Chagas Cardiomyopathy
Clinical Presentation and Management in the Americas

Catherine Pastorius Benziger, MD[a],
Gabriel Assis Lopes do Carmo, MD, PhD[b],
Antonio Luiz Pinho Ribeiro, MD, PhD[c,*]

KEYWORDS

• Chagas disease • Neglected diseases • Cardiomyopathy • Epidemiology • Trypanocidal agents

KEY POINTS

- The diagnosis and treatment of Chagas disease require specific knowledge about the acute and chronic forms of the disease.
- The initial Chagas infection is typically asymptomatic but after a decade or longer, approximately 30% of people will progress to a chronic cardiac form of Chagas cardiomyopathy with symptoms including heart failure, arrhythmias, and thromboembolism.
- Death is often premature and sudden due to arrhythmias or progressive heart failure.
- Prevention of infection through vector control programs, along with strengthened surveillance systems and rapid information sharing, are key to addressing the continued challenges of Chagas disease control globally.

Individuals, not rarely, die in their youth with an apparently healthy condition and no signs of heart disease. Many of them die while in their job, without any reasonable explanation; others die in a moment of greater physical effort, fatigue or any incident capable of exhausting the energy of the poor myocardium.

—Carlos Chagas, 1922.

INTRODUCTION

Chagas disease (American Trypanosomiasis) was first described by Carlos Chagas in 1909 during a Malaria outbreak in Lassance, State of Minas Gerais, Brazil. In his first report, he identified the etiologic agent, the parasite *Trypanosoma cruzi*, the triatomine insect vector, as well as the disease cycle, a unique discovery by one individual in the history of medicine.[1] Starting in the sixteenth century, increased anthropomotic pressure due to agricultural and livestock activities transformed the natural environment and created transport of vectors and zoonotic foci and spread of infection. By the early twentieth century, Chagas disease was a rural and periurban neglected tropical disease, closely related to poverty. However, due to mass rural-to-urban migration, and increased

Disclosures: The authors have nothing to disclose.

[a] Division of Cardiology, University of Washington, 1959 Northeast Pacific Street, Seattle, WA 98195, USA; [b] Hospital das Clínicas and School of Medicine, Universidade Federal de Minas Gerais, Av. Prof. Alfredo Balena, 190 - sala 246, Belo Horizonte Cep:30130-100, Minas Gerais, Brazil; [c] Division of Hospital das Clínicas and School of Medicine, Department of Internal Medicine and Cardiology, Universidade Federal de Minas Gerais, Rua Campanha, 98/101, Carmo, Belo Horizonte, Cep:30310-770, Minas Gerais, Brazil

* Corresponding author. Hospital das Clinicas and School of Medicine, UFMG, Rua Campanha, 98/101, Carmo, Belo Horizonte, Minas Gerais, Brazil.

E-mail address: alpr1963br@gmail.com

Cardiol Clin 35 (2017) 31–47
http://dx.doi.org/10.1016/j.ccl.2016.08.013

urbanization and intercontinental population movement, Chagas disease has recently gained attention due to the "globalization" of the disease.[2–5]

Chronic Chagas cardiomyopathy is the leading cause of nonischemic cardiomyopathy in Latin America and affects 20% to 40% of infected patients. The most ominous manifestations of the disease are related to heart failure, arrhythmias, heart blocks, and thromboembolism. In this article, we review the epidemiology, pathogenesis, presentation, and clinical management of Chagas disease.

EPIDEMIOLOGY

Chagas disease is a disease of poverty. It is on the World Health Organization's (WHO) list of 17 neglected tropical diseases because it shares similar characteristics, such as particular geographic dispersion affecting populations with poor socioeconomic status; high morbidity and consequent mortality with significant socioeconomic impact; biomedical and psychosocial barriers to diagnosis, treatment, and control; and limited availability of resources and political priority. It is endemic to continental Latin America because it is primarily transmitted through bites from the nocturnal "kissing bug," insects from the family Reduviidae, subfamily Triatominae, which is found in the region (**Fig. 1**). The vector defecates after sucking blood at night and the infection is transmitted through the parasite-contaminated feces/urine through a break in the skin, mouth, or eye. It has no gender predominance but local variations exist depending on different routes of transmission. *T cruzi* also can be transmitted through blood transfusions, organ transplantation, laboratory accidents, and vertical transmission during childbirth. More recently, oral (foodborne) transmission has emerged as a new route in the Amazon region, where areas that were not considered endemic had outbreaks of acute Chagas disease. Epidemiologic studies suggest that oral transmission was responsible, likely due to local foods that were infected by feces of triatomine bugs, which subsequently infected the oral mucosa of the new reservoir hosts.[6]

The prevalence of the disease has been decreasing in the past decades, mostly due to successful vector and blood transfusion control programs in several Latin American countries.[7] These programs include systematic spraying with residual insecticide, house improvements, home hygiene, blood donor screening and information, education, and community activities to increase awareness. In 1985, the WHO estimated almost 18 million people were infected,[8,9] but in the updated 2015 WHO report, an estimated 5.7 million people were infected in 21 Latin American countries.[10] The Pan American Health Organization's country-level seroprevalence estimates for 2005 range from less than 1 per 10,000 (0.01%) in Panama to nearly 7% in Bolivia. The areas with the highest prevalence (up to 30% in certain

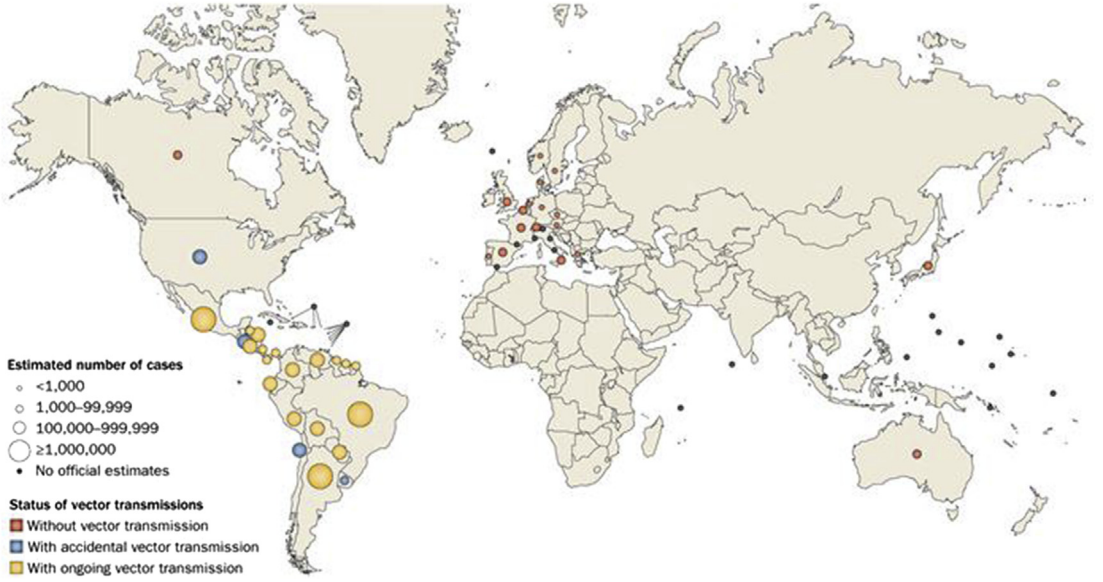

Fig. 1. WHO estimates of vector transmission between 2006 and 2009 of *Trypanosoma cruzi*. (*From* Ribeiro AL, Nunes MP, Teixeira MM, et al. Diagnosis and management of Chagas disease and cardiomyopathy. Nat Rev Cardiol 2012;9(10):578; with permission.)