Tick-Borne Relapsing Fever Outbreak among Writing Workshop Attendees in an Urban Setting - Austin, Texas, 2017

ANNA KLIQUEVA, MPH
BETSY KIRKPATRICK, RN, CIC
JEFFERY P. TAYLOR, MPH
Background

- Number infected by mosquitoes, ticks or fleas tripled from 2004 through 2016
- Tick-borne illnesses are caused by bacteria, viruses, and/or protozoa
- Two families of ticks, commonly referred to as hard ticks and soft ticks
- Tick-borne diseases in Texas: Lyme, Rocky Mountain Spotted Fever, Ehrlichiosis and Relapsing Fever
Soft Ticks vs. **Hard Ticks**

- They attach and can feed for days
- They seek hosts by "questing"
- They can live from about 2 months to 3 years
- Their preferred habitat is brushy, wooded or weedy areas
Soft Ticks vs. Hard Ticks

- The bite is brief, meals lasting from a few minutes to 1 hour
- They do not “quest” in tall grass or brush
- They can live up to 10 years
- Here in Texas, they are found in burrows, caves, or nests
What are the symptoms of TBRF?

- Symptoms develop 5 - 15 days after tick bite
- Fever, headache, myalgia, arthralgia, chills, abdominal complaints
- Episodes resolve after 3-5 days and “relapse” one week later

Incubation period (5-15 days)
Symptomatic period (3-5 days)
Asymptomatic period (7 days)
How is TBRF diagnosed & treated?

- Observe spirochetes in a blood smear
- Serologic testing for TBRF
- May have false-positive tests for Lyme disease
- Given appropriate treatment, most patients recover within a few days
Timeline – February through May 2017
Timeline – February through May 2017

Onset Pt A
Hosp Pt A
Timeline – February through May 2017

- Wksp Pt A
- Onset Pt A
- Hosp Pt A
Methods

- 2 page survey created
- Property owner provided list of e-mails of all attendees
- Phone interviews conducted
- Interviewed 28/29
  - 21 attendees
  - 6 volunteers
  - 1 owner

February 23rd (Thursday) – February 26th (Sunday)
1. Name: ________________ 2. Phone number: ________________
3. Age: ________________ 4. Gender: ________________
5. City and state of residence: ____________________________
6. What date did you arrive in Austin? __________________
7. What date did you depart Austin? __________________
8. Where did you spend your nights while attending the workshop?
Survey Results

- Reside throughout the US and Canada
- 14 reported “insect bites” on ankles and legs
- None observed the specific insect causing the bites
- Almost all attendees had eaten 2 meals together off site
- Property owners live onsite, 2 adults and 1 child – no symptoms
Results

▪ Case definition: Fever with headache, muscle and/or joint pain (n=11)
▪ 3 hospitalizations
▪ 3 experienced Bell’s Palsy
▪ 2 diagnosed with meningitis
▪ 4 persons reported a rash
▪ Dates of onset of illness: February 26th - March 4th
▪ Illness was associated with insect bites (OR=6.4, 95% CI:1.2-34.6)
▪ Sleeping on-site was not associated with illness (OR=3.8, 95% CI:0.7-19.7)
Timeline – February through May 2017
Timeline – February through May 2017

- Wksp Pt A
- Onset Pt A
- Wksp Pt B
- Blood Smear + Pt B
- Lyme + Pt A
- Lyme + Pt B
Timeline – February through May 2017

- **Wksp Pt A**
- **Hosp Pt A**
- **Blood Smear + Pt B**
- **Lyme + Pt B**
- **Interviews**
- **Onset Pt A**
- **Onset Pt B**
- **Lyme + Pt A**
- **Site Investigation**
Site Investigation

- ZCB and APH set out to investigate on April 26th and 27th
- CO\(^2\) in the form of dry ice is used to mimic CO\(^2\) from a potential host
- Total equipment Used:
  - 59 Sherman Traps for trapping rodents
  - 5 CO\(^2\) Traps for collecting ticks
Results of Site Investigation

- No rodents were captured
- No ticks were caught in the six tick traps
- No sign of rodent excrement or nests inside
- Owner contracts with a pest control company
Conclusions - Why the uptick?

- To our knowledge this has been the largest outbreak of tick-borne relapsing fever in Austin
- One outcome of our investigation focused on the importance of increasing healthcare provider awareness of TBRF in the Austin area
- More information is needed on soft ticks and TBRF in Texas
- Are cases being misdiagnosed (i.e. Lyme)?
- What are the potential ecological factors associated with this increase?
Thank you!

Austin Public Health
Texas Department of State Health Services
CDC Division of Vector-Borne Diseases
Texas State University
Department of Pediatrics
National School of Tropical Medicine at Baylor College of Medicine