exposure will be tested. This free service is provided to Texas residents only. For more information about submitting a bug for testing, please see <http://www.dshs.state.tx.us/idcu/health/zoonosis/Triatominae/>.

Additional Resources

For additional information about Chagas disease in Texas, please contact the DSHS Zoonosis Control program at 512-776-7255 or visit the program’s Chagas disease webpage, listed below. More detailed information about Chagas disease may be found on the following websites:

DSHS website: <http://www.dshs.state.tx.us/idcu/disease/chagas/>

CDC website: <http://www.cdc.gov/parasites/chagas/>

Kissing Bugs and Chagas Disease in the U.S.: <http://kissingbug.tamu.edu/>

Pan American Health Organization website:

http://www.paho.org/hq/index.php?option=com_topics&view=article&id=10&Itemid=40743

Continuing Medical Education (CME)

Chagas disease CME is available via an online course offered on the CDC Chagas disease website at http://www.cdc.gov/parasites/education_training/index.html.