Jornadas Medicine

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DIV INFECTIOUS DISEASE AND GEOGRAPHIC MED
Outline

- Jornadas – Visits by volunteer clinicians usually from North America, Europe providing care to medically underserved Guatemalans

- Guatemala Demographics

- Sarstun Clinic

- Most common presenting symptoms
  - Musculoskeletal Pain
  - Abdominal Pain
  - Diarrhea
  - Cough
  - Skin complaints
Guatemala demographics

- Central America’s most populous country
- Size of Tennessee
- 16.6 million (2016 stats)
- 60% Mayan (indigenous) descent

- National poverty rate > 50%; extreme poverty 15%
- Per capita annual income: $7,500

- Inequalities affect indigenous, rural populations:
  - Average time in school among indigenous: **3.8yrs**
  - 75% of indigenous people live in poverty compared to 36% in non-indigenous
War and Poverty

- 1960-1996: brutal Civil War between government of Guatemala and leftist rebel groups supported chiefly by Mayan indigenous people and Ladino peasants, who together make up the rural poor.
- >200,000 killed over 36 year-long Civil War
  - 83% killed of Mayan descent
  - 93% of human rights violations carried out by State forces, military
- 1996: Peace accord brokered by UN

U.N.-backed Commission for Historical Clarification
“Guatemala: Memory of Silence”, 1999
Sarstun, Guatemala

- No-cash economy of subsistence fisherman and farmers

- Sarstun Clinic built beginning in 2003 with full-time construction worker

- All other labor provided by local residents

- In exchange, each resident received credits that allowed them to pre-pay for clinic services
-3 medicine exam rooms
-1 Ob-Gyn exam room
-1 Surgical suite w/ recovery
-Pharmacy
-Dormitory
Musculo-skeletal pain

- Aches and pains #1 clinical complaint
- Causal factors including:
  - excessive lifelong physical labor
  - malnutrition
- Whole Body Pain ("dolor de los huesos")
  - diffdx: osteoporosis, rheumatoid arthritis,
    osteomalacia (Vit D deficiency).
  - if associated w/ fever, malaria vs dengue vs zika
- Less likely to be psychogenic
Abdominal Pain: Epigastric

- 40% of all presentations (Chickering et al., J TransCultural Nursing, 2004)
- Gastritis
  - empiric treatment for *H pylori* (Chickering et al., J TransCultural Nursing, 2004)
  - high incidence of gastric cancer in similar populations (Halperin et al. (Lancet, 1988)

Intestinal worms ("trueno") de-worm quarterly w/ Albendazole 400mg po x 1 (WHO, 2002)

<table>
<thead>
<tr>
<th>Infections</th>
<th># of cases (in millions)</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ascaris (roundworm)</td>
<td>330</td>
<td>35%</td>
</tr>
<tr>
<td>Trichuris (whipworm)</td>
<td>233</td>
<td>25%</td>
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<tr>
<td>Necator</td>
<td>239</td>
<td>26%</td>
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<tr>
<td><em>Schistosoma aematabium</em></td>
<td>56 (Africa only)</td>
<td>33% (Africa only)</td>
</tr>
<tr>
<td><em>Schistosoma mansoni</em></td>
<td>25 (Africa only)</td>
<td>16% (Africa only)</td>
</tr>
</tbody>
</table>

Bundy et al., WHO and World Bank, 1997
<table>
<thead>
<tr>
<th>Symptom</th>
<th>Causation</th>
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</thead>
<tbody>
<tr>
<td>RUQ Pain</td>
<td>Worms in biliary tract Amoebic liver abscess</td>
</tr>
<tr>
<td>LUQ Pain</td>
<td>Malaria w/ splenomegaly Amoebic abscess L hepatic lobe</td>
</tr>
<tr>
<td>RLQ Pain</td>
<td>Worms causing appendicitis Ileo-cecal TB</td>
</tr>
<tr>
<td>Cramping Pain</td>
<td>Giardia</td>
</tr>
<tr>
<td>Generalized Pain</td>
<td>Malaria Typhoid</td>
</tr>
<tr>
<td>Obstruction</td>
<td>Ascaris in large numbers</td>
</tr>
</tbody>
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Adapted from Manson’s Tropical Diseases (2003)
What could possibly go wrong?

**Giardia lamblia** -- protozoan
- Symptoms usually appear 1-2 weeks after infection.
- Protozoa are shed through feces.

**Leptospirosis** -- gram-negative aerobic spirochete
- contact thru water (wet soil/vegetation) contaminated by animal urine
- high fever, HA, vomiting, jaundice, diarrhea
- can lead to renal/hepatic failure, meningitis, respiratory distress
- fatality case rate low; delayed treatment → prolonged recovery
- Rx: mild – doxy, ampicillin, amoxicillin
  severe – PCN-G, possibly 3rd/4th generation Cephalosporin

**Schistosomiasis*** -- parasitic trematode flatworm
- fresh water snails act as intermediate host and release larval form of parasite that penetrates the skin of people exposed to contaminated water
- worms mature and reproduce in the blood vessels, liver, kidneys, and intestines releasing eggs, which become trapped in tissues triggering an immune response
- may manifest as either urinary or intestinal disease
- *very low incidence Central America
What else could go wrong?

- **Free-living amoeba** (acanthamoeba, balamuthia, naeglaria)
  - Important causes for disease in humans, animals
    - *Naeglaria* produces an acute, usually lethal NS disease called primary amoebic mening-encephalitis
    - *Acanthamoeba* spp and *Balamuthia* cause a “granulomatous” amebic encephalitis in individuals with compromised immune systems
Diarrhea (asientos, chorrió)

- **Common** – patients will pound their fist from side to side over the abdomen to describe.

- **Rehydration** – most important consideration in infants/toddlers
  - **Oral Rehydration Solution** *(suero oral)*
    - 1L of boiled or bottled water
    - 8 tsps. sugar
    - 1 tsp salt
    - Pinch of baking soda *(bicarbonate)*
    - Squeezed orange or lemon juice *(to flavor and provide K+)*
    - “Should not taste saltier than tears”
  - **Ringer’s Lactate** for IV administration
Severe Diarrhea

- 6 or more episodes of watery stool/24hrs
- In children, “painful” defecation

- Low concern for Entero-hemorrhagic E coli (EHEC)
- Bloody diarrhea, febrile diarrhea, severe diarrhea should be treated as *shigellosis*, not amoebiasis
  - Moderate *Shigella* resistance to TMP-SMX
  - Adults: Rx with Ciprofloxacin
  - Children: Rx w/ Rifamixin or Ciprofloxacin
    (if mild symptoms, Rx with Azithromycin)

- Amoebiasis: chronically small, frequent stool w/ mucous or blood-flecked
  - *Entamoeba histolytica* in Guatemala responsible for only ~1% of cases of diarrhea
    (Instituto de Nutricion de Centroamerica y Panama, personal communication, July 2001)
  - Rx: tinadazole or short course of metronidazole
  - Cyst-passing state is not treated
Prolonged diarrhea

- **Giardia**: 14 days watery, crampy diarrhea
  - Rx: Metronidazole
- **Strongyloides** in children (tropical lowlands) w/ persistent diarrhea who have failed multiple treatments
- **HIV/AIDS**: if accompanied by weight loss, fever, sweats, rash, social history

1.6% of total population
2900 new HIV infections annually
1600 AIDS-related deaths cumulatively
46K PLWAs w/ 36% on anti-retrovirals
Among PLWA, 25% with undetectable viral loads
Among pregnant women w/ HIV, 19% on treatment

Key Populations:
- Sex workers (1.6%)
- MSM (8%)
- **Transgender (22.2%)**
- Prisoners (0.75%)

Adapted from 2016 UNAIDS
Diarrhea

Duration

<2 weeks
- NOT severe, febrile or bloody
- No Rx
- or Pepto-Bismol if vomiting

>2 weeks
- NOT severe, febrile or bloody: Rx for Giardia
- febrile and/or severe (tenesmus or >= 6 loose stools/24hrs)

Consider:
1) HIV if wgt loss, rash, cough, fever, etc
2) Strongyloides in children with h/o multiple prior treatments

Infants:
- IV or PO rehydration
- Rx: azithromycin, erythromycin or rifaximan

Children:
- IV or PO rehydration
- Rx: azithromycin or rifaximin; if more severe, ciprofloxacin

Adults:
- IV or PO rehydration
- Rx: ciprofloxacin or azithromycin

(Typhoid outbreak Peten Department) Aug2017, CDC

Bloody stools:
1) Add tinidazole (for ? amoebic hepatic abscess)
2) Ask about pig exposure – if yes, treat w/ high-dose mebendazole (Vermox)

Adapted from Chickering W. A Guide for Visiting Clinicians to Guatemala, J Transcultural Nursing, Fig 1, 2003
Acute cough

- Infectious
  - Viral URI
  - Sinusitis
  - Acute bronchitis
  - Whooping cough

- Non-infectious
  - Flare-up of chronic conditions
    - Chronic bronchitis
    - Emphysema
    - Asthma
  - Environmental allergies

Caveats for Guatemala

- "Verminous pneumonitis"
  - Allergic reaction to larvae migrating to lungs following aspiration of *Ascaris* eggs
  - Scenario: toddler with acute bronchospasm but not hx/of asthma
  - Rx: 2-3 wk course of steroids followed by Albendazole to kill mature larvae

Pulmonary Fibrosis from indoor stoves

- 77% of Guatemalan families use wood as main fuel source.
- Mayan women and children at highest risk for respiratory illnesses including ‘black lung’

Guatemala Stove Project
Chronic Cough

- **Pulmonary TB**
  - high index of suspicion when associated w/ fever, NS, weight loss
  - house-hold contact (family member who took PO meds for 12 months or injections 3x week (streptomycin)
  - beka (sputum sample)
  - Guatemala Health Department (national health system)
  - Partners: WHO, CDC, Stop TB-Partnership (Switzerland) and TB Reach (Canada)

- **WHO Global TB Control report (2015)**
  - 16,500 active TB cases (3369 reported thru the national health system)
    - 57/100,000 Estimated TB Incidence (2014)
    - 106/100,000 Estimated TB Prevalence (2014)
  - 9% of TB patients were screen-positive for HIV (2014)
Skin disorders

- Caused 24.4% of health problems leading medical disability in Guatemala (2016).

- Some common disorders cite:
  - T. cruzi
  - Cutaneous leishmaniasis
  - Zika/Dengue/Chikangunya
  - Leptospirosis
Chagas Disease

American trypanosomiasis, caused by parasite *Trypanosoma cruzi*. Infection commonly acquired through contact with feces of infected triatomine bug ("kissing bug"), a blood-sucking insect that feeds on humans and animals.

- **Acute Phase:**
  - few weeks to months → parasites found in the circulating blood
  - Asymptomatic to mild fever, swelling around site of inoculation (Romana’s sign)

- **Chronic Indeterminant Phase:**
  - Lifelong – generally asymptomatic → few or no parasites found in bloodstream

- **Complications of Chagas Disease:**
  - Cardiomyopathies
    - Inflammatory response → cellular damage → cardiac tissue fibrosis
  - Thrombo-embolic syndrome
    - Arrhythmias leading to sudden death
    - Ventrical dilatation(s)
    - Mural endocarditis
    - Thrombic emboli to brain, spleen, kidneys
Chagas Disease

- **Endemic** throughout much of Mexico, Central and South America ~ 8 million infected
  - Southern, P – unpublished estimate of 15% incidence of T cruzi along the Sarstun River
- **Vector**: Triatomine bug thrives in mud walls, thatched roofs → in endemic countries, rural populations at greatest risk for acquiring infection.

**Diagnostics**
- Thin prep reveals presence of trypomastigotes in acute phase.
- Indirect fluorescent antibody (IFA) in chronic phase
- PCR molecular testing for transfusion or transplant performed at CDC

**Treatment**
- Limited in Guatemala
- Nifurtimox (CDC Drug Service: 404-639-3670)
- Benznidazole, Nifurtimox limited in capacity to effect parasitic cure, especially in chronically infected

Public health efforts aimed at preventing transmission have decreased new infections and completely halted vector-borne transmission in some areas. (Guatemala Health Dept 2016)

*Spraying insecticide inside housing to eliminate triatomine bugs*
- screening of blood donations
- early detection and treatment of new cases, including mother-to-baby (congenital) cases
Leishmaniasis

Leishmania parasites -- spread by the bite of *Phlebotomus papatasi* sand flies
- about 1/3rd size of most mosquitoes
- Sand flies usually most active from dusk to dawn.
- They may bite during day if disturbed (i.e. you brush up against the trunk of a tree or other site where sand flies are resting).

Two clinical manifestations
- **cutaneous leishmaniasis**, which causes skin sores
- **visceral leishmaniasis**, which affects several internal organs (usually spleen, liver, and bone marrow).

New World distribution of cutaneous, muco-cutaneous leishmaniasis

Data source & Map production: WHO. 2011
Thanks

- Refuge International
- UTSW Physician Assistance Studies Program/School of Health Professionals
References


Manson's Tropical Disease, 23rd edition, 2014

U.N.-backed Commission for Historical Clarification titled “Guatemala: Memory of Silence”, 1999

Global TB Control report (2015)

USAID (2016)
