



MOUNT SINAI  
SCHOOL OF  
MEDICINE

# Prevalence of Chagas Disease in Latin-American Immigrants with Non-Ischemic Cardiomyopathy in New York City

Luciano Kapelusznik<sup>1</sup>, Deborah Varela<sup>1</sup>, Susan P. Montgomery<sup>4</sup>, Arti N. Shah<sup>2</sup>, Francis J. Steurer<sup>4</sup>, David Rubinstein<sup>2</sup>, Daniel Caplivski<sup>1</sup>, Sean P. Pinney<sup>3</sup>, Stephanie H. Factor<sup>1</sup>

<sup>1</sup>Division of Infectious Diseases, Mount Sinai School of Medicine, New York, NY USA <sup>2</sup>Division of Cardiology, Elmhurst Hospital Center, Elmhurst, NY USA <sup>3</sup>Division of Cardiology, Mount Sinai School of Medicine, New York, NY USA <sup>4</sup>Division of Parasitic Diseases and Malaria, Center for Global Health, Centers for Disease Control and Prevention, Atlanta, GA



MOUNT SINAI  
SCHOOL OF  
MEDICINE

## ABSTRACT

### Background

Because Chagas disease cardiomyopathy (CM), the leading cause of CM in Latin America, occurs 10 - 30 years after infection, infected immigrants may develop CM while living in non-endemic countries. Anti-parasitic treatment is recommended for infected persons, < 50 years, before congestive heart failure (CHF) occurs. A cross-sectional study of Latin American-born adults with symptomatic non-ischemic CM was done to determine the prevalence of Chagas disease. While it is unclear if anti-parasitic therapy would benefit the participants, documenting Chagas would demonstrate the need for earlier screening.

### Methods

Patients with non-ischemic CM were recruited from Mount Sinai Medical Center's and Elmhurst Hospital Center's cardiology clinics. Ischemic cardiac disease was diagnosed in patients with a positive cardiac angiogram, positive stress test, or history of coronary artery bypass, cardiac stent, or myocardial infarction. Non-ischemic CM was diagnosed in patients without ischemic disease who had an ejection fraction (EF) < 50%. Consented participants completed a structured questionnaire. Blood was sent to CDC for *Trypanosoma cruzi* (*T. cruzi*) antibody testing by enzyme immunoassay, indirect immunofluorescence, and, when these tests were discordant, immunoblot analysis of trypomastigote excreted-secreted antigens. Chagas disease was diagnosed with 2 positive tests.

### Results

The 38 participants were 30 - 94 years, 66% men and from 12 Latin American countries. The 13% (5/38) diagnosed with Chagas were 51 - 73 years, 80% men, and from 5 Latin American countries. Infected participants were more likely than uninfected participants to experience chest pain (p=0.02, Fisher's Exact), have a cardiac pacemaker (p=0.08, Fisher's Exact), have monomorphic premature ventricular contractions (PVCs) on EKG (p=0.04, Fisher's Exact) and answer 'yes' when asked if they had a Chagas-infected family member (p=0.01, Fisher's Exact). The two groups did not differ in blood pressure, EF, right bundle branch block, left anterior hemiblock or symptoms of CHF.

### Conclusions

Our data suggests that 13% of non-ischemic CM in Latin American immigrants is caused by Chagas disease, and therefore, may be preventable. Future research will determine if chest pain, PVCs on EKG or patient report of a Chagas-infected family member is helpful in identifying patients earlier in their disease who may benefit from anti-parasitic therapy.

## BACKGROUND

- Chagas disease
  - Leading cause of cardiomyopathy in Latin America.
  - 1/3 develop cardiomyopathy.
  - Cardiomyopathy occurs 10 - 20 years after infection.
- Infected Latin American immigrants may develop heart disease while living in non-endemic countries.

## OBJECTIVES

- To determine if cardiomyopathy due to Chagas disease is present in Latin American immigrants in New York City.

## METHODS

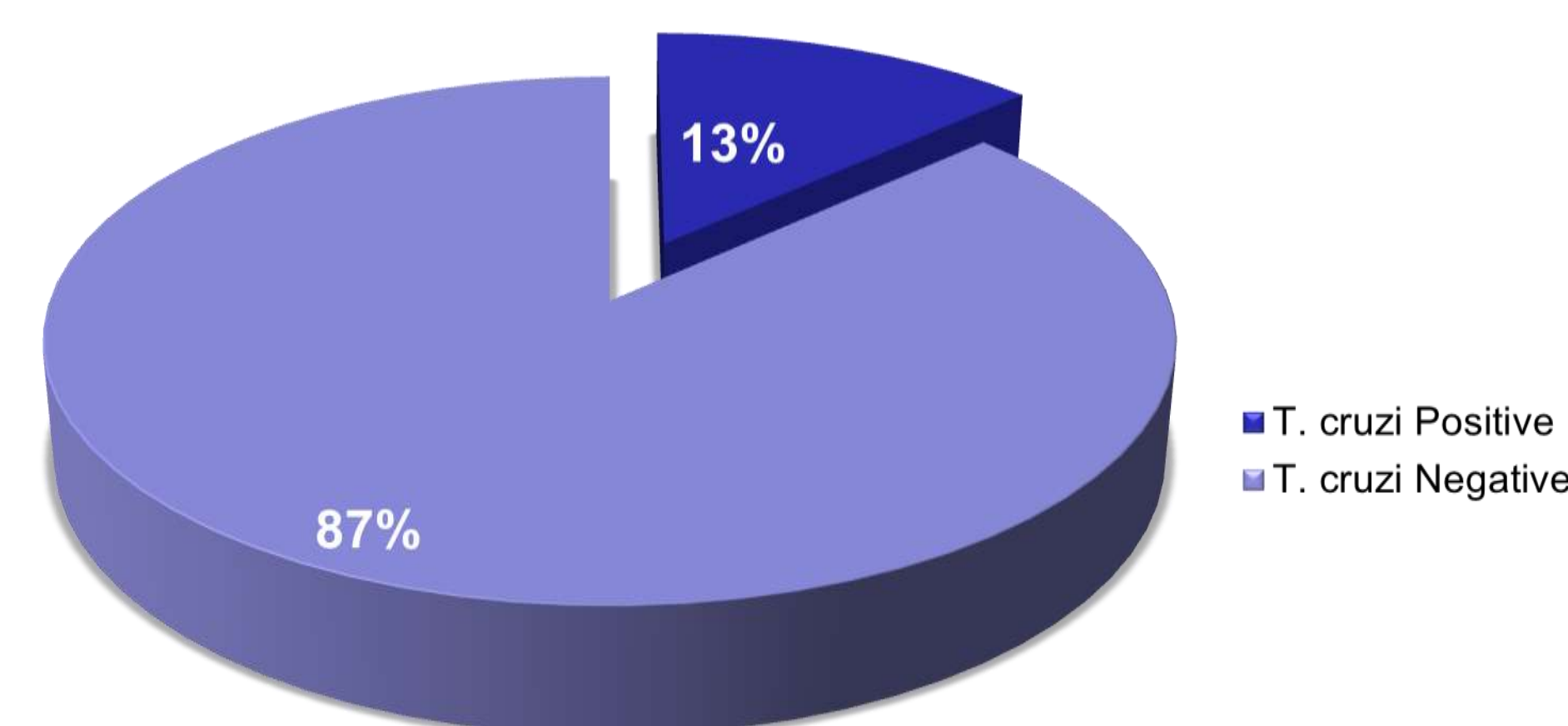
- Cross-sectional study of patients from Mount Sinai Medical Center's and Elmhurst Hospital Center's cardiology clinics
- Eligibility:
  - Born in continental Latin America.
  - Ejection fraction < 50%.
  - No evidence of ischemic heart disease.
    - No positive angiogram.
    - No positive stress test.
    - No coronary artery bypass surgery.
    - No cardiac stent placement.
    - No myocardial infarction.

## METHODS

- Self-administered questionnaire on demographics and medical history
- Chagas diagnosed with 2 of 3 positive tests:
  - T. cruzi* antibody by enzyme immunoassay.
  - T. cruzi* antibody by indirect immunofluorescence.
  - Immunoblot analysis of trypomastigote excreted-secreted antigens.

## RESULTS

### 13% of Participants with Non-Ischemic Cardiomyopathy had Chagas Disease



### Chest Pain, PVCs on EKG, Presence of a Pacemaker and Report of a Family Member with Chagas were Associated with Chagas Disease

	Chagas disease N=5(%)	No Chagas disease N=33(%)	p-value
Age [yr (mean, SD)]	66±9	62±14	0.48
<b>Sex</b>			
Male	4(80)	21(64)	0.64
Female	1(20)	12(36)	
Years in the U.S. (mean, SD)	23±14	27±13	0.57
Less than high school education	3(60)	8(26)	0.15
<b>History</b>			
Seen Reduviid bug before	3(60)	12(36)	0.36
Bitten by the Reduviid bug	2(40)	8(24)	0.59
Family member with Chagas	2(40)	0	0.01
Lived in a mud house	4(80)	17(52)	0.36
<b>Cardiac Symptoms</b>			
Presence of chest pain	4(80)	7(21)	0.02
Presence of shortness of breath	4(80)	20(61)	0.63
<b>EKG</b>			
QRS [msec (mean, SD)]	139±57	129±34	0.72
QTc [msec (mean, SD)]	465±31	462±36	0.87
Monomorphic PVCs	2(40)	1(3)	0.04
RBBB	2(40)	4(12)	0.17
LAFB	0	0	
Cardiac pacemaker	2(40)	2(6)	0.08
CXR with cardiothoracic ratio > 0.5	2(40)	12(36)	1.00
Systolic BP [mmHg (mean, SD)]	121±18	127±20	0.53
LVEF [% (mean, SD)]	33±10	37±9	0.46

## RESULTS

### Patients with Chagas Disease Were Born in 5 Countries



## CONCLUSIONS

- Our data suggests that 13% of non-ischemic CM in Latin American immigrants is caused by Chagas disease, and therefore, may be preventable.
- Future research will determine if chest pain, PVCs on EKG or patient report of a Chagas-infected family member is helpful in identifying patients earlier in their disease who may benefit from anti-parasitic therapy.

## REFERENCES

- Rassi A Jr, Rassi A, Marin-Neto JA. Chagas disease. Lancet. 2010 Apr 17;375(9723):1388-402.
- Roca C, Pinazo MJ, López-Chejade P et al. Chagas disease among the Latin American Adult Population Attending in a Primary Care Center in Barcelona, Spain. PLoS Negl Trop Dis. 2011 Apr 26;5(4):e1135
- Bern C, Montgomery SP, Herwaldt BL et al. Evaluation and treatment of Chagas disease in the United States: a systematic review. JAMA, 2007 Nov 14;298(18):2171-81.

## ACKNOWLEDGMENTS

- Global Health Center, Mount Sinai School of Medicine.
- Angela Rendo, Mount Sinai School of Medicine.
- Charles W. Todd, Centers for Disease Control and Prevention
- Barbara Calvano, Elmhurst Hospital Center