Tickborne and Arboviral Diseases

Jodi Reber, RN
Vectorborne Nurse Epidemiologist & Regional Communicable Disease Nurse Consultant
North Carolina Division of Public Health
Ticks and Mosquitoes

Photos Courtesy of CDC
Learning Objectives

1. Identify reportable tickborne diseases
2. Distinguish between neuro-invasive and non neuro-invasive arboviral disease
3. Distinguish between viral, arboviral, bacterial, and other causes of meningitis/encephalitis
4. Identify key surveillance criteria for tickborne and arboviral diseases
Tickborne Terminology

- Rocky Mountain Spotted Fever (RMSF) is now Spotted Fever Group

- Human Granulocytic Anaplasmosis (HGA) is now Anaplasmosis
RMSF Rash

- Late symptom
- Indicates high risk for life-threatening illness

Photo Courtesy of CDC
Tickborne Disease

Serology tests results

- Anemia
- Leukopenia
- Thrombocytopenia
- Elevated liver enzymes
Surveillance Labs

- Not required
- Not always performed
- Most commonly used requires two separate tests
RMSF, Ehrlichiosis, Anaplasmosis

Surveillance criteria

• No fever = no case
• Requires clinical and laboratory criteria
• Medical diagnosis may substitute for clinical criteria, but lab criteria must still be met
RMSF, Ehrlichiosis, Anaplasmosis

Confirmed event

- Requires clinical evidence (not just a medical diagnosis)
- Requires two serum tests taken 2-4 weeks apart showing a four-fold change in titer
Tickborne Disease

**Suspect Case Classification**

- Use when unable to obtain any data from physician
- Applies when internal policy for collection of surveillance data has been met
Lyme Disease

- Discovered in Lyme, Connecticut in 1975
- Most common tickborne disease in US
- Over 20,000 cases reported annually
- Can now be acquired in NC
Early Localized Lyme Disease

Erythema migrans (EM) rash
- First sign in 60-80% of patients
- Gradually expands over several days
- Up to 12 inches (30 cm) across
- Center of the rash may clear as it enlarges – “bull's-eye”

Photos Courtesy of CDC
Early Disseminated Lyme Disease

Systemic Manifestations

- Fatigue, chills, fever, headache, muscle and joint aches, swollen lymph nodes
- Additional skin rashes possible
- Neurologic symptoms (15% of untreated patients)
- Cardiovascular symptoms (5-10% of untreated patients)
Late Lyme Disease

- Lyme arthritis:
  - ~ 60% of untreated patients
- Neurologic disease:
  - ~ 5% of untreated patients will have persistent neurologic symptoms
Lyme Disease

Surveillance criteria

- Requires clinical and laboratory criteria
- Medical diagnosis may substitute for clinical criteria, but lab criteria must still be met
- May need more than one lab to meet lab criteria
Lyme Disease

**Suspect Case Classification**

- Use when unable to obtain any data from physician
- Applies when internal policy for collection of surveillance data has been met
Tickborne Disease

Treatment

- Drug of Choice = Doxycycline
- Treat patient if tickborne disease is suspected...do not wait for laboratory test results
Babesiosis

- Not acquired through tick bite in NC
- Transfusion-associated
- Reportable in US in 2011
- Reportable in NC in future
Arboviral Disease

Photos Courtesy of CDC
Arboviral Diseases Reportable in North Carolina

- Neuro Invasive Disease
  - West Nile Virus
  - La Crosse Encephalitis
  - Eastern Equine Encephalitis
  - Western Equine Encephalitis
  - St. Louis Encephalitis
- Malaria
- Dengue
- Yellow Fever
Arboviral Disease

Surveillance criteria

● Neuro Invasive Disease
  ● Requires clinical & laboratory criteria

● Travel history
Prevention and Control Measures

- http://www.epi.state.nc.us/epi/arbovirus/mosquito.html
References

- North Carolina Communicable Disease website:
  http://www.epi.state.nc.us/epi/gcdc.html

- Centers for Disease Control Website:
  http://www.cdc.gov/