Lyme Disease Patient Care: An Exploration of the Opportunity for Quality Improvement and Standardization of Healthcare Services in the Lehigh Valley Health Network.

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Lyme Disease Patient Care: An Exploration of the Opportunity for Quality Improvement and Standardization of Healthcare Services in the Lehigh Valley Health Network

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**BACKGROUND / INTRODUCTION**

- Lyme disease (LD) is the most commonly reported vector borne illness in the US.
- The bacteria responsible for LD, *Borrelia burgdorferi* (Bb), is transmitted by an ixodes scapularis tick attachment lasting 36-48 hrs.
- The characteristic Erythema Migrans (EM) Lesion (Bulls Eye or Target Rash) is present in 70% of infected individuals.
- Other symptoms can manifest days to months after a tick bite.
- Symptomology is extremely variable per case and ranges from fever and headache to neurological and cardiac manifestations.

**METHODS**

A. The opportunity for quality of care improvements will be assessed via exploration of patient care implications associated with current system

B. A retrospective chart review of patients referred to ID department for LD from 2015-2016 will be carried out with RedCap and Excel software, then analyzed with descriptive statistics.

**RESULTS/DISCUSSION**

**1. Collection of Patient History and Assessment of Risk**

- Currently Lyme patient intake and consultation notes are at unstandardized practitioner discretion
- Studies show factors like recreational activities and symptom duration/evolution may be key considerations for a LD diagnosis, yet are not consistently recorded.
- An incomplete and nonstandardized patient history may result in imprecision with diagnosis and treatment plans.

**2. Serological Testing**

- The CDC recommended 2 tier testing algorithm for LD is designed to optimize sensitivity and specificity.
- It’s composed of a nonspecific Enzyme-Linked Immunosorbent Assay confirmed by a specialized Western Blot.
- Studies reveal this system to be ~98.5% and ~90% sensitive in late and early stage LD respectively.
- Potential errors in application of this system include:
  - performing the 2nd tier of the test and not the 1st, (doubling the likelihood of a false positive)
  - incorrect timeframe of testing
  - performing testing when not clinically indicated.
- The FDA predicts the direct medical cost of inaccurate testing to be $1,226 a case (accounting for visits, treatments, and testing).

**3. Treatment and Administration of Antibiotics**

- Despite established professional society guidelines, treatment may be variable. Potential error includes:
  - prolonged antibiotic treatment
  - antibiotics without shown efficacy against Bb.
- unstandarded alternative treatments

**Patients that receive unneeded antibiotic treatment:**
- face unnecessary health risks associated with the drug, from minor adverse events (ie diarrhea) to major ones (ie septic shock).

**Patients that receive delayed antibiotic treatment:**
- are at greater risk for disease complications.
- late-stage LD direct healthcare costs are ~$916 more compared to early-stage LD costs (average annual LD medical costs being $2,968).

**CONCLUSION**

Considering the increasing presence of Lyme Disease in the LVHN region, as well as the financial and health risks associated with mistreatment/misdiagnosis of this disease, there is an enormous opportunity for quality improvement.

- A retrospective chart review will allow better insight on the state of the current system.
- Potential future interventions include development of targeted LD training programs for practitioners, EPIC prompts during a consult, and enrollment questionnaires.

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