UVM Project ECHO: Current Topics in School Nursing

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                      LE Faricy, MD
                      Clara Keegan, MD
                      William Raszka, MD

Didactic presentation is recorded. Registered participants will receive the link.
Session Agenda

• Welcome Participants and Presenters
• Objectives
• Didactic Presentation (20-30 min)
  • Q&A
• Case presentation(s)
  • Clarifying questions
  • Discussion
  • Recommendations
  • Summary
• Closing Announcements
ECHO Model: All Teach, All Learn

Cohort-based learning on ZOOM

• Have your camera on as much as possible, especially when joining the meeting and during discussions
• Questions and comments are welcome – use the “raise hand” feature or put them in the chat
• This is not a webinar! Participation is key

Case-based learning

• 1-2 participant cases each session using provided template
• Contact Liz Manz to present a case
ECHO: Cohort-based learning

• Shared participant directory for additional networking
• Get to know others in the group
  • “Rename” your video
  • Write your name and organization into the chat
• Faculty presenters available for follow up questions
ECHO: Case-based learning

• Participants bring real world scenarios from their work
• Opportunity to receive input from peers and faculty
• Cases sometimes match the topic, but not necessary
• What makes a good case:
  • A complex situation where you would appreciate hearing new ideas
    Question for the group may be: After trying many of the first-line strategies without success, what other things could be tried?
  • A common situation that could be discussed from various perspectives
    The questions you pose could help you and others rethink assumptions or learn new strategies.
Series Objectives

Learning objectives for this ECHO series include the ability to:

- Implement the elements of Motivational Interviewing that are key to promoting behavior change
- Identify communication skills that facilitate collaboration with students and families
- Describe best practices in managing common health concerns, including tick bites and asthma
- Apply knowledge to support youth exploring gender identity
- Explain basic medical aspects of gender affirming care
- Develop strategies to respond to vaping among students
CMIE Disclosures

University of Vermont (UVM) Office of Continuing Medical and Interprofessional Education (CMIE) is approved as a provider of Continuing Medical Education (CME) by the ACCME. UVM designates this internet live activity for a maximum of 1.5 AMA PRA Category 1 Credits.

UVM CMIE is accredited by the American Nurses Credentialing Center (ANCC) to provide CE for the healthcare team. This program has been reviewed and is acceptable for up to 1.5 Nursing Contact Hours.

Participants should claim only the credit commensurate with the extent of their participation in the activity.
CMIE Disclosures

**Interest Disclosures:** As an organization accredited by the ACCME to sponsor continuing medical education activities, UVMCMIE is required to disclose any real or apparent conflicts of interest (COI) that any speakers may have related to the content of their presentations.

**Meeting Disclaimer:** Regarding materials and information received during this educational event, the views, statements, and recommendations expressed during this activity represent those of the authors and speakers and do not necessarily represent the views of the University of Vermont.
Lyme/Ticks and Mosquitoes

William V. Raszka, Jr., MD
Chief, Pediatric Infectious Disease Service
Vermont Children’s Hospital
September 21, 2022
Session Objectives

• Describe the epidemiology of illnesses transmitted by *Ixodes* ticks
• Compare and contrast the clinical manifestations, diagnosis, and management of infections caused by:
  • *Borrelia burgdorferi*
  • *Anaplasma phagocytophilum*
  • *Babesia microti*
• Explain best practices for prevention of tick borne illnesses
• Review testing for mosquito borne illnesses by the health department
Case

• An 8 year old goes to the school nurse because of a rash on her arm. She denies pain or itchiness at the site.

• Her temperature is 100.4F

• The mother works at a restaurant; the grandmother runs a child care center. Neither can pick up the child

• Can she remain in school?
Overview of tick borne illness in VT

Vermont Emergency Room & Urgent Care Visits for Human Tick Encounters

Tick Encounter = any visit due to tick-related issues such as a recent tick bite or a request for tick removal.
Life stages of *Ixodes scapularis*
Pathogen Prevalence in Deer Ticks (2020; N=1597)

<table>
<thead>
<tr>
<th></th>
<th>Adults</th>
<th>Nymphs</th>
<th>All Life Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticks tested from spring (n)</td>
<td>994</td>
<td>49</td>
<td>1,043</td>
</tr>
<tr>
<td>Ticks tested from fall (n)</td>
<td>554</td>
<td>0</td>
<td>554</td>
</tr>
<tr>
<td>Total ticks tested (n)</td>
<td>1,548</td>
<td>49</td>
<td>1,597</td>
</tr>
<tr>
<td><em>Borrelia burgdorferi</em> (%)</td>
<td>60%</td>
<td>12%</td>
<td>59%</td>
</tr>
<tr>
<td><em>Anaplasma phagocytophium</em> (%)</td>
<td>10%</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td><em>Babesia microti</em> (%)</td>
<td>6%</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td><em>Borrelia miyamotoi</em> (%)</td>
<td>1%</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>

VDH
Lyme: epidemiology
Transmission of Lyme Disease

- *Borrelia* injected into blood
- Attachment needs to be $\geq 36-48$ hours

[Graph: Probability of Transmission versus Hours Tick Attached]

Feed time (hours) 0 24 48 72 96

[Image: Ticks at different stages of feeding (CDC)]

Symptoms of Lyme

Relative frequency of clinical features among confirmed cases of Lyme disease—Vermont, 2007-2017

- Meningitis or Encephalitis: 1%
- Erythema Migrans (EM) Rash: 71%
- Radiculoneuropathy: 4%
- Facial Palsy: 10%
- Carditis: 1%
- Arthritis: 39%
Time course

1-3 weeks after bite

- Early localized Lyme: Latency period: 7-10 days
- Early disseminated Lyme: Occurs 3 to 5 weeks after tick bite
- Late Lyme: Occurs months to years after tick bite

www.villalapazfoundation.org
http://z.about.com
Think Lyme

• Rash:
  • Slowly expanding red flat rash > 5 cm
  • Multiple rings or flat red rashes on body

• Sudden onset Bell’s palsy

• Swelling of knee with modest pain and signs of inflammation
Diagnosis of Lyme Disease

• **Must have:**
  • Epidemiologic exposure
  • Characteristic clinical findings

• **Serology: two step**
  • IgM or IgG by EIA *confirmed* by second test
    • *pretest probability* is critical
  • Sensitivity of serology
    • 50% for early localized
    • >85% for early disseminated
    • >95% for late

Clinical diagnosis!

# Treatment of Lyme

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
<th>Dosage</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythema migrans</td>
<td>Doxycycline</td>
<td>4.4 mg/kg/day in 2 doses</td>
<td>10 days</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>50 mg/kg/day in 3 doses</td>
<td>14 days</td>
</tr>
<tr>
<td>Facial palsy</td>
<td>Doxycycline*</td>
<td>4.4 mg/kg/day in 2 doses</td>
<td>14 days</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Doxycycline</td>
<td>4.4 mg/kg/day in 2 doses</td>
<td>28 days^</td>
</tr>
<tr>
<td></td>
<td>Amoxicillin</td>
<td>50 mg/kg/day in 3 doses</td>
<td>28 days</td>
</tr>
<tr>
<td>Meningitis</td>
<td>Doxycycline</td>
<td>4.4 mg/kg/day in 2 doses</td>
<td>14 days</td>
</tr>
<tr>
<td></td>
<td>Ceftriaxone</td>
<td>50-75 mg/kg once</td>
<td>14 days</td>
</tr>
</tbody>
</table>

*Do not use steroids

^ safety of doxycycline of doxycycline for > 21 days in children under 8 not established
Prevention of Lyme Disease

• Appropriate clothing
• Insect repellents
  • DEET (20-30%)
  • Picaridin (20-30%)
  • IR3535
• Insecticides
  • Permethrin (clothing)
• Tick checks
• Scrubbing
Antimicrobial prophylaxis

- Randomized trial of *adults*
  - Hyperendemic region of CT
  - *Ixodes* tick removed in past 72 hours
  - Single 200 mg dose of doxycycline

- Results
  - 1/235 (0.4%) doxycycline treated developed EM
  - 8/247 (3.2%) placebo treated developed EM
  - 30% of doxycycline complained of side effects (vs 10%)

- Prophylaxis reserved for high risk situations
  - Need to treat number = 36

Recommendations for prophylaxis

Generally, infectious disease experts do not recommend the routine use of antibiotics following a tick bite as a way to prevent Lyme disease. Health care providers might offer patients a single dose of antibiotics after a tick bite if:

1. The tick can be identified as a nymphal or adult blacklegged tick (*Ixodes scapularis*);
2. The tick has been attached for 36 hours or more;
3. The antibiotic can be given within 72 hours of tick removal;
4. Antibiotics are not contraindicated, and;
5. Lyme disease is common in the area where the tick bite occurred. If you believe you picked up the tick anywhere in Vermont or neighboring states, this condition would be met.

This type of treatment, called post-exposure prophylaxis, is not recommended as a way to prevent other tickborne diseases in Vermont such as anaplasmosis, babesiosis or ehrlichiosis.

Pediatric dose is 2.2 mg/kg of doxycycline
Sequelae of Lyme Disease

• Long term problems in children are rare
  • Early or late disease

• Post-Treatment Lyme Disease Syndrome
  • Very controversial
    • 10% of all people
    • Lingering symptoms of fatigue, pain, or joint and muscle aches
    • No known cause (?autoimmune)
  • Not improved with antibiotics*
    • two randomized trials

Anaplasmosis: epidemiology

Figure 3 – Annual reported incidence (per million population) for anaplasmosis – United States, 2018. (NN= Not notifiable)

2nd most common tick borne illness in Vermont
Anaplasma: Vermont epidemiology

- Vermont Department of Health (VDH)

Anaplasma phagocytophilum Infection Prevalence Among Host-seekng Blacklegged Ticks (%)

- 0
- 0.1-6.0
- 6.1-12.0
- 12.1-18.0
- >28 ticks collected*

* Infection prevalence not available

Anaplasmosis Incidence, 2019 (cases per 100,000 people)

- <17
- 17-50
- 51-100
- 101-200
- >200
Reported cases of anaplasmosis in Vermont, 2008–2019

*Anaplasmosis became reportable in 2008

- Probable
- Confirmed

Year | Cases
--- | ---
2008 | 3* 
2009 | 2
2010 | 3
2011 | 10
2012 | 17
2013 | 37
2014 | 67
2015 | 139
2016 | 201
2017 | 399
2018 | 244
2019 | 535
Anaplasmosis Incidence (per 100,000) by Age Group and Sex, 2019

- **Female**
- **Male**

Age Group (years):
- 0-4
- 5-9
- 10-14
- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85+

Incidence values for each age group and sex are represented by the height of the bars.
Anaplasmosis cases by month of illness onset, 2008–2019
Most cases occur in the summer and increase again in the fall

VDH
Reported Symptoms of Anaplasmosis Cases, 2018

- Fever: 98%
- Malaise: 84%
- Muscle Aches: 67%
- Chills: 65%
- Headache: 64%
- Joint Pain: 42%
- Nausea: 41%
- Confusion: 24%
- Vomiting: 14%
- Rash: 9%
Anaplasmosis: diagnosis and treatment

• Diagnosis
  • Clinical suspicion
  • Serology
    • Single elevated IgG IFA
      • Negative first 7-10 days
      • Four fold rise in titers
  • Histology
  • PCR
    • Positive first week

• Treatment
  • Doxycycline
    • 4.4 mg/kg/day/2 for 7-14 days

CDC
Babesiosis

Number* of reported cases of babesiosis, by county of residence — 40 states, 2018†

* N = 2,144; county of residence was known for all but 17 (1%) of the 2,161 total case-patients. See the Appendix for the maps for surveillance years 2011–2017.

CDC
**Babesia microti** (babesiosis)

Babesiosis is the third most reported tickborne disease in Vermont. In the Northeast, it is caused by a microscopic blood parasite called **Babesia microti**.

In 2020, Bennington County had the highest *Babesia microti* infection prevalence among host-seeking (adult females and nymphs) blacklegged ticks.
Percentage of Babesiosis Cases by Sex and Age Group, 2008–2018

- Female
- Male

Age Groups:
- <20
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85+

VDH
Babesiosis Cases by Month of Illness Onset, 2005–2018

VDH
Babesiosis

- High index of suspicion
  - Travel
  - Immunocompromised
  - Asplenic
  - Weeks to months after exposure
- Highly variable clinical presentation
  - Normal
  - Fever, chills, malaise
  - DIC
- Labs
  - Hemolytic anemia
  - Thrombocytopenia
- Diagnosis
  - Peripheral smear
  - PCR
- Treatment
  - Doxycycline is NOT part of the regimen
Universal themes:

• Tick borne illnesses are more common in summer months*

• Prevention is key:
  • Protective clothing
  • Insect repellants
  • Insecticides
  • Tick checks

*Lyme arthritis diagnosed at any time

CDC
Mosquito testing in Vermont

2022 Vermont Mosquito Testing Results

WNV = West Nile Virus
EEE = Eastern Equine Encephalitis

Animal Surveillance
• No animal cases of WNV or EEE have been reported in 2022.

Human Surveillance
• No human cases of WNV have been reported in 2022.
• No human cases of EEE have been reported in 2022.
Case

• An 8 year old goes to the school nurse because of a rash on her arm. She denies pain or itchiness at the site.

• Her temperature is 100.4F

• The mother works at a restaurant; the grandmother runs a child care center. Neither can pick up the child

• Can she remain in school?
Q and A with Dr. Razka

End didactic session recording prior to moving to case presentation
Case Presentation

**DO NOT INCLUDE:**
Names, Address, DOB, Phone/Fax #, Email address, Social Security #, Medical Record #

Consider the level of detail necessary. Go with less when possible.

The discussion and materials included in this conference are confidential and privileged pursuant to 26VSA Section 1441-1443. This material is intended for use in improving patient care. It is privileged and strictly confidential and is to be used only for the evaluation and improvement of patient care.
Case Presentation

Participant presents the case and poses the question(s) for the group

| Clarifying questions about the case from group to case presenter |
| Ideas, suggestions, recommendations from participants |
| Ideas, suggestions, recommendations from ECHO faculty team |
| Full group discussion |
| Summary and wrap-up by facilitator |
Closing Announcements

• Slides are posted at www.vtahec.org
• Recording of didactic portion will be sent by email to the full cohort
  • For the use of registered participants only
• Please complete evaluation survey after each session
• CE information and QR Code will be sent once evaluation is received
• Please contact us with any questions, concerns, or suggestions:
  • Katherine.Mariani@uvm.edu
  • Patti.Smith-Urie@uvm.edu