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Ehrlichiosis and Anaplasmosis  
2008 Case Definition  
Ehrlichiosis and Anaplasmosis  
2008 Case Definition  
NOTE:  
A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance. Surveillance case definitions enable public health officials to classify and count cases consistently across reporting jurisdictions. Surveillance case definitions are not intended to be used by healthcare providers for making a clinical diagnosis or determining how to meet an individual patient’s health needs.  
CSTE Position Statement(s)  
09-ID-15  
Subtype(s)  
Anaplasma phagocytophilum  
infection  
Ehrlichia chaffeensis  
infection  
Ehrlichia ewingii  
infection  
Undetermined human ehrlichiosis/anaplasmosis  
Clinical Description  
Clinical presentation: A tick-borne illness characterized by acute onset of fever and one or more of the following symptoms or signs: headache, myalgia, malaise, anemia, leukopenia, thrombocytopenia, or elevated hepatic transaminases. Nausea, vomiting, or rash may be present in some cases.  
Clinical evidence: Any reported fever and one or more of the following: headache, myalgia, anemia, leukopenia, thrombocytopenia, or any hepatic transaminase elevation.  
Exposure  
History of having been in potential tick habitat in the 14 days prior to the onset of illness or history of tick bite or history of tick bite.  
Subtype(s) Case Definition  
Expand All  
Anaplasma phagocytophilum  
infection  
Laboratory Criteria For Diagnosis  
Supportive:  
Serological evidence of elevated IgG or IgM antibody reactive with  
A. phagocytophilum  
antigen by IFA, enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or assays in other formats (CDC uses an IFA IgG cutoff of ≥1:64 and does not use IgM test results independently as diagnostic support criteria),  
OR  
Identification of morulae in the cytoplasm of neutrophils or eosinophils by microscopic examination  
Confirmed:  
Serological evidence of a fourfold change in IgG-specific antibody titer to  
A. phagocytophilum  
antigen by indirect immunofluorescence assay (IFA) in paired serum samples (one taken in first week of illness and a second 2-4 weeks later),  
OR  
Detection of  
A. phagocytophilum  
DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay,  
OR  
Demonstration of anaplasmal antigen in a biopsy/autopsy sample by immunohistochemical methods,  
OR  
Isolation of  
A. phagocytophilum  
from a clinical specimen in cell culture  
Ehrlichia chaffeensis  
infection  
Laboratory Criteria For Diagnosis  
Supportive:  
Serological evidence of elevated IgG or IgM antibody reactive with  
E. chaffeensis  
antigen by indirect immunofluorescence assay (IFA), enzyme-linked immunosorbent assay (ELISA), dot-ELISA, or assays in other formats (CDC uses an IFA Immunoglobulin G [IgG] cutoff of ≥1:64 and does not use Immunoglobulin M [IgM] test results independently as diagnostic support criteria),  
OR  
Identification of morulae in the cytoplasm of monocytes or macrophages by microscopic examination  
Confirmed:  
Serological evidence of a fourfold change in Immunoglobulin G (IgG)-specific antibody titer to  
E. chaffeensis  
antigen by indirect immunofluorescence assay (IFA) between paired serum samples (one taken in first week of illness and a second 2-4 weeks later),  
OR  
Detection of  
E. chaffeensis  
DNA in a clinical specimen via amplification of a specific target by polymerase chain reaction (PCR) assay,  
OR  
Demonstration of ehrlichial antigen in a biopsy or autopsy sample by immunohistochemical methods,  
OR  
Isolation of  
E. chaffeensis  
from a clinical specimen in cell culture  
Ehrlichia ewingii  
infection  
Laboratory Criteria For Diagnosis  
Confirmed:  
Because the organism has never been cultured, antigens are not available. Thus,  
E. ewingii  
infections may only be diagnosed by molecular detection methods:  
E. ewingii  
DNA detected in a clinical specimen via amplification of a specific target by PCR assay.  
Undetermined human ehrlichiosis/anaplasmosis  
Laboratory Criteria For Diagnosis  
See case classification  
Case Classification  
Suspected  
A case with laboratory evidence of past or present infection but no clinical information available (e.g., a laboratory report).  
Probable  
A clinically compatible case (meets clinical evidence criteria) that has supportive laboratory results. For ehrlichiosis/anaplasmosis – an undetermined case can only be classified as probable. This occurs when a case has compatible clinical criteria with laboratory evidence to support  
Ehrlichia/Anaplasma  
infection, but not with sufficient clarity to definitively place it in one of the categories previously described. This may include the identification of morulae in white cells by microscopic examination in the absence of other supportive laboratory results.  
Confirmed  
A clinically compatible case (meets clinical evidence criteria) that is laboratory confirmed.  
Comments  
There are at least three species of bacteria, all intracellular, responsible for ehrlichiosis/anaplasmosis in the United States:  
E. chaffeensis  
, found primarily in monocytes, and  
A. phagocytophilum  
and  
E. ewingii  
, found primarily in granulocytes. The clinical signs of disease that result from infection with these agents are similar, and the range distributions of the agents overlap, so testing for one or more species may be indicated. Serologic cross-reactions may occur among tests for these etiologic agents.  
Four sub-categories of confirmed or probable ehrlichiosis/anaplasmosis should be reported: 1) human ehrlichiosis caused by  
E. chaffeensis  
, 2) human ehrlichiosis caused by  
E. ewingii  
, 3) human anaplasmosis caused by  
Anaplasma phagocytophilum  
, or 4) human ehrlichiosis/anaplasmosis - undetermined. Cases reported in the fourth sub-category can only be reported as "probable" because the cases are only weakly supported by ambiguous laboratory test results.  
Problem cases for which sera demonstrate elevated antibody IFA responses to more than a single infectious agent are usually resolvable by comparing the levels of the antibody responses, the greater antibody response generally being that directed at the actual agent involved. Tests of additional sera and further evaluation via the use of PCR, immunohistochemistry, and isolation via cell culture may be needed for further clarification. Cases involving persons infected with more than a single etiologic agent, while possible, are extremely rare and every effort should be undertaken to resolve cases that appear as such (equivalent IFA antibody titers) via other explanations.  
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. Furthermore, IgM tests are not always specific and the IgM response may be persistent. Therefore, IgM tests are not strongly supported for use in serodiagnosis of acute disease.  
The 2008 case definition appearing on this page was re-published in the 2009 CSTE position statement 09-ID-15. Thus, the 2008 and 2010 versions of the case definition are identical.  
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