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Division of Public Health

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Date: 1 APR 2015
To: NC Medical Providers

From: Dr. Megan Davies, State Epidemiologist 
Subject: Annual Update on Diagnosis and Surveillance for Tickborne Rickettsial Disease (2 pages)

Spotted Fever Group Rickettsiosis, Ehrlichiosis and Anaplasmosis Diseases --Introduction:

Tick-borne rickettsial diseases (TBRD) share clinical similarities and include Rocky Mountain spotted fever as well as diseases caused by other *Rickettsia*, *Ehrlichia* and *Anaplasma* species. Rocky Mountain spotted fever and other spotted fever illnesses are not distinguished by the present level of testing and, for surveillance purposes, are reported as Spotted Fever Group Rickettsiosis (SFGR, *Rickettsia spp.*). SFGR predominate in NC and comprise 85% of all TBRD reported in 2014. Cases of Human Monocytic Ehrlichiosis (13%) and Anaplasmosis (2%) are caused by *Ehrlichia chaffensis* and *Anaplasma phagocytophilum* respectively.

Confirmation of Diagnosis and Surveillance:

Serologic testing of specimens by Immunofluorescent Assay (IFA) of IgG antibody is the most common means to confirm a diagnosis of TBRD for surveillance purposes. Although testing is available for RMSF specifically, the test is not species specific and will cross react with other species in the genus *Rickettsia*. Testing for spotted fever rickettsia is available at no charge from the State Laboratory of Public Health. See: <http://slph.state.nc.us/virology-serology/special-serology.asp>. The CDC notes that ELISA (EIA) tests alone are not quantitative and IgM tests lack specificity. For these reasons, if testing is performed through a commercial laboratory, we strongly encourage the use of paired acute and convalescent (2-3 weeks later) sera submitted for IgG IFA testing for surveillance purposes.

Several commercial laboratories (LabCorp, Quest Diagnostics, ARUP, Mayo Medical Laboratories) also offer PCR testing for *Rickettsia rickettsii*, *Ehrlichia chaffensis* and *Anaplasma phagocytophilum* or some combination of them. DNA detection is a confirmatory test per the national case definitions for TBRD and may, from a surveillance standpoint, lead to higher proportion of confirmed cases, because a convalescent clinical specimen is not required.

In North Carolina, the number of reported cases of SFGR (including RMSF) has increased steadily since 2009. However, only about 5% of cases in any year are confirmed via paired acute and convalescent serology. The vast majority of cases are classified as probable, based on a single serologic result. While this is consistent with national reporting patterns, we request your support to improve surveillance by ordering both acute and convalescent serum samples (or consider PCR testing). (Figures 1 – 4)

Treatment:

Regardless of the ultimate cause of infection, if TBRD is suspected, patients of all ages, including children, should be treated promptly and appropriately with doxycycline. [1,3,4] Laboratory confirmation of infection with TBRD organism may take weeks and therapy should not be delayed pending diagnosis. TBRD are potentially fatal and treatment guidelines are available. In a recent survey of healthcare providers, 80% identified doxycycline as the appropriate treatment for Rocky Mountain spotted fever in patients greater than 8 years old, but only 35% correctly chose doxycycline in patients aged less than 8 years. These findings raise concerns about the higher pediatric case-fatality rate of Rocky Mountain spotted fever observed nationally. [2]

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Recommendations of the CDC and American Academy of Pediatrics [3,4,5]

The use of doxycycline to treat suspected ehrlichiosis/RMSF in children is standard practice recommended by both CDC and the AAP Committee on Infectious Diseases. Unlike older generations of tetracyclines, the recommended dose and duration of medication needed to treat ehrlichiosis/RMSF has not been shown to cause staining of permanent teeth, even when five courses are given before the age of eight. Healthcare providers should use doxycycline as the first-line treatment for suspected ehrlichiosis/RMSF in patients of all ages.

If you have any questions about surveillance of tick borne rickettsial diseases please visit our website (<http://epi.publichealth.nc.gov/cd/diseases/ticks.html>) or contact Jodi Reber or Carl Williams at 919-733-3419.

References:

1. Diagnosis and Management of Tickborne Rickettsial Diseases: Rocky Mountain Spotted Fever, Ehrlichioses, and Anaplasmosis. MMWR Recomm Rep. 2006 Mar 31;55(RR-4):1-27.
2. Zientek, et. al. Self-reported treatment practices by healthcare providers could lead to death from Rocky Mountain spotted fever. J Pediatr. 2014 Feb;164(2):416-8
3. <http://www.cdc.gov/rmsf/symptoms/>
4. <http://www.cdc.gov/ehrlichiosis/symptoms/>
5. Todd, et. al. No Visible Dental Staining in Children Treated with Doxycycline for Suspected Rocky Mountain Spotted Fever. J Pediatr. 2015 Mar 14

Figures 1 – 4

