Arch Clin Infect Dis. 2017 July; 12(3):e12504. doi: 10.5812/archcid.12504.

Published online 2017 July 31. **Case Report**

Patients with *Chagas* Disease and Cardiac Arrest Treated at the Emergency Department of a Reference Hospital in Brazil

Rodrigo Luiz Vancini,[1] Cassia Regina Vancini-Campanharo,[2] Marilia Santos Andrade,[3] Aecio Flavio Teixeira de Gois,[4] and Claudio Andre Barbosa de Lira[5,*]

[1]Centro de Educacao Fisica e Desportos (CEFD), Universidade Federal do Espirito Santo (UFES), Espirito Santo (ES), Brasil
[2]Escola Paulista de Enfermagem, Universidade Federal de Sao Paulo (UNIFESP), Sao Paulo (SP), Brasil
[3]Departamento de Fisiologia, Universidade Federal de Sao Paulo, Sao Paulo (SP), Brasil
[4]Escola Paulista de Medicina, Universidade Federal de Sao Paulo (UNIFESP), Sao Paulo (SP), Brasil
[5]Setor de Fisiologia Humana e do Exercicio, Universidade Federal de Goias (UFG), Goiania (GO), Brasil

[*]*Corresponding author*: Claudio Andre Barbosa de Lira, Universidade Federal de Goias, Campus Samambaia, Goiania, Goias, Brasil. E-mail: andre.claudio@gmail.com

Received 2017 May 03; **Accepted** 2017 June 18.

Abstract

People with *Chagas* disease are at a higher risk of death due to cardiac arrest (CA). Considering that *Chagas* disease remains a serious health problem in Latin America, studies in this regard are still needed. The aim of this study was to present 2 patients with *Chagas* that developed CA and were treated at the emergency department of a reference hospital in Brazil (Sao Paulo city). Case one: Male (73 years old and Caucasian) with a history of systemic arterial hypertension, diabetes mellitus, liver cirrhosis, and *Chagas* disease associated with megacolon and megaesophagus. After cardiac collapse and 30 minutes of cardiopulmonary resuscitation (CPR), unfortunately the patient died. Case two: A female patient (64 years old and Caucasian), with a history of systemic arterial hypertension, obesity, and *Chagas* disease. After 23 days of hospitalization, pharmacological therapy, and implantation of a cardioverter defibrillator, the patient was discharged. People with *Chagas* disease are at a higher risk of CA. The researchers believe that a prompt and efficient treatment (advanced life support) allied with educational programs on CA recognition targeted at health professionals and caregivers (basic life support knowledge) could improve the prognoses of these patients.

Keywords: Cardiac Arrest, Sudden Death, Tropical Disease, Basic Life Support, *Chagas*

1. Introduction

Chagas disease is caused by the protozoan parasite *Trypanosoma cruzi*. The main form of transmission occurs by contact of damaged skin and mucous membranes with feces contaminated with insect vectors (1). The epidemiological profile of the disease has changed due to urbanization and globalization, and has currently placed non-endemic countries at risk because of immigration of infected individuals to developed countries, mainly Europe and North America (2, 3).

Approximately 95% of acute cases of *Chagas* disease are asymptomatic. The remaining symptomatic cases present fever, malaise, muscle, joint pains, somnolence, cramps, diarrhea, edema, respiratory disturbances, cyanosis, and comma (4). Acute cases (with or without symptoms) of infection lead to chronic illness, while 66% of people with chronic infection do not show any detectable clinical manifestation. However, 33% of the chronically infected human population develops clinical manifestations of *Chagas* disease (4, 5). These chronic clinical manifestations affect the heart in 94.5% of cases.

Previous studies have shown that patients with *Chagas* disease are at a higher risk of death by sudden cardiac death when compared with the general population (6, 7), especially due to cardiac arrest (CA). Braggion-Santos et al. (6) conducted a study that evaluated 4501 autopsies and found that 5.5% (n = 49) of patients that suffered sudden cardiac death had *Chagas* disease.

Considering that *Chagas* disease remains a serious health problem in Latin America and others tropical regions, it is important to investigate and report these cases. The aim of this study was to present 2 patients with *Chagas* diseases, which presented CA, and were treated at the emergency department of a reference hospital in Brazil. The patients were extracted from a sample of a prospective study (performed from February 2011 to January 2012), previously published by the research group (8).

2. Case Presentation

2.1. Case One

Male patient: (73-year-old and Caucasian) with a history of systemic arterial hypertension, diabetes mellitus, liver cirrhosis, and *Chagas* disease associated with megacolon and megaesophagus. He used an enteric catheter and was moderately dependent for daily-life activities and was admitted to the emergency department presenting breath discomfort and apathy. He was diagnosed with hypoactive delirium. After 5 days of hospitalization and treatment with antibiotics, he experienced CA. The patient was observed by a health team, who attributed the CA to respiratory insufficiency with initial asystole rhythm. Ventilations, external chest compressions, tracheal intubation, multi-parametric monitoring, venous access puncture, administration of epinephrine, and defibrillation were performed. The time between cardiac collapse and onset of cardiopulmonary resuscitation (CPR) maneuvers was 1 minute, the first shock was performed 4 minutes after the cardiac collapse, tracheal intubation was performed 6 minutes after the cardiac collapse, and the first dose of epinephrine was administered 1 minute after the cardiac collapse; CPR lasted 30 minutes. The patient died due to acute respiratory failure.

2.2. Case Two

Female patient: 64 years old and Caucasian with a history of systemic arterial hypertension, obesity, and *Chagas* disease. Independent for daily-life activities. She was admitted to the emergency department due to fainting followed by palpitations and was diagnosed with atrial fibrillation with high ventricular response and submitted to synchronized electrical cardioversion. However, during the procedure, the patient developed CA. Ventilation, external chest compressions, defibrillation, tracheal intubation, and multi-parametric monitoring were performed. The time between cardiac collapse and onset of CPR maneuvers was 2 minutes, the first shock was applied 5 minutes after cardiac collapse, and a tracheal intubation was performed 7 minutes after cardiac collapse; the CPR lasted 7 minutes. The patient returned to spontaneous circulation, and developed three more CA, all with an initial rhythm of ventricular fibrillation, yet reverted after the first shock. The diagnosis during 23 days of hospitalization was cardiogenesis followed by septic shock. The patient was treated with cardiotonic agents and antibiotics, and was later discharged without neurological alterations, after an implantation of a cardioverter defibrillator.

3. Discussion

Chagas disease is an infectious condition, which effects approximately 6 to 7 million people worldwide. Most of these cases live in Latin America (9). Heart is affected in 94.5% of symptomatic patients and these patients are considered to have chronic *Chagas* heart disease. Heart insufficiency is associated with the cause of death cause in 58% of the patients, whereas arrhythmias have been associated with unexpected deaths in 36.5% of the patients (particularly due to CA). The other 4.5% of patients with chronic *Chagas* infection show mega syndromes, especially in gastrointestinal tract, a disease state that involves the enlargement of esophagus (mega-esophagus) and the colon (megacolon) (4, 10).

Furthermore, CA could be defined as abrupt loss of heart function in a person, who may or may not have been diagnosed with heart disease (11, 12). Vancini-Campanharo et al. (8) conducted a study to characterize patients, who had suffered CA, and to identify factors related to their mortality. In this study, 285 patients (66.3 ± 17.2 years) were followed for 1 year after treatment for CA. Respiratory failure was the most common presumed immediate cause of death (30.8%), while pulseless electrical activity was the most frequent initial rhythm (58.7%). The authors concluded that the mortality rate among CA patients was high (95.4%) and that the variable that best explained mortality was the initial CA rhythm.

Even though both patients presented alterations of their initial cardiac rhythm only the male died. The researchers believe that the female survived CA because she was younger and had a better clinical condition than the male patient (i.e. independence to perform daily-life activities).

The male subject presented diabetes mellitus, liver cirrhosis, megacolon, and megaesophagus. These clinical conditions confirm a more deteriorated health. The digestive form of *Chagas* disease, presented by the male, may effect all organs in the gastrointestinal tract, especially esophagus and large intestine resulting in megaesophagus and megacolon, respectively. It is worth mentioning that 65% of patients present megaesophagus, megacolon, and heart disease, simultaneously.

The female patient presented atrial fibrillation. Atrial fibrillation was the most frequently observed sustained supraventricular arrhythmia in chronic manifestation of *Chagas* disease; it is found in 4% to 12% of cases (13). It tends to manifests later on and is often associated with a marked cardiomegaly.

Both patients presented alteration in ventricular function. Bestetti and Cardinalli-Neto (7) pointed that patients with *Chagas* disease and ventricular tachyarrhythmias are

at a higher risk of sudden cardiac death. These patients should undergo primary and secondary prevention programs, such as programmed ventricular stimulation, implantable cardioverter defibrillator, amiodarone therapy, and catheter ablation.

Despite of the decrease in infected people and death cases, *Chagas* disease is still prevalent in Latin America; the disease morbidity and mortality is still higher than it should be. Unfortunately, *Chagas* continues to be relatively ignored by the society and it is generally neglected by government authorities. Governments, especially in Latin America, need to give higher priority to this health issue. It is also necessary to mobilize resources and capabilities from different society sectors, such as non-governmental and private organizations to combat and prevent this disease (14).

In addition, educational programs for CA recognition (despite that the frequency of treated and attended patients, at an emergency department, have been low) targeted at health professionals and caregivers could improve the prognoses of individuals already infected with *Chagas* disease. It is also advisable to educate the general public on CA recognition since this knowledge may increase the chances of survival before the arrival of advanced life support.

Footnote

Financial Disclosure: The authors report no real or perceived vested interests that are related to this article that could be construed as a conflict of interest.

References

1. Rassi AJ, Rassi A, Marin-Neto JA. Chagas disease. *Lancet.* 2010;**375**(9723):1388–402. doi: 10.1016/S0140-6736(10)60061-X. [PubMed: 20399979].
2. Nunes MC, Dones W, Morillo CA, Encina JJ, Ribeiro AL, Council on Chagas Disease of the Interamerican Society of C. Chagas disease: an overview of clinical and epidemiological aspects. *J Am Coll Cardiol.* 2013;**62**(9):767–76. doi: 10.1016/j.jacc.2013.05.046. [PubMed: 23770163].
3. Ribeiro AL, Nunes MP, Teixeira MM, Rocha MO. Diagnosis and management of Chagas disease and cardiomyopathy. *Nat Rev Cardiol.* 2012;**9**(10):576–89. doi: 10.1038/nrcardio.2012.109. [PubMed: 22847166].
4. Teixeira AR, Nitz N, Guimaro MC, Gomes C, Santos-Buch CA. Chagas disease. *Postgrad Med J.* 2006;**82**(974):788–98. doi: 10.1136/pgmj.2006.047357. [PubMed: 17148699].
5. Prata A. Chagas' disease. *Infect Dis Clin North Am.* 1994;**8**(1):61–76. [PubMed: 8021449].
6. Braggion-Santos MF, Volpe GJ, Pazin-Filho A, Maciel BC, Marin-Neto JA, Schmidt A. Sudden cardiac death in Brazil: a community-based autopsy series (2006-2010). *Arq Bras Cardiol.* 2015;**104**(2):120–7. doi: 10.5935/abc.20140178. [PubMed: 25424162].
7. Bestetti RB, Cardinalli-Neto A. Sudden cardiac death in Chagas' heart disease in the contemporary era. *Int J Cardiol.* 2008;**131**(1):9–17. doi: 10.1016/j.ijcard.2008.05.024. [PubMed: 18692919].
8. Vancini-Campanharo CR, Vancini RL, de Lira CA, Andrade MD, Lopes MC, Okuno MF, et al. Characterization of cardiac arrest in the emergency department of a Brazilian University Reference Hospital: A prospective study. *Indian J Med Res.* 2016;**144**(4):552–9. doi: 10.4103/0971-5916.200898. [PubMed: 28256463].
9. World Health Organization (WHO) . Chagas disease (American trypanosomiasis) Geneva: World Health Organization; 2015. Available from: http://www.who.int/mediacentre/factsheets/fs340/en/.
10. Meneghelli UG, de Godoy RA, Macedo JF, de Oliveira RB, Troncon LE, Dantas RO. Basal motility of dilated and non-dilated sigmoid colon and rectum in Chagas' disease. *Arq Gastroenterol.* 1982;**19**(3):127–32. [PubMed: 6821025].
11. Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics–2013 update: a report from the American Heart Association. *Circulation.* 2013;**127**(1):e6–e245. doi: 10.1161/CIR.0b013e31828124ad. [PubMed: 23239837].
12. Berg RA, Hemphill R, Abella BS, Aufderheide TP, Cave DM, Hazinski MF, et al. Part 5: adult basic life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2010;**122**(18 Suppl 3):S685–705. doi: 10.1161/CIRCULATIONAHA.110.970939. [PubMed: 20956221].
13. Garzon SA, Lorga AM, Nicolau JC. Electrocardiography in Chagas' heart disease. *Sao Paulo Med J.* 1995;**113**(2):802–13. doi: 10.1590/S1516-31801995000200011. [PubMed: 8650480].
14. Dias JC, Ramos AJ, Gontijo ED, Luquetti A, Shikanai-Yasuda MA, Coura JR, et al. 2 nd Brazilian Consensus on Chagas Disease, 2015. *Rev Soc Bras Med Trop.* 2016;**49Suppl 1**(Suppl 1):3–60. doi: 10.1590/0037-8682-0505-2016. [PubMed: 27982292].