

Laboratory Blood-Based Testing for Non-Lyme Disease Tick-Borne Infections at a National Reference Laboratory: A 7-Year Experience

Background

- In the United States, vector-borne infections are most frequently caused by a tick bite. While Lyme disease is the most prevalent tick-borne infection (TBI), there are also several non-Lyme TBIs (NLTBIs) reported in the United States.¹
- Based on reporting to the Centers for Disease Control and Prevention (CDC), the number of cases of NLTBIs increased during years 2004 through 2016.¹
- In a previous analysis of Quest Diagnostics laboratory data, testing and positivity for Lyme disease was found to have increased in the United States beyond that reported to the CDC during years 2010-2016.² Given that TBIs and NLTBIs are reported using similar systems, NLTBIs may also be under-reported.
- **Objective:** In this study, the investigators evaluated trends in testing for NLTBIs and positivity rates across the United States according to test data from Quest Diagnostics, a national clinical reference laboratory.

Methods

- Deidentified NLTBI testing results were retrieved from a database at Quest Diagnostics and examined for the 7-year period of 2010 through 2016.
- Test results for the following diseases were retrieved: anaplasmosis, babesiosis, Colorado tick fever (CTF), ehrlichiosis, rocky mountain spotted fever (RMSF), tick-borne relapsing fever (TBRF), and tularemia.
- NLTBI testing had been conducted using polymerase chain reaction (PCR), serological tests (immunofluorescence assay or direct agglutination), or both.
- Trends in test volume and the number of positive tests over time were determined. The testing data were categorized by year and state of residence.

Results

- Test volume increased during the study period for 6 of 7 NLTBIs; CTF volume increased from 2010 to 2015 but then decreased in 2016.
- The positivity rate varied over time for all 7 NLTBIs.
- The number of positive tests generally increased from 2010 to 2016 for babesiosis PCR (109 to 270), anaplasmosis PCR (50 to 244), and tularemia serology (567 to 1,803). These increases did not always correlate with increases in percent of positive tests, though they did for tularemia serology.
- Most positive tests were from upper states of the Northeast and Midwest.

Conclusions

- These findings indicate that testing for NLTBIs has increased in the United States since 2010; the number of positive test results for some NLTBIs also increased, though positivity rates generally varied.
- The number of positive results observed in this study were often higher than the number of cases reported to the CDC. This observation may suggest under-reporting of NLTBIs, but the differences in criteria (positive laboratory test vs confirmed case) must be considered.¹
- The laboratory data presented in this study complement the CDC data for understanding testing trends.

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