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Education on Tick Bites, Tick Borne Disease, and Prevention in Middlebury, VT

Florence DiBiase, MS3
Family Medicine Rotation: May-June 2017
Clinical Site: Middlebury Family Health, Middlebury, VT

Faculty Mentors: Dr. Andersson-Swayze, Dr. Fuller, Dr. Larson, Dr. Miller, Dr. Puls, Dr. Wilhelm
Problem Identification and Need

- Tick bites and tick borne diseases are increasing in prevalence in Vermont
  - A 2015 study found US cases of Lyme disease had risen 200% since 2005
    - VT is one of 14 states that account for 95% of Lyme disease
    - Incidence of 240,000-440,000 cases/year
  - 2017 has thus far continued this upward trend
  - Over 60% of *I. scapularis* ticks in Vermont carry at least one pathogen, and 52.8% of the ticks tested carried *Borrelia burgdorferi*

- Patient awareness and preventative actions are lacking, especially in regards to more recently identified diseases
  - A 2015 study demonstrated 21% of US respondents had a household member that had found a tick on his or her body in the previous year, but patients were not well informed on endemic areas
  - In the same study, 20.8% of respondents from New England reported they had not heard of any tick borne diseases in their area, and 51.2% of respondents reported they did not routinely take personal prevention steps against ticks

- There is increased need for education of both patients and providers
  - **Patients**: Prevention, how to remove ticks safely, and when to seek medical help
    - This can help to prevent disease, allow patients to enjoy the outdoors safely, and eliminate unnecessary healthcare spending
  - **Providers**: How to educate patients, when to suspect disease, when to treat prophylactically, and how to treat disease
    - This can help prevent disease, eliminate complications of disease, and decrease antibiotic resistance
Public Health Cost and Unique Cost Considerations in Host Community

- Burden of diseases - chronic multisystem complications and can even be fatal
  - Lyme Disease
    - Patient with Lyme disease spend on average $2,968 higher total healthcare costs and 87% more outpatient visits over the course of 1 year in comparison to matched controls with no evidence of Lyme exposure
    - Testing for Lyme disease alone costs $492 Million annually
  - Anaplasmosis
  - Erlichiosis
  - Babesiosis
  - Powassan Virus
    - No cure, 10% fatality rate
- Antibiotic resistance due to excessive prophylactic treatment
- Threatening enjoyment of rural living, working in natural habitats, and maintaining an active lifestyle
  - Farmers, owners of sugarwoods, and outdoor leisure enthusiasts make up a significant portion of the community in Addison county
Community Perspective on Issue and Support for Project

• Community Interviews:
  • Dr. Chris Grace, MD, FIDSA- Medical Director of Infectious Disease at UVMMC
  • Jeffrey Heath, RN- Public Health Nurse Supervisor at Middlebury Office of Local Health
  • Sydney White, BSN, RN- Public health Nurse at Vermont Department of Health

• Interview Takeaways:
  • Addison County is both identifying tick borne diseases and testing for tick borne diseases more frequently, esp. Lyme Disease and Anaplasmosis
    • Likely a combination of increased prevalence as well as increased awareness/clinical suspicion
    • Tick panels have increased ease of testing
  • Warmer winters, fluctuations in populations of animal hosts, and migration of new diseases northward suggest these issues will continue to rise
  • The most vital changes for providers to make
    • Continuing to research and share information on these diseases
    • Self-educate regarding presenting disease symptoms
    • Educate patients whenever possible
    • Standardize prophylaxis and treatment regimens based on evidence based guidelines
Intervention and Methodology

• A 6-page educational guide was created by combining information from online articles, the CDC, the VT Department of Health, and community interviews:
  • **Provider Handout (pg. 1-5)**
    • *Fast Facts:* Recent statistics on VT tick borne diseases
    • *Recognizing VT Native Ticks:* color images, diseases transmitted, and peak seasons
    • *Tick borne diseases Cheat Sheet:* Signs and symptoms, lab findings, diagnostic testing, and treatment
  • **Patient Education Handout (pg. 6)**
    • Attachable PDF handout created to be implemented into electronic health record patient education materials
      • Contains a 2 in x 3 in card that patients can cut out and keep handy in wallet
Results

• Educational materials compiled and presented to Middlebury Family Health in guide
  • Help providers make clear and educated decisions in patient care
  • Help patients avoid tick bites and when bitten, know the next steps

• Results of this intervention should be more apparent over time and are something to watch for beyond the end of this clinical rotation
Evaluation of Effectiveness and limitations

• In the process of sharing pamphlet with MFH staff and obtaining feedback

• Limitations:
  • No matter how educated we become, these issues are unlikely to disappear
  • This project is just one way to spread awareness and educate patients and providers
  • It would be helpful to discuss handout with patients presenting for tick bites and obtain their input on its usefulness
  • Results could be strengthened using additional resources from the Vermont Department of Health and the CDC, especially the “Be Tick Smart” program material
Recommendations for Future Interventions and Projects

• MFH could continue to order Be Tick Smart pamphlets and tick identification cards for the waiting room/office
• Hosting a class in the community to increase awareness of disease rates and prevention strategies
  • Before and after surveys to determine benefit
• Surveying Providers about use of prophylactic Doxycycline for Lyme Disease
• Streamlining the triage process for patients calling or using the online portal for complaints of tick bites
• Working with UVMMC, Middlebury College, and other academic institutions in the state to improve research, understanding, and treatments available
• Learn more about new research efforts for a Lyme Vaccine (new clinical trial in the U.S. and Belgium as of 2017)
References

• Centers for Disease Control. How to Remove a Tick. June 1, 2015. https://www.cdc.gov/ticks/removing_a_tick.html (image also obtained from this page)
• Grace, C. (2017, June 7). Email interview.
• White, Sydney. (2017, June 13). Email interview.

IMAGES:
• Images of Blacklegged tick with dime, Life cycle, Insect repellent, embedded tick, engorged tick, and erythema migrans rash all obtained from Dr. Grace’s lecture (cited above)
• Images of Ticks Species: Centers for Disease Control and Prevention, National center for Emerging and Zoonotic Infectious Diseases. “Geographic distribution of ticks that bite humans.” June 1, 2015. https://www.cdc.gov/ticks/geographic_distribution.html
Interview Consent Form

• Thank you for agreeing to be interviewed. This project is a requirement for the Family Medicine clerkship. It will be stored on the Dana Library ScholarWorks website. Your name will be attached to your interview and you may be cited directly or indirectly in subsequent unpublished or published work. The interviewer affirms that he/she has explained the nature and purpose of this project. The interviewee affirms that he/she has consented to this interview. Yes X / No _____ If not consenting as above: please add the interviewee names here for the department of Family Medicine information only.