Chagas ECHO: Chronic Chagas: Insights from Cardiology

February 26 2020

Project ECHO/UT Health San Antonio
Agenda for today’s session

• Introductions

• Presentation by Dr. Rachel Marcus
  • Brief overview of Chagas Disease
    • Chagas Cardiomyopathy diagnostics and treatment

• Case Presentation and Discussion

• Conclusion
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Paula Stigler Granados, PhD, Rachel Marcus, MD Susan Montgomery, DVM Planning Committee Members

Thank you Sheba Meymandi!!!
Chagas Disease: Old School

• A parasitic infection causing heart and gastrointestinal damage, chiefly transmitted by reduviid bugs to a mammalian host

• Zoonosis: over 100 reservoirs known.

• Disease of rural poverty in non-island nations of Latin America:
  • domiciled nocturnal bug feeds on sleeping victims,
  • lives in cracks/crevices of poorly built houses/chicken coops.
AKA: Kissing Bug, Insecto asesino, Vinchuca, Chinche, Barbeiro, Chipo, Pito

- Intestine of triatomine is obligate part of parasite lifecycle.
Its gross, but this is how it gets the job done...
The parasite, Trypanosoma Cruzi, infects smooth muscle cells, autonomic nerve terminii.
Transmission 2.0

• Vector control has been very effective, though not complete, but with rural to urban migration:
  
  **Vertical transmission**: 1-10% of infected moms pass to infant
  
  **Blood transfusion**: 10% transmission rate if infected product, highest risk with platelets
  
  **Reactivation**: chemical or disease-induced immunosuppression, especially HIV
  
  **Oral**: consumption of unpasteurized juice with bug/fecal material.

  **Local transmission**: Uncommon (?) but does occur

• Regardless, remains a “neglected” disease of the poor.
Clinical Course: Acute Phase

- Non-specific symptoms in many, fever, malaise, adenopathy. Frequently not remembered as an adult. Lasts 6-8 wks.
- Romana’s sign (10%)
- 5% < clinically important presentation with myocarditis/meningoencephalitis which in 10% can be fatal.
- Parasitemia is present/treatment with antiparasitic medications effective for “cure” in 70-90%
Clinical Course: Indeterminate Phase

- Most untreated patients pass into this phase, no end organ manifestations

- Positive serology (2 forms) ELISAs/TESA

- End of significant manifestations of illness for 70-80% of patients, 2-5%/year progress.
Testing: Serologic diagnosis*

(*special exceptions: congenital/reactivation)

• Commercial lab testing is ELISA, and diagnosis should be made with positive IgG, not IgM

• Recent exposure: wait 8-10 weeks for IgG development

• Indeterminate/Chronic: IgG

• Confirm Confirm Confirm….did I mention Confirm???
Clinical Course: Chronic Phase

• Presents 15-30 years after time of likely infection

• 20-30% of patients progress, not clear who, although more men have significant cardiac impairment. Degree of parasitemia? Reinfection? Manual labor? Strain type? Genetic factors in immune response.

• GI manifestations in 10%, more common in South America
Chagas Cardiomyopathy: Heart Failure
CCC: Arrhythmia

- Bradyarrhythmias
- Tachyarrhythmias
CCC: Thromboembolism

- Strokes, systemic embolism
My patient is confirmed positive…What do I do now?

• 12 lead ECG and echocardiogram: if normal, consider antiparasitic treatment

• If abnormal, refer to cardiology, infectious disease, preferably someone who knows about Chagas!
ECG in Chagas Disease

<table>
<thead>
<tr>
<th>Electrocardiographic parameters</th>
<th>CD participants</th>
<th>Non-CD participants</th>
<th>p-value</th>
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<tr>
<td>RBBB plus LAFB</td>
<td>11 (50)</td>
<td>3 (5)</td>
<td>&lt;.001</td>
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<tr>
<td>LBBB</td>
<td>23 (10)</td>
<td>32 (61)</td>
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<td>QRS duration, ms</td>
<td>125 (27)</td>
<td>134 (39)</td>
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<tr>
<td>Atrial fibrillation</td>
<td>11 (5)</td>
<td>2 (3)</td>
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<tr>
<td>PVC</td>
<td>104 (46)</td>
<td>13 (21)</td>
<td>.002</td>
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<tr>
<td>Pacemaker</td>
<td>29 (13)</td>
<td>1 (2)</td>
<td>.013</td>
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<tr>
<td>QTc</td>
<td>455.4 (66.1)</td>
<td>473.9 (55.1)</td>
<td>.487</td>
</tr>
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</table>
CARDIOLOGY EVALUATION

• Echocardiogram: EF, WMA. Strain? Focus on apex!

• Holter: NSVT, brady

• Stress Test: chronotropic incompetence, ex. induced VT

• MRI: gadolinium uptake, risk stratification
Antiparasitic therapy

**Benznidazole**: 2 nitro-imidazole
- FDA approved
- 5-7mg/kg po in divided doses 60 days. (max dose @300mg/day)
- Rash/wt loss/HA/late polyneuropathy/LFTs/neutropenia
- 85% finish Rx
- Cannot use in pregnancy

**Nifurtimox**: 5-nitrofuran
- Not FDA approved
- 8-10mg/kg divided TID-QID po x 90 days
- Only 50% complete course
- Skin, GI, psychiatric
What’s the data for treatment?

• Seronegativization associated strongly with rx in children

• Observational data suggests significant decrease in risk of transplacental passage in women of childbearing age

• Prospective trial suggested decrease in risk of progression associated with rx, and medication does decrease PCR positivity with modest impact on seronegativization.

• BENEFIT trial...
Does Antiparasitic Therapy Help in CCC?  
BENEFIT Trial

2854 pts randomized to Benz vs placebo

Mean age 55, 74% NYHA I, 70% normal EF

5 year f/u (99.5%)
7 year f/u (75%)

Primary endpoint: CV
Secondary endpoint: PCR
So what can we do for a patient with CCC?

• GDMT

• Risk assessment: VT

• Risk assessment: thromboembolism

• Advanced heart failure therapies
Prognosis of CCC

Circ Heart Failure 2017;10 and Circ Heart Fail 2015;8:938-943

- Data suggest it is worse than other dilated/ischemic: 40% higher risk of death.

- In US study, death/tx in 36% vs. 10% at 36mo.
Algorithm for Diagnosis and Management
So who should we test in Cards Clinic?
(AKA: Shout out to Sheba Meymandi!)

• 13–19% of immigrants from endemic countries with nonischemic cardiomyopathy had Chagas as the cause of CHF.

• 5% of same with bundle branch blocks had Chagas, but 18% of patients with bifascicular block tested positive!

• 7.5% of immigrants with pacemakers had Chagas

• 7x higher risk of Chagas if a family member has disease!
And why should we test for Chagas in Cardiology Clinic?

• Dx matter for how we care for patient: VT, thromboembolic risk, and reactivation if transplanted

• If the patient is a woman, MUST test children

• All family should be screened
Case Presentation
A 56 year old man with new onset left sided weakness, slurred speech

• Born in El Salvador

• No other PMH

• Had brief episode of similar symptoms one week prior

• Found to have acute R MCA stroke on CT and multiple old infarcts, given IV TPA with excellent response.
ECG
2D echo: “Low normal EF, no obvious source of embolus”
Which of the following tests should be performed next?
Which of the following tests should be performed next?

• T Cruzi IgG

• Echo with contrast

• Hypercoagulability workup

• Implantable loop recorder
T Cruzi IgG sent….

• Takes about one week to come back

• Then confirmation takes another 1–2 weeks….

• And in this patient population that means LOST TO FOLLOW UP!
Echo with contrast:
Cardiac MRI
Take home points:

• 1) NO ONE thinks of Chagas, even when you tell them to.

• 2) Be very thorough in looking for apical disease!

• 3) Chagas patients with normal to mildly reduced EFs can still have catastrophic strokes and/or lethal arrhythmias.
Where to turn for help?

- [https://www.cdc.gov/parasites/chagas/health_professionals/index.html](https://www.cdc.gov/parasites/chagas/health_professionals/index.html)
- [uschagasnetwk@listsrv.ucsf.edu](mailto:uschagasnetwk@listsrv.ucsf.edu) US Chagas Disease Providers Network
Next Chagas Disease ECHO sessions

March 25 @ 12noon CST
Chagas for OB/GYN and Pediatrics: screening/diagnostics in pregnant women and newborns

April 29 @ 12 noon CST
Diagnosis and Treatment of Chagas from the Infectious Disease Specialists perspective