

Rocky Mountain Spotted Fever and Spotted Fever Rickettsiosis

Merlin reporting code = 08309
 Case report form (CRF): [Tick-Borne Rickettsial Disease CRF](#)
MERLIN EXTENDED DATA REQUIRED

Background

Spotted fever rickettsioses are a group of tick-borne infections caused by some members of the genus *Rickettsia*. Rocky Mountain spotted fever (RMSF) is an illness caused by *Rickettsia rickettsii*, a bacterial pathogen transmitted to humans through contact with ticks. *Dermacentor* species of ticks are most commonly associated with infection, including *Dermacentor variabilis* (the American dog tick), *Dermacentor andersoni* (the Rocky Mountain wood tick), and more recently *Rhipicephalus sanguineus* (the brown dog tick). Disease onset occurs 3-14 days following a tick bite. Age-specific illness is highest for children and older adults. Illness is characterized by acute onset of fever, and may be accompanied by headache, malaise, myalgia, nausea/vomiting, or neurologic signs; a macular or maculopapular rash appears 4-7 days following onset in many (~80%) patients, often present on the palms and soles. RMSF may be fatal in as many as 20% of untreated cases, and severe, fulminant disease can occur. In addition to RMSF, human illness associated with other spotted fever group *Rickettsia* species, including infection with *Rickettsia parkeri* (associated with *Amblyomma maculatum* ticks), *Rickettsia amblyommi*, and *Rickettsia africae* have also been reported. In these patients, clinical presentation appears similar to, but may be milder than, RMSF; the presence of an eschar at the site of tick attachment is useful for differentiating between *R. parkeri* or *R. africae* and most other spotted fever rickettsioses from *R. rickettsii*. Serologic tests for RMSF can cross-react with spotted fever *Rickettsia* (SFR) species.

Clinical criteria for case classification

Any reported fever **and** one or more of the following: rash, eschar, headache, muscle aches, anemia, thrombocytopenia, or any hepatic transaminase elevation.

Laboratory criteria for case classification

Confirmatory:

- Serological evidence of a fourfold change in IgG-specific antibody titer reactive with *Rickettsia rickettsii* or other SFR antigen by indirect immunofluorescence assay (IFA) between paired serum specimens (one taken in the first week of illness and a second 2-4 weeks later),
- OR
- Detection of *R. rickettsii* or other SFR DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR),
- OR
- Demonstration of SFR antigen in a biopsy or autopsy specimen by immunohistochemistry (IHC),
- OR
- Isolation of *R. rickettsii* or other SFR from a clinical specimen in cell culture.

Presumptive:

- Single elevated IgG antibody reactive with *R. rickettsii* or other SFR antigen by IFA, enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or latex agglutination.

Epidemiological criteria for case classification

Exposure is defined as having been in potential tick habitats within the past 14 days before onset of symptoms. Occupation and travel history should be recorded if relevant to exposure. A history of a tick bite is not required.

Case classification

Confirmed:

A clinically compatible illness in a person with confirmatory laboratory evidence.

Probable:

A clinically compatible illness in a person with presumptive laboratory evidence.

Suspect:

A person with presumptive laboratory evidence but no clinical information available.

Comments

Acute illness is best detected by PCR and IHC methods in skin biopsy specimens, and occasionally by PCR in appropriate whole blood specimens taken during the first week of illness, prior to antibiotic treatment. Serology can also be employed for detection, however an antibody response may not be detectable in initial samples, and paired acute and convalescent samples are essential for confirmation.

Current commercially available ELISA tests are not quantitative, cannot be used to evaluate changes in antibody titer, and hence are not useful for serological confirmation. IgM tests are not strongly supported for use in serodiagnosis of acute disease, as the response may not be specific for the agent (resulting in false positives) and the IgM response may be persistent. Complement fixation (CF) tests and other older test methods are neither readily available nor commonly used. CDC uses in-house IFA IgG testing (cutoff of $\geq 1:64$), preferring simultaneous testing of paired specimens, and does not use IgM results for routine diagnostic testing.

Recently, a growing number of case reports have included commercial laboratory results as supportive evidence. For example, the previous case definitions have used the word “antibody.” A review of testing protocols and reagents distributed to the state laboratories reveal that these existing tests were specific for IgG-class immunoglobulins. With the increased availability of IgM testing at commercial laboratories, it becomes necessary to clarify the traditional meaning of the word “antibody” as used in all previous definitions and routinely used by rickettsial laboratories. The use of IgM is less supported by scientific evidence, and actually is complicated by false negatives when IgG is present and false positives when rheumatoid factor or cross-reactive, non-rickettsial, antibodies are present. Thus, IgM testing cannot be recommended for confirmation of cases at this time.

 **Acute and convalescent sera from reported cases must be sent to the Bureau of Public Health Laboratories for confirmatory testing.**

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