Southern Nevada Health District
Maternal TB Investigation – Brief Interim Report
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Overview

In July, 2013, a 25-year-old postpartum woman (case-patient) died and was subsequently diagnosed as having been infected with tuberculosis (TB). She had been admitted briefly at one Clark County hospital (Hospital A) for premature rupture of membranes then transferred to a second Clark County hospital (Hospital B) where she delivered extremely preterm-gestation twins (twin A and twin B) in May, 2013. She had been ill to varying degrees prior to and after the birth of her twins. Her condition worsened, and she was eventually admitted to Hospital B and later transferred to a Southern California hospital for a higher level of care shortly before her death. On autopsy, the diagnosis of TB meningitis was made. Review of hospital chart notes and discussions with family members was inconclusive as to whether or not the case-patient was likely to have been contagious during her illness.

Twin A died in June. Twin B remained hospitalized in Hospital B's Level III neonatal intensive care unit (NICU A). As soon as the hospital learned of the case-patient's diagnosis, Twin B was moved to a negative-pressure isolation room per hospital infection control policies and tested for TB. Twin B's test results were subsequently positive for TB. Despite having been started on TB treatment when the diagnosis of TB made, Twin B died in August.

Southern Nevada Health District Objectives

When the case of tuberculosis was reported, the Southern Nevada Health District (SNHD) immediately began an epidemiologic investigation to:

1. Determine whether or not the case-patient or her infants were contagious ("active TB")
2. Identify persons who might have been exposed to the patient for testing and treatment
3. Find the source case from whom the case-patient acquired TB

Findings – Diagnoses

SNHD reviewed autopsy records and laboratory results and consulted with the Centers for Disease Control and Prevention's (CDC) pathology department to determine infectiousness of the case-patient, Twin A, and Twin B.

Case-patient: CDC confirmed the diagnosis of tuberculosis meningitis, miliary tuberculosis, and pulmonary tuberculosis in the case-patient by pathologic and laboratory examination of post-mortem tissue. The examiners concluded that the case-patient should be considered to have been infectious at the time of her death. Because no clinical specimens were collected prior to death, it is impossible to know how long the patient could have been contagious prior to her death.

Twin A: The cause of death was noted to have been "respiratory failure due to extreme prematurity." Twin A died before TB was suspected as a cause of illness in either twin or in the case-patient. Because extreme prematurity was a plausible explanation for the twin's death, no autopsy was performed and no clinical specimens from Twin A were tested for tuberculosis.

Twin B: After the cause of the mother's illness was determined to have been TB, Twin B was also tested for the disease. Both sputum and gastric lavage specimens tested positive for acid-fast bacilli (AFB) and Twin B was also diagnosed with TB infection. Twin B died in August. The death certificate, signed by one of the neonatology physicians who had been providing care, lists "tuberculosis" as the cause of death.

Findings – Contact Investigation – Preliminary Results

Contacts of case-patient (family and friends): Sixty-nine close family members and friends were tested for TB. Thirteen of them had positive test results (7 of whom were foreign born), indicating that they have been exposed to TB, either recently or in the past. Two persons had abnormal chest X-rays. They are currently undergoing treatment at SNHD to protect them from developing active disease or passing the infection onto others.

Hospital staff*: Staff were prioritized for testing at the hospital according to how much contact they had with the case-patient or the twins. To date, overall, 155 staff members have been tested, of whom 4 staff members have been identified as having been exposed to TB, either recently or in the past. According to CDC's TB control guidelines, the hospital is currently working with SNHD to determine which persons require further evaluation and treatment. Five staff members' results are pending and 37 in the 'high-' or 'medium-priority' categories still remain to be tested.

> ***NICU A staff*** who cared for Twins A or B were mostly in the 'high-priority' group for testing. Forty-eight staff members were identified as needing to be tested; 46 tested negative, 1 had a previously positive TB test and a currently abnormal chest X-Ray but negative sputum tests, and 1 no longer works at the hospital and could not be reached.
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> ***NICU A Respiratory Therapists*** who cared for Twin B were mostly in the 'high-priority' group for testing. Eighteen staff members were identified as needing to be tested; 14 tested negative, 2 had newly positive TB results and are now undergoing evaluation by SNHD, 1 test result is pending, and 1 person no longer works at the hospital and could not be reached.
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> ***Emergency Room staff, ICU staff, Adult Respiratory Therapists, and Code-Team staff*** who cared for the case-patient were mostly in the 'high-priority' group for testing. Forty-two staff members were identified as needing to be tested; 37 persons tested negative, 1 had a newly positive TB result and is now undergoing evaluation by SNHD, 3 additional test results are pending, and 1 person no longer works at the hospital and could not be reached.
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> ***Physicians and Nurse Practitioners*** who cared for the case-patient were mostly in the 'medium-priority' group. Forty-seven clinicians were identified as needing to be tested; 18 had negative TB results and an additional 29 still need to be tested, including 8 in the 'high-priority' group.

Antepartum staff and Labor & Delivery staff at both Hospital A and Hospital B who cared for the case-patient prior to the period when we she was presumed to have been infections. Forty-two persons were identified as needing to be tested; 36 persons tested had negative TB test results, 1 additional test result is pending, and 5 other persons still need to be tested.

*from Hospital B, unless otherwise noted

Findings – Source Case

To date, contact investigation interviews have failed to uncover evidence of active TB in any persons known to have been in contact with the case-patient prior to her illness. Contact investigations continue.

Recommendations:

Based on our evaluation of all data available to us, we believe that the infants under care in the NICU A had minimal risk for exposure to tuberculosis. At this time, there is no medical or public health indication for conducting tuberculosis screening or diagnostic tests on any of the NICU A infants. Similarly, we believe that parents or visitors to the NICU A had minimal risk for exposure to tuberculosis; therefore, no tuberculosis screening or diagnostic tests on any of the parents and visitors is planned at this time.

It is highly unlikely that any staff member who had treated the case-patient or her twins has active (infectious) TB at this time. None has symptoms and the staff members whose TB tests were positive are being treated to prevent them from developing active disease. Therefore, they would not have been able to spread TB from any of these patients to other patients.

SNHD will continue to work with the hospital to ensure prompt completion of initial TB screening tests for the remaining 37 'high-' or 'medium-priority' hospital staff who had contact with the case-patient or Twin B up to the time when he was moved into a negative pressure room and other appropriate protections against TB were implemented. A second round of screening tests shall take place to ensure detection of illness that could have been transmitted to staff during the latter portion of Twin B's hospital stay. These more recent exposures to Twin B, if transmission of TB occurred, would not necessarily result in positive test results 8 to 10 weeks after the exposure occurred. SNHD will use the standard 2-month exposure window.

Even though we believe exposure potential to NICU A babies was minimal, we want to ensure that parents and providers (pediatricians) of these babies are aware of the findings of our investigation. Therefore, we are working with Summerlin Hospital to identify and notify them via letter. Upon completion of final TB screening of hospital staff (8 weeks after final exposure), we will send another letter with our final investigation conclusions and further recommendations.

SNHD will provide treatment to any persons for which treatment is indicated, according to CDC's TB guidelines. Finally, SNHD will continue its contact investigation to attempt to identify the original source of the illness.