Tick-Borne Relapsing Fever

Ornithodoros hermsi
Tick-borne Relapsing Fever (TBRF)

**Agent**
- *Borrelia hermsii, B. parkeri, B. turicatae*
- Visible on stained red blood smear

**Vector**
- In U.S., *O. hermsi, O. parkeri, O. turicata*
- Transmitted from infected female tick to her progeny (transovarial transmission) and from one life stage to next (transtadial transmission)

**Reservoir**
- Peridomestic rodents
  - Chipmunks, squirrels, rats, mice
- Infected animals carry the organism in their blood
- A soft tick acquires infection when they take a blood meal from an infected animal
Tick-borne Relapsing Fever

• **TBRF is a serious disease**
  - However, if treated the case fatality rate is less than 5%
  - If acquired during pregnancy, TBRF poses a high risk of fetal loss (up to 50%)

• **Symptoms**
  - Incubation period: 1 to 14 days
  - Fever, headache, chills, myalgia
  - Febrile episodes 1 to 7 days separated by afebrile periods of 1 to 5 (up to 20) days
  - Up to 10 relapses

http://www.cdc.gov/relapsing-fever/clinicians/
Reported Cases of Tick-borne Relapsing Fever United States

Cases of Tick-borne Relapsing Fever - United States, 1990 - 2011

Each dot, placed randomly within the county of exposure (where known), represents one case.

Each dot, placed randomly within the county of residence, represents one case.

http://www.cdc.gov/relapsing-fever/resources/CasesTBRF.pdf
Tick-borne relapsing fever in California
10 year summary: 2005-2014

• 53 cases over last 10 years
• Median of 5 cases each year (range = 1 - 11)
• Case age range from 1 to 79 years
  – Median 36 years
  – Males more than females (30 to 23)
• Most cases contracted in summer months
  – June to September
• Most frequent counties of exposure (all in the Sierra mountain range)
  – Mono > El Dorado > Nevada > Inyo > Fresno

CDPH Internal Data
Tick-borne relapsing fever in California, 1997 – 2014*

The majority of TBRF cases in California are acquired in mountainous regions

* CDPH surveillance data
High risk sites:
- Rodent-infested cabins 3000 - 9000 feet elevation
- Coniferous forest

Soft ticks live in rodent nests in building
- Seek out blood meal when rodents vacate nest
- Humans vulnerable when sleeping on floor or in beds in contact with walls
Tick-borne Relapsing Fever Exposure

Cabins in northern California where TBRF cases were exposed

In the United States, TBRF exposure most often occurs in a rustic cabin where rodents have made their nests
Preventing Tick-borne Relapsing Fever

- Prevent rodent infestations of dwellings
- Discourage feeding of chipmunks and squirrels
- Store firewood away from dwelling
Preventing Tick-borne Relapsing Fever

• Keep beds away from walls

• Removal of rodents from structure without ectoparasite control may increase disease potential
  – chemicals may not penetrate cracks in walls
  – attempt to identify and remove rodent nests
To find out more about tick-borne relapsing fever in California, visit the CDPH website at:

http://www.cdph.ca.gov/HealthInfo/discond/Pages/TickBorneRelapsingFever.aspx