THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN ACADEMY OF PEDIATRICS
AAP News

News Articles

Increased awareness of Chagas disease needed to improve patient outcomes

by Cassie Grimsley Ackerley M.D.; Larry K. Pickering M.D., FIDSA, FPIDS, FAAP

- Bennett C, et al. "Chagas Disease Surveillance Activities - Seven States, 2017." *MMWR Morb Mortal Wkly Rep.* 2018;67:738-741, http://bit.ly/2IuQTU2.

Chagas disease is caused by infection with *Trypanosoma cruzi*, a protozoan parasite endemic to Latin America where 8 million people are estimated to have the disease.

Most cases occur via transmission of *T. cruzi*from infected triatomine insects ("kissing bugs"), a type of reduviid. These insects defecate during or after a blood meal, and the parasite, passed in the feces, then enters the body through inoculation of the conjunctiva or through breaks in skin. Less common modes of transmission include ingestion of the insect or its feces, passage through blood transfusion or during organ transplantation from an infected donor, or congenitally through mother-to-child transmission.

Clinical manifestations occur as part of the acute or chronic phases of disease. The acute phase generally lasts eight to 12 weeks, during which time people typically are asymptomatic or have nonspecific influenza-like symptoms. Young children are more likely to develop significant manifestations during this phase, including fever, malaise, lymphadenopathy and hepatosplenomegaly. Rarely, acute myocarditis and/or meningoencephalitis can occur among the pediatric population, with the highest frequency involving congenital cases.

If transmission of the parasite involves the conjunctiva, Romaña's sign (see photo), unilateral edema of the eyelids, may be observed. The swelling is due to bug feces being rubbed into the eye or the bite wound occurring on the same side of the face. In some cases, a red, indurated nodule or "chagoma" will develop at the site of parasitic inoculation of the skin.

Without treatment, most people will remain chronically infected with no signs or symptoms of illness, although they are potential sources of disease transmission. Notably, 20% to 30% of chronically infected people will develop progressive sequelae of cardiac and/or gastrointestinal tract (GI) disease. Chagas cardiomyopathy characteristically involves conduction abnormalities, congestive heart failure and embolic events. GI manifestations are less common but may result in mega syndromes involving dilation of the esophagus and/or colon.

Diagnosis during the acute phase of disease requires identification of the parasite in the bloodstream through microscopic examination or through polymerase chain reaction (PCR) testing, which is available at the Centers for Disease Control and Prevention (CDC).

Due to low levels of parasitemia and suboptimal sensitivity of PCR (less than 50%) during the chronic phase, diagnosis depends on serologic assays to demonstrate the presence of Ig antibodies against *T. cruzi*. Detectable antibody concentration can be variable among people chronically infected with Chagas disease, and the serologic assays generally have low sensitivity and specificity. Therefore, no specific serologic assay is considered the gold standard. Positive test results with at least two serologic assay methods using different formats and antigen components are recommended to establish a diagnosis of chronic disease.

Recommended drugs for treatment can cause substantial adverse effects and require courses of at least 60 days, necessitating consultation with an infectious disease specialist or the CDC prior to initiating treatment. See the 2018 AAP *Red Book* for treatment options (http://bit.ly/2xONz1I).

THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN ACADEMY OF PEDIATRICS
AAP News

News Articles

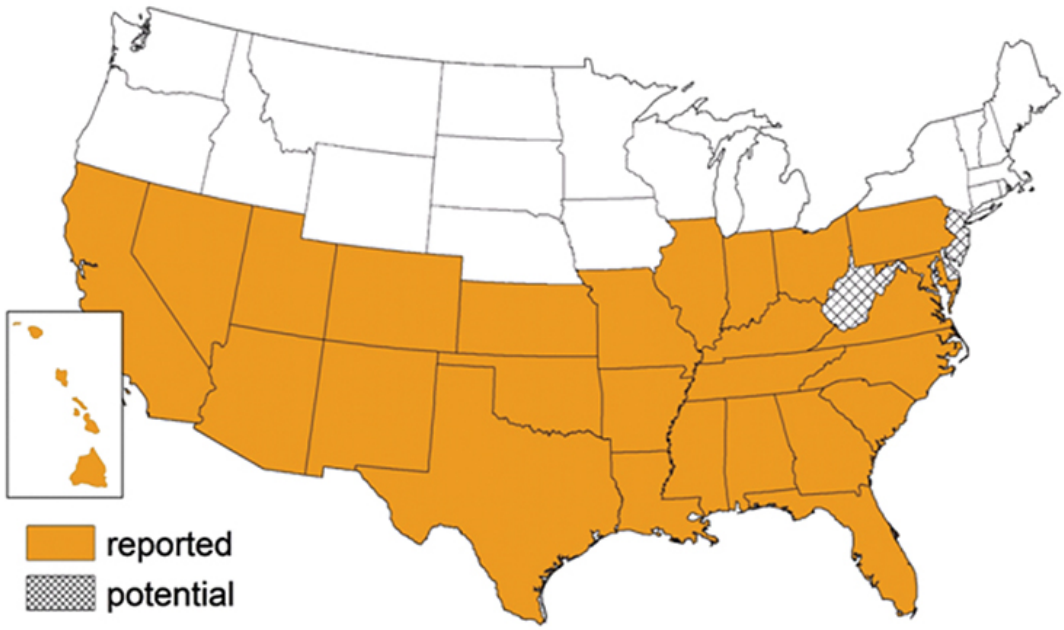
Public health implications in the U.S.

An estimated 8 million to 11 million people living in rural areas of Mexico, Central America and South America are infected with the disease. Limited data exist regarding disease prevalence and rates of transmission in the U.S. An estimated 300,000 people in the U.S. have Chagas disease; the majority have emigrated from areas with endemic infection. Based on these estimates, there is a 1% to 5% risk of congenital transmission, which correlates to 63 to 315 cases of congenital Chagas disease annually in the U.S.

Transmission through blood transfusion has occurred in at least 2,300 cases since reporting began in 2007, and there also have been cases of autochthonous transmission from infected triatomine bugs (also known as kissing bugs) living in the U.S.

Of the people who remain untreated with chronic disease, the sequelae of cardiac manifestations are estimated to occur in approximately 30,000 to 45,000 people. There is growing concern that Chagas disease is underdiagnosed due to limited screening and lack of recognition by health care providers, potentially impacting patient outcomes and increasing health care costs related to chronic disease manifestations.

The U.S. blood supply has been screened for Chagas disease since 2007, and seven states have implemented mandatory reporting. As of December 2017, six states - Arizona, Arkansas, Louisiana, Mississippi, Tennessee and Texas - have continued to conduct ongoing surveillance. Recent data analysis revealed that most reported cases are received by blood donor centers, yet notifications of potential cases also come from other laboratories and physicians.



Triatomine Bug Occurrence by State

Case investigations in Arizona, Louisiana, Mississippi and Texas focus on identification of local autochthonous vector-borne transmission, while health departments in Arkansas and Tennessee collect data on all modes of transmission. Although these states investigate reported cases of possible congenital transmission, no states conduct surveillance specifically for congenital infections.

These states, in conjunction with the CDC, provide guidance and education for physicians regarding the clinical

THE OFFICIAL NEWSMAGAZINE OF THE AMERICAN ACADEMY OF PEDIATRICS
AAP News

News Articles

management of Chagas disease. (See https://www.cdc.gov/parasites/chagas/index.html.)

While important, blood donor screening likely underestimates the burden of Chagas disease in the U.S., partly due to low rates of blood donation among foreign-born Latinos, who are more likely to be infected compared to non-Hispanic people.

Likewise, in the absence of routine prenatal or newborn screening for Chagas disease, the prevalence of congenital transmission remains unknown. Further investigation is warranted to determine the prevalence and distribution of Chagas disease among at-risk people, including women of childbearing age, to devise cost-effective strategies to implement screening programs and public health interventions.

Additionally, increased awareness and knowledge of this disease among health care providers will facilitate diagnosis and treatment of congenital, acute and chronic cases, thereby improving patient health outcomes and reducing the rate of ongoing disease transmission.

Question

Which of the following is/are a mode(s) of transmission for *Trypanosoma cruzi*?

a) Organ transplantation from an infected donor

b) Ingestion of an infected triatomine bug

c) Transfusion of infected blood products

d) Mother-to-child transmission

e) All of the above

Answer: e

Dr. Grimsley Ackerley is a post-graduate training fellow in adult and pediatric infectious diseases at Emory University School of Medicine and Children's Healthcare of Atlanta (CHOA). Dr. Pickering is adjunct professor of pediatrics at Emory University School of Medicine and CHOA.

Related Content

- Additional MMWR in Review columns