MDR TB Exposure in a Neonatal Intensive Care Unit

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BACKGROUND
Kansas is a low-incidence state with a TB case rate of 1.1 per 100,000. MDR-TB is especially rare. An undiagnosed MDR-TB case resulted in a large contact investigation involving a hospital patient care areas including labor and delivery, a postpartum unit, and a neonatal intensive care unit (NICU). The absence of published guidelines specific to the evaluation of high-risk infants exposed to TB complicated the investigation.

METHODS
The data associated with TB transmission risk of the source case, environmental aspects of patient care areas and patient logs to identify potential sources of exposure were used to determine the direction and extent of the investigation. Tools and educational products were developed to guide the assessment of exposed NICU infants.

RESULTS
85 close contacts were identified and 82 (96%) completed evaluations. Of these, 10 contacts were TB exposed infants from the NICU. Developed tools and educational products were used to obtain essential clinical information in all infants. Primary opportunities were identified that could have led to the diagnosis of the mother of the NICU source earlier in the investigation.

CONCLUSIONS
Undiagnosed TB can result in large contact investigations. The risk and management were complicated by MDR-TB and difficulty with diagnosis of TB in infants. No published guidelines or educational tools exist to guide screening and management of exposed, high-risk infants. These tools are essential to successful screening and care of exposed infants.

CASE
Mother
29 year old E European diagnosed with TB 1 month postpartum
New cough May 2013 (4 months before delivery)
Smear + positive;
MDR mutations: rpoB, katG, embB and fabA
Culture - MTB resistant to INH (high level), rifampin, rifabutin, ethionamide, ethambutol and streptomycin

History of abnormal CXR since October 2010 at re-entry to U.S.
2.4 cm pulmonary nodule, sputum cultures negative x 3
October 2011: CXR - 3 cm cavitating nodule
October 2012: CT with contrast: thick walled 3.3 cm cavity with adjacent nodular densities

Infant
Infant born 9/10/2014 at term,
delivery complicated by terminal meconium, tight nuchal cord and shoulder dystocia
Admitted to NICU with respiratory distress, MRSA 29,900 and patches infiltrates on CXR
Treated with ampicillin and gentamycin x 7 days
Mother travelled infant and “nurse-in” prior to discharge to home
Discharged to home well with improved CXR
Well 10/23/2013 at time of mom’s MDR diagnosis

ABSTRACT
Mother Coordination of Public Health Response
29 year old E European diagnosed with TB 1 month postpartum.
Assessment of sites
Home: Six household contacts evaluated
Work: Worked with cooperative HR, noted many cubicles, small conference rooms, frequent work in teams
Hospital: Meeting with Executive team to establish trust and refine testing plan

RESULTS
Home: 6/6 household contacts were negative by QFT on initial and repeat testing
Newborn infant was negative, TST/IGRA negative, treated preventively with levofloxacin

INFANT MONTHLY MONITORING TOOL

DISCUSSION
Although the mother was diagnosed with strongly smear positive cavitary disease, no transmission was ever detected with any infants or other contacts in the home, work, or among healthcare workers.

CONCLUSION
Successful and complete contact investigations are often driven by well developed tools to guide the investigation. Tools developed throughout the process of this investigation will serve as models that may be adapted in future investigations involving high risk infants.

Leveraging resources contributed to the successful response