State of Alaska Epidemiology Bulletin

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False Positive Laboratory Test Results for Measles-- Some Disease Actually Parvovirus B19

Between June 1 and November 1, 1994 the Section of Epidemiology investigated 57 persons with febrile rash illness. Serum for rubeola-specific IgM antibody testing was obtained from 55 of these. After reporting 10 rubeola cases (8 of whom were rubeola IgM positive) in Epidemiology Bulletin no. 21 (9/14/94), 8 other individuals with febrile rash illness were found to be rubeola IgM antibody positive at the State Public Health Laboratory, Fairbanks (SPHL). The State Laboratory employed a widely used commercial test kit approved by the U.S. Food and Drug Administration for rubeola IgM testing.

After noticing that several of the 16 IgM positive cases did not have a constellation of symptoms or risk factors usually seen with measles, the Section of Epidemiology arranged for all positive specimens (as well as a control group of 10 specimens which tested IgM negative at the SPHL) to be sent to the Centers for Disease Control and Prevention (CDC) for confirmatory testing. The CDC used methodology developed in-house to examine each specimen for both rubeola and parvovirus B19 (Fifth disease) IgM antibody.

Results

Eight of the 16 persons who tested measles IgM antibody positive at the SPHL were also positive at the CDC. Three specimens which were rubeola IgM negative at the CDC were found to be positive for parvovirus B19 IgM antibody. The 10 control specimens which were rubeola IgM negative at the SPHL were also negative at CDC.

We reviewed each of the 16 persons who were rubeola IgM positive at the SPHL to determine whether or not they met a clinical case definition of measles (Table 1). Seven of the eight persons who were rubeola IgM positive at CDC met the clinical case definition while only one of the eight persons who was IgM negative at CDC (and positive at the SPHL) met the case definition (Fisher exact 2-tailed p=0.01).

Table 1. Clinical case definition for rubeola

An illness characterized by ***all*** of the following features:

1. Generalized rash lasting at least 3 days.
2. Temperature of at least 38.3° C (101° F).
3. Cough, or coryza, or conjunctivitis.

As a result of these findings, we have deleted five of the measles cases (nos. 6-10) listed in Table 1 of Epidemiology Bulletin no. 21. This leaves 10 persons who were counted as cases of measles (Table 2). All but case no. 14 met the clinical case definition. In addition to the eight cases who had a positive confirmatory test at CDC, two cases (nos. 2 and 15) who were not serologically tested were epidemiologically linked to confirmed cases.

Of the 10 measles cases, 2 (nos. 1 and 3) were vaccine failures; both were 24-year-old women who had received measles-rubella vaccine in 1970 at 24-25 months of age. Case no. 1 had also received a single antigen measles vaccine at age 13 months instead of measles-mumps-rubella (MMR) vaccine.

DISCUSSION:

Several potential cases of measles were initially identified in school age children, leading to extensive follow-up at several schools. **Further evaluation of these students found no cases among school age students except for one unvaccinated 16-year-old (case no. 4).**

It appears that a commercial test kit in widespread use nationally to test for acute rubeola antibody (IgM) yields false positive results. Many of the false positive results appear to be caused by acute infection with parvovirus B19. Because of this finding, the State Public Health Laboratory, Fairbanks has added a second, more specific, test to be run along with the usual commercial test kit. CDC is aware of this problem with the test kits.

RECOMMENDATIONS:

1. Children should be vaccinated with MMR vaccine at 15 months for protection from measles.
2. Febrile rash illnesses should be reported immediately to the Section of Epidemiology at 561-4406.
3. The Section of Epidemiology can assist in facilitating antibody testing (which is most accurate 4 or more days following rash onset).
4. The Section of Epidemiology is working with CDC to attempt to obtain isolates of the rubeola virus strain circulating in Alaska. In selected circumstances, we may request a throat swab from possible measles cases shortly after rash onset.
5. None of the cases identified during this outbreak would have been prevented by a two-dose policy for measles vaccine.
6. Positive rubeola test results lead to extensive and expensive epidemiologic investigations and public health control measures. Better laboratory tests are needed to reduce the number of unnecessary investigations.

Table 2. Selected characteristics of measles cases; June 1 - November 1, 1994, Alaska				
Case no.*	Date rash onset	Age	Place of residence	Vaccination status
1	June 19	24 years	Anchorage	Single antigen measles at 13 months; MR^{+} at 25 months
2	June 21	5 years	Kenai	Unvaccinated
3	July 6	24 years	Kenai	MR at 24 months
4	July 6	16 years	Anchorage	unvaccinated
5	July 10	43 years	Kenai	unvaccinated
11	Sept 5	14 months	Anchorage	unvaccinated
12	Sept 14	11 months	Anchorage	unvaccinated
13	Sept 16	30 years	Anchorage	unvaccinated
14	Sept 16	6 months	Anchorage	unvaccinated
15	Sept 26	19 months	Anchorage	unvaccinated

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