

Overview of american trypanosomiasis (chagas disease)



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Emerging infectious diseases, such as Chagas disease, are diseases that are difficult to control. They have caused an outbreak in the past two decades or they are a threat in the near future. These diseases are unpredictable and spread where they can, putting human and animal safety at risk (CDC, 2014a). Over time, the epidemiology of these diseases changes due to migration to different areas of the world. Education and prevention strategies are important in stopping the spread of disease.

History of American Trypanosomiasis

Over 100 million years ago, American Trypanosomiasis (Chagas disease), was thought to have traveled to South America by mammals. The earliest human case of this disease was found within a 9000 year old Chinchorro mummy. As the years passed, there were other human cases that went undiagnosed as Chagas disease, until 1909 when the disease was first discovered. Carlos Justiniano Chagas, a Brazilian hygienist and bacteriologist, conducted research which resulted in the first diagnosed human, a two-year old female who presented with fever, splenomegaly, hepatomegaly and inflamed lymph nodes(Steverding, 2014).

Description of Disease

Like most diseases, Chagas disease begins with an acute phase and can progress to chronic. The acute phase of the disease can last days, weeks or even months. Initially, the symptoms of the disease are mild or asymptomatic. These symptoms include fever, swelling of site, fatigue,

headache, nausea or vomiting. *Trypanosoma cruzi* can be found within in the blood during the acute phase. After the acute phase, the indeterminate period occurs and the infected person will typically become asymptomatic. Many people are unsuspecting of this asymptomatic period and believe they are without infection. If untreated, this disease becomes chronic and can cause life-threatening complications in 20-30% of infected individuals. (CDC, 2013). The chronically infected person can experience dysrhythmias, cardiomyopathy, or dilated esophagus or colon leading to difficulties with the GI system (CDC, 2013). To diagnosis acute Chagas disease, a sample of blood is tested for the *T. cruzi* parasite. If the disease is chronic, a serological test is run for antibodies (CDC, 2014b). The morbidity rate of Chagas disease is 63-315 infections per year in the United States (CDC, 2018). Worldwide, there is an estimated eight million infected people and more than 10, 000 die per year (WHO, n. d).

Transmission

Chagas disease is a vector-borne disease. The disease is transmitted through contact by the feces of an infected triatomine bug. The triatomine bug inherited the name “ the kissing bug” because of its blood-sucking ability. This bug preys on humans and animals. Commonly infected animals include domestic dogs and wild mammals. During the day, these bugs prefer to live in the walls or cracks of rural homes. At night, the bugs hunt and feed on human blood. Once they bite their host, they empty their bowels near the bite. The host becomes infected when the feces enters into the bloodstream via the bite. This route of transmission is the most common but, it is not the only route the infection can spread. These other routes include mother-to-
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baby during pregnancy or birth, contaminated blood products, organ transplant from infected donor, laboratory accidents or, rarely, contaminated food or drink (WHO, 2018).

Distribution Patterns of Disease

With the estimated eight million people infected worldwide, the United States has approximately 300, 000 infected individuals (Manne-Goehler et al., 2016).

According to Manne-Goehler et al., Oklahoma had an estimated 1, 407 cases and 17 confirmed cases from infected donated blood in 2013 (Manne-Goehler et al., 2016). As of 2018, seven counties in Oklahoma had a minimum of one infected bug test positive for *T. cruzi* (Oklahoma State University, 2018). Texas, Arkansas, Arizona, Louisiana, Mississippi and Tennessee, Oklahoma's neighboring states, have all started closely observing for Chagas disease since 2012 (CDC, 2018).

Populations Primarily Affected

Chagas disease can infect people of all ages. The populations that are primarily affected live in Mexico, Central American and South American countries. These countries provide a suitable living environment for the *T. cruzi* bug. The contributing factors include living in rural areas within poorly constructed homes and lack of prevention strategies due to low income or lack of supplies (CDC, 2018). In these countries, there are many locations that exist in low income, rural areas. This is particularly why the rates of Chagas disease are so high.

Prevention Strategies

Currently there is no immunization for Chagas disease. According to the Oklahoma State Department of Health, the prevention strategies are to sleep inside screened, air-conditioned rooms when traveling, use bug spray to avoid insect bites, wash and cook all food, avoid sleeping in mud homes and be aware that not all blood transfusions are screened for Chagas disease (OSDH, 2019). The best method of prevention, is to control the spread with early detection and treatment for infected patients. The World Health Organization (WHO) recommends spraying homes with insecticides, proper house renovations, maintaining a clean home, good hygiene, screening of blood and organ donors and testing children with infected mothers (2018).

Studies were conducted and the results found that the United States had 28 documented cases of Chagas disease from 1955-2015 (Montgomery et al., 2016). Throughout these studies, it was found that many of the infected individuals were immigrants who acquired the infection outside of the United States. In 2007, the United States began routine screening for all blood donors for *T. cruzi* infection after individuals had tested positive (Montgomery et al., 2016). Additional prevention strategies include raising awareness of Chagas disease to the public, providing screenings, lab testing, early detection and treatment of the disease (Montgomery et al., 2016). Applying bug spray when outdoors, researching information about countries before traveling and getting screened upon arriving into the United States are three personal prevention methods.

Internet Site

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The WHO website listed information about Chagas disease, the epidemiology, prevention strategies and additional informational resources. The information was updated, reliable and comparable with other resources. The data is clear and concise which allows for a better understanding of the information about Chagas disease. This website would be beneficial to other healthcare workers, as well as to the public.

Conclusion

Chagas disease is on the neglected parasitic infections list. This is based on infected individuals, severity of disease, ability of prevention and effective treatment methods (CDC, 2017). Additionally, the lack of awareness committed to this disease increases the risk of an outbreak to occur. Chagas disease has been around for many years and is easily spread between hosts. The infected and noninfected populations must become educated about prevention strategies to stop the growth of Chagas disease. This could decrease the number of cases each year and worldwide as well as save a life.

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