

07-ID-02

Committee: Infectious Disease

Title: Revision of the Surveillance Case Definition for Mumps

Statement of the Problem:

In 2006, the U.S. experienced the largest mumps outbreak in twenty years. Using the current CSTE mumps definition and classifications, states had difficulty in trying to quantify, classify, and report possible mumps cases. Due to this difficulty, there was inconsistency among states when applying the case classifications which resulted in an inability to assess the actual impact of disease. Additionally, problems with laboratory confirmation were identified during this outbreak. In light of the new information obtained during the outbreak, it became apparent that the case definition and classifications needed to be updated. The current case definition and classifications do not include acute mumps complications, suspected case definition or newer laboratory tests. In addition, the CSTE case classification of import status for measles, rubella and congenital rubella syndrome approved in 2006 is being applied to the mumps classification for import status.

Changes were made to the case definition, laboratory criteria and case classifications. For the case definition, a clinical description was added to include cases that may present with only complications. Changes to the laboratory criteria included the addition of detection of mumps nucleic acid. PCR testing is now available in several states. Due to the problems with the serologic testing, a more specific criterion for IgG testing was added.

For case classification, several changes were made. A suspect case classification was added so states have a category to use for cases that may not meet the probable or confirmed definition but that likely will once the case investigation is complete. For both probable and confirmed, the clinical symptoms include clinical case definition or acute complications consistent with mumps disease as noted in the clinical description. For confirmed case definition, symptoms are now required in addition to laboratory confirmation or epidemiological linkage to a confirmed or probable case. The previous confirmed case classification did not require symptoms with laboratory confirmation. When state health departments were evaluating mumps cases in 2006, there was debate as to the reliability of the serologic tests for immunoglobulin M that vary by manufacturer and by availability in each state. The sensitivity and specificity of mumps serologic test kits varies greatly and there is no current standardization for all state public health laboratories.

Studies suggest that serum IgM may be negative in up to 50-60% of acute serum samples among individuals who have been previously immunized. Thus, a case in a vaccinated person cannot not be ruled out on the basis of a negative IgM¹. For this reason, clinical symptoms consistent with mumps disease are now suggested for meeting the confirmed case classification.

The proposed definition was expanded by adding a clinical description to capture the clinical complications, but the definitions for case classification were made specific to increase the reliability of reporting true mumps cases. With mumps, it is essential that in the future states are able to readily identify cases using a uniform case definition sensitive enough to detect true cases and specific enough to rule cases attributable to other causes.

¹<http://www.cdc.gov/nip/diseases/mumps/faqs-lab-test-infect.htm>

Statement of the desired action(s) to be taken:

The following modified case definition, case classifications and case classification of import status will be implemented for mumps:

Clinical case definition:

- An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid and or other salivary gland(s), lasting at least 2 days, and without other apparent cause.

Clinically Compatible Illness:

Infection with mumps virus may present as aseptic meningitis, encephalitis, hearing loss, orchitis, oophoritis, parotitis or other salivary gland swelling, mastitis or pancreatitis.,

Laboratory criteria

- Isolation of mumps virus from clinical specimen, or
- Detection of mumps nucleic acid (e.g., standard or real time RT-PCR assays), or
- Detection of mumps IgM antibody, or
- Demonstration of specific mumps antibody response in absence of recent vaccination, either a four-fold increase in IgG titer as measured by quantitative assays, or a seroconversion from negative to positive using a standard serologic assay of paired acute and convalescent serum specimens.

Case classification

Suspected: A case with clinically compatible illness or meets the clinical case definition without laboratory testing, or a case with laboratory tests suggestive of mumps without clinical information.

Probable: A case that meets the clinical case definition without laboratory confirmation and is epidemiologically linked to a clinically compatible case. .

Confirmed: A case that 1. meets the clinical case definition or has clinically compatible illness , and 2. is either laboratory confirmed or is epidemiologically linked to a confirmed case.

Comment: With previous contact with mumps virus either through vaccination (particularly with 2 doses) or natural infection, serum mumps IgM test results may be negative; IgG test results may be positive at initial blood draw and viral detection in RT-PCR or culture may have low yield. Therefore, mumps cases should not be ruled out by negative laboratory results. Serologic tests should be interpreted with caution, as false positive and false negative results are possible with IgM tests.

Case Classification for Import Status

Internationally imported case: An internationally imported case is defined as a case in which mumps results from exposure to mumps virus outside the United States as evidenced by at least some of the exposure period (12–25 days before onset of parotitis or other mumps-associated complications) occurring outside the United States and the onset of parotitis or other mumps-associated complications within 25 days of entering the United States and no known exposure to mumps in the U.S. during that time. All other cases are considered U.S.-acquired cases.

U.S.-acquired case: A U.S.-acquired case is defined as a case in which the patient had not been outside the United States during the 25 days before onset of parotitis or other mumps-associated complications or was known to have been exposed to mumps within the United States.

U.S.-acquired cases are subclassified into four mutually exclusive groups:

Import-linked case: Any case in a chain of transmission that is epidemiologically linked to an internationally imported case.

Imported-virus case: A case for which an epidemiologic link to an internationally imported case was not identified but for which viral genetic evidence indicates an imported mumps genotype, i.e., a genotype that is not occurring within the United States in a pattern indicative of endemic transmission. An endemic genotype is the genotype of any mumps virus that occurs in an endemic chain of transmission (i.e., lasting ≥ 12 months). Any genotype that is found repeatedly in U.S.-acquired cases should be thoroughly investigated as a potential endemic genotype, especially if the cases are closely related in time or location.

Endemic case: A case for which epidemiological or virological evidence indicates an endemic chain of transmission. Endemic transmission is defined as a chain of mumps virus transmission continuous for ≥ 12 months within the United States.

Unknown source case: A case for which an epidemiological or virological link to importation or to endemic transmission within the U.S. cannot be established after a thorough investigation. These cases must be carefully assessed epidemiologically to assure that they do not represent a sustained U.S.-acquired chain of transmission or an endemic chain of transmission within the U.S.

Note: Internationally imported, import-linked, and imported-virus cases are considered collectively to be import-associated cases.

Comment: Currently, there is insufficient information to determine whether any mumps strains are endemic to the United States or to distinguish endemic from non-endemic strains...

Note: States may also choose to classify cases as “out-of-state-imported” when imported from another state in the United States. For national reporting, however, cases will be classified as either internationally imported or U.S.-acquired.

Public Health Impact:

The changes in the case definition and classifications of mumps will provide states a mechanism to report mumps consistently, using newer laboratory methods available and atypical clinical presentations. Consistent application of criteria and reporting will facilitate a clearer understanding of the current epidemiology of mumps. The addition of the importation status will allow identification of the origin of cases that are brought into the country.

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