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### Chagas Disease: Immigrating into the United States

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# Chagas Disease: Immigrating into the United States

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## Introduction

Chagas Disease is starting to make a profound entrance into our communities within the United States. The influx of the immigrant population is the principal cause of the accumulation in the number of reported cases. (Center for Disease Control and Prevention, 2014).

The *Trypanosoma cruzi* is a parasite that causes Chagas disease. The triatomine blood sucking insect enjoys the mucosal membranes of their prey, both humans and animals. The most common regions of the penetrating bite are the conjunctiva of the eye or around the mouth. It is through the feces of the vector entering the inoculation site that initiates the parasitic life cycle.

## Overview Incidence

The disease is most prominent in Mexico and Central and South America, which has seen a total of 10 to 14 million cases.

However, incidence in the United States is increasing due to immigration of infected persons.

The congenital form occurs in approximately 1% to 10% of infants of infected mothers (with most cases being asymptomatic or showing nonspecific signs). (Mandal, 2014).

## Complications

- Cardiomyopathy
- Enlargement of the colon (megacolon)
- Enlargement of the esophagus (megaesophagus) with swallowing difficulty
- Heart disease
- Heart failure
- Malnutrition

It is estimated that there are over 300,000 people living in the United States who are infected with the parasite that causes Chagas disease. More than 300 infected babies are born every year in the United States. (CDC, 2014)

The primary concerns for the United States with this zoonotic disease is not the control of the vector itself, rather the spread from mother to infant, workplace laboratory mishaps, the transmission via blood donations and the instances of contracting via organ transplantation. Limited education has been provided to medical professionals in regards to this rural parasitic infection, thus making the diagnosis of Chagas Disease difficult.

It is this lack of education that must be modified to the United States physicians and nursing staff to enable prompt detection and early treatment options to the infected and possible contractors. Although Chagas disease has become a growing concern in the United States, many challenges remain to halt this disease's progression and improve management of chronically infected patients. (Chin, Arabov, & Mandel, 2013)

## Signs and Symptoms

Chagas disease has two phases: acute and chronic. The acute phase may have no symptoms or very mild symptoms. After the acute phase, the disease goes into remission. No other symptoms may appear for many years. (New York Times, 2015).

The clinical features of megaesophagus include chest pain, dysphagia, cough and regurgitation; hypersalivation, parotid enlargement and repeated aspiration may also occur, while constipation and abdominal pain are the typical symptoms of patients with megacolon, however, in patients with advanced megacolon, obstruction, perforation, and sepsis may develop.

The most serious and common manifestation of chronic *T. cruzi* infection is the chagasic cardiac disease, the earliest sign of which includes the conduction system abnormalities (right bundle branch block and left anterior hemiblock), and with the progression of the disease patients may develop atrial and ventricular arrhythmias, left ventricular dysfunction, thromboembolic events, dilated cardiomyopathy and congestive heart failure with a risk of sudden death.

Echocardiography with chronic chagasic heart patients reveals left ventricular dilatation and wall dysfunction, dyssynergic segments, ventricular aneurysm (apical or other), low ejection fraction (if <50 %) and valve disease, and dilatation and dysfunction of right ventricle (Mandal, 2014).

- No symptoms or very mild symptoms, including:
- Fever
  - Malaise
  - swelling of one eye
  - swollen red area at the site of the insect bite.
- Development of further symptoms, including:
- Constipation
  - digestive problems
  - pain in the abdomen
  - swallowing difficulties.

## Pathophysiological Processes Underlying Pathophysiology

Chagas disease, or American trypanosomiasis, is caused by the parasite *Trypanosoma cruzi*. Infection is most commonly acquired through contact with the feces of an infected triatomine bug (or "kissing bug"), a blood-sucking insect that feeds on humans and animals. (Center for Disease Control and Prevention, 2014). In the United States, the most common result of a triatomine bite is allergic reaction, including anaphylaxis, elicited in sensitized persons. (Stevens, Dorn, Hobson, de la Rua, Lucero, Klotz, & Klotz, 2012).

The life-cycle of the parasite represents four cellular forms characterized by the relative positions of the flagellum, kinetoplast and nucleus. The amastigotes built nests, by several cell divisions, within various tissue cells of human body, and release by rupture of the cells. The macrophages, which generally become attacked by the infective *T. cruzi* trypomastigotes, are recognized as one of the first cell types encountered by the parasite during natural infection, because of the fact of recognition of *T. cruzi* by macrophages through numerous Toll like receptors and lectin receptors; during initial replication, CD8<sup>+</sup> T cell infiltration become delayed facilitating parasite survival. (Mandal, 2014).

(Figure below: CDC, 2014)



## Significance of Pathophysiology

Diseases or illnesses that are underdiagnosed, untreated, and lack the education of healthcare professionals have always been of interest of mine. Not to mention the bugs that carry such diseases create an infatuation effect. With the increasing number of immigrants migrating to the US, the need for such education will become necessary to correctly diagnose and treat individuals with this infection. Educating nursing students and other seasoned nurses on material that is still a bit of an anathema to the healthcare profession, has ignited a curiosity. The rare, yet up and coming infection created from the triatomine insect may just be necessary to add to nursing and medical schools curricula in detail if the rise of Chagas Disease becomes more prevalent in the United States. Kuehn explains that given the increasing number of Chagas cases in the United States, attention has turned to local modes of transmission within the country. Triatomine bugs have roamed the United States for more than 100 years. They live in 28 states, mostly in the southern half of the country. (Kuehn, 2015).

## Transmission Cycle

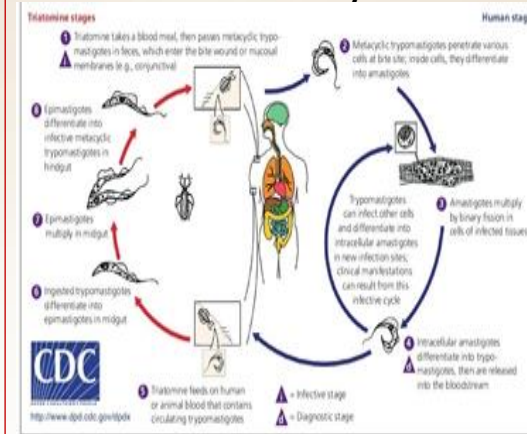


Figure 1. Transmission cycle of Chagas disease.

Adapted from Centers for Disease Control and Prevention. American trypanosomiasis (*Trypanosoma cruzi*). <http://www.cdc.gov/dpdx/trypanosomiasis/American/index.html>. Accessed February 4, 2014.

(CDC, 2014)

## Implications for Nursing

Nursing implications for patients with Chagas Disease, is first to be aware of and knowledgeable of the possibility that individuals in the US are presenting this disease. Following a diagnosis of Chagas Disease, a nurse would include the following in patient care:

- cardiac monitoring
- health history interview and physical assessment,
- intake and output assessment
- neurologic assessment
- nutritional screening
- oral drug administration
- preparing a patient for cardiac surgery
- pulse assessment
- respiration assessment, venipuncture and
- weight measurement. (Quizlet, 2015).

## Conclusion

Limited resources have been devoted to better understanding the impact and burden of Chagas Disease in the United States. Physicians may not be familiar with these infections because their clinical presentation, diagnosis, and treatment are typically not emphasized during medical training. Even when Chagas disease is suspected, US physicians may not readily embrace the diagnosis. Some assume it's an illness they're unlikely to encounter while others may fail to provide follow-up and treatment. Physicians in the United States aren't well-schooled in diagnosis and treatment, because medical education devotes limited time to parasitic diseases in general. (Kuehn, 2015). However, it is crucial for family physicians to understand the basic principles of diagnosis and treatment of these diseases. (Woodhall, Cantey, Wilkins, & Montgomery, 2014) As well as nurse practitioners and nursing staff.

## References Cited

- Center for Disease Control and Prevention. (2014, July). *Neglected Parasitic Infections (NPIs) in the United States: Chagas Disease*. Retrieved from <http://www.cdc.gov/parasites/npi/index.html>
- Chagas disease is an illness spread by insects. It is common in South and Central America. (2015, July 8) New York Times. Retrieved from <http://www.nytimes.com/health/guides/disease/chagas-disease/overview.html>
- Klein, N., Hurwitz, I., Durvasula, R., (2012). "Globalization of Chagas Disease: A Growing Concern in Nonendemic Countries," *Epidemiology Research International*. doi:10.1155/2012/136793
- Kuehn, B. M. (2015). Putting Chagas disease on the US radar screen. *JAMA: Journal Of The American Medical Association*, 313(12), 1195-1197. doi:10.1001/jama.2015.1867
- Mandal, S., (2014). Epidemiological Aspects of Chagas Disease - a Review. *Journal of Ancient Diseases & Preventive Remedies*. 2:117. doi: 10.4172/2329-8731.1000117
- Pathogen Profile Dictionary, (2010) *Trypanosoma cruzi*. Retrieved from <http://www.ppdictionary.com/parasites/cruzi.htm>
- Stevens, L., Dorn, P., Hobson, J., de la Rua, N., Lucero, D., Klotz, J., & ... Klotz, S. (2012). Vector blood meals and Chagas disease transmission potential, United States. *Emerging Infectious Diseases*, 18(4), 646-649. doi:10.3201/eid1804.111396
- Woodhall, D., Jones, J. L., Cantey, P. T., Wilkins, P. P., & Montgomery, S. P. (2014). Neglected parasitic infections: what every family physician needs to know. *American Family Physician*, 89(10), 803-811.
- Quizlet. (2015). Chagas Disease. Retrieved from <https://quizlet.com/21768766/chagas-disease-flash-cards/>
- Chin, E., Arabov, Y., & Mandel, E. (2013). A guide for screening, diagnosing, and managing Chagas disease in the United States. *JAAPA: Journal Of The American Academy Of Physician Assistants (Lippincott Williams & Wilkins)*, 26(9), 16-22. doi:10.1097/01.JAA.0000433834.11889.7C
- Souza, S., Cruz, V., Costa, A., Dias, F., daCosta, S., Carvalho, L., (2011). Nursing Process Applied to a Patient with Dilated Cardiomyopathy Associated with Chagas Disease. 7th. Virtual Congress of Cardiology. Retrieved from <http://www.fac.org.ar/7cvc/flave/t108i/t108i.pdf>

## Additional Resources

