Chagas Disease in the United States

Chagas Disease in the Americas: Improving Access and Tools for Patient Diagnosis and Treatment

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History of *Trypanosoma cruzi* in the United States

- 1855 – Triatomine bugs identified in Georgia
- 1860’s / 70’s – Triatomines identified in six more states
- 1909 – Discovery of parasite and disease (Brazil)
- 1916 – Parasite first observed in California
- 1930’s – Reservoir host infections studied in U.S.
- 1955 – First autochthonous cases of Chagas disease reported
Who is at risk in the U.S.

- People who acquired the infection in endemic countries of Latin America
  - Estimated > 300,000 infected immigrants in U.S.*
  - Travelers to endemic areas
- People who acquire the infection in the United States
  - Exposed to infected vectors/ reservoirs
  - Children of infected mothers
  - Transplant recipients
  - Transfusion recipients
  - Laboratory staff working with vectors, reservoir species, or parasite

*Bern and Montgomery, CID 2009
23 million people in the U.S. born in Mexico, Central and South America

Source: Schmunis Mem Inst Osw Cruz 2007
States with documented potential *T. cruzi* vectors

~ 11 potential vector species in the U.S.
States with documented mammalian reservoirs

> 18 infected reservoir species identified

- **Green**: Reservoirs and vectors
- **Yellow**: Vectors only
Vector and Chagas disease in Texas*

Overall, 50% of tested bugs positive for *T. cruzi*

Female *Triatoma gerstaekeri*

Male *Triatoma sanguisuga*

Photo courtesy of Sonia Kjos

*Kjos et al. VBZD 2009*
Autochthonous transmission in the U.S.

- Sylvatic cycle below 40th parallel
- Seven autochthonous human cases published

<table>
<thead>
<tr>
<th>Year</th>
<th>State</th>
<th>Patient</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>Texas</td>
<td>infant</td>
<td>Acute</td>
</tr>
<tr>
<td>1955</td>
<td>Texas</td>
<td>infant</td>
<td>Acute</td>
</tr>
<tr>
<td>1982</td>
<td>California</td>
<td>56 yo woman</td>
<td>Acute</td>
</tr>
<tr>
<td>1983</td>
<td>Texas</td>
<td>infant</td>
<td>Acute</td>
</tr>
<tr>
<td>1998</td>
<td>Tennessee</td>
<td>infant</td>
<td>Acute</td>
</tr>
<tr>
<td>2006</td>
<td>Louisiana</td>
<td>74 yo woman</td>
<td>Chronic</td>
</tr>
<tr>
<td>2006</td>
<td>Texas</td>
<td>infant</td>
<td>Acute</td>
</tr>
</tbody>
</table>
States with human cases, mammalian reservoirs, and vectors

* Published human vector-associated cases

- **Reservoirs and vectors**
- **Vectors only**
Introduction of blood donation screening in the United States

• Five documented transfusion transmission cases in U.S.
• Most blood centers started screening early 2007
  – ~75 – 90 % of the blood supply currently screened
  – Screening and confirmatory tests are both expensive
• Positive donors are counseled to seek medical care
Test performance in first 16 months of screening*

- Jan 2007 – June 2008: > 14 million donations screened
- 1851 (~0.013 %) repeat reactives
- 519 / 1851 (28 %) confirmed by RIPA
- ~1:27,500 donors RIPA positive
  - ~1:3,800 South Florida
  - ~1:8,300 Southern California (previous studies deferred many donors)

*Bern et al. Curr Opin Infec Dis 2008
Confirmed positive blood donors
2007 – 2009*, n = 1,023

Donors mapped by
ZIP code of residence

*Source: AABB Biovigilance program, as of September 24, 2009
Transplant transmission in the U.S.

• Five published cases
  – 2001 cluster of 3 cases from same donor
    • Kidney/pancreas, kidney, liver recipients
  – 2006 heart transplant—other transplanted organ recipients negative
  – 2006 heart transplant—other transplanted organ recipients negative

• Other suspected cases investigated but no documented transmission

• Screening of donors and/or recipients is voluntary, handful of organ procurement organizations are screening
U.S. public health and Chagas disease

• Not nationally notifiable disease
  – Reportable only two states, AZ and MA

• No systematic public health surveillance

• Lack of public health testing capacity for Chagas disease
  – No testing available in state health department labs

• Many competing priorities at local, state, and federal levels of public health
Challenges for clinical management of U.S. Chagas disease patients

• Multidisciplinary approach needed
  – Infectious disease, cardiology, gastroenterology, OB/GYN, pediatrics, social services

• Physician lack of awareness
  – Documented by ACOG and MedscapeCME surveys
  – If the patient is not tested for Chagas, the infection is not identified
  – ‘Healthy’ infected may not seek care

• Treatment drugs are not FDA-approved
What CDC is doing

• International collaboration on
  – Congenital transmission, community epidemiology
  – Diagnostic test development and screening strategies
  – Clinical status and immunological responses
  – Treatment compliance and side effects monitoring
  – Vector ecology and reinfestation
What CDC is doing

• CDC supports small-scale U.S. studies of prevalence and disease
  – Provides epidemiological expertise
  – Provides lab support for studies

• CDC responds to inquiries from healthcare providers, public health professionals and the public

• Only source for treatment drug in the U.S.
Challenges

• Health education: How to increase the proportion of infected receiving appropriate care?
• How much morbidity is due to Chagas disease?
  – Cardiac disease burden
  – Gastrointestinal disease burden
• What is the risk of congenital transmission?
• What is the risk of autochthonous transmission?
CDC resources

- In English and Spanish at www.cdc.gov/chagas
  - Podcasts for health care providers
  - Fact sheets for healthcare providers and for the public
- Recommendations for evaluation and treatment of chronic Chagas disease in the United States JAMA 2007
- Parasitic Diseases Public Inquiries at (770) 488-7775, chagas@cdc.gov
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Dr. Carlos Chagas

The findings and conclusions in this presentation have not been formally disseminated by the Centers for Disease Control and Prevention and should not be construed to represent any agency determination or policy.