MULTI-GENERATIONAL FAMILY TUBERCULOSIS (TB) OUTBREAK IN NEW YORK CITY

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BACKGROUND: PATIENT X

- In January 2016, a 5 year-old US-born male (Patient X) was confirmed to have acid-fast bacilli (AFB) smear-negative, brain and cerebrospinal fluid culture-positive, drug-susceptible, meningeal TB
  - A source case investigation was initiated per routine BTBC protocols
  - All identified household (5) and non-household family members (3) were evaluated; none had active TB disease
- During case management, BTBC staff identified a hospital visitor as Patient X’s great aunt, who self-reported history of TB disease (Patient Y) and was identified as a member of a large extended family (Family A) with extensive history of TB in NYC

BACKGROUND: FAMILY A

- Between January 1985 and December 2015, 12 Family A members were identified in NYC with active TB disease; several had multiple TB episodes
- Most recent prior TB case among Family A was identified in August 2015 (Patient Z)
- All TB cases among Family A for whom complete genotype results were available had matching strains by RFLP and spoligotype (Cluster A)
FAMILY TREE AND KNOWN TUBERCULOSIS HISTORY AMONG FAMILY A, JANUARY 1985-DECEMBER 2015

Number of episodes of TB disease (circle size)

FAMILY TREE AND KNOWN TUBERCULOSIS HISTORY AMONG FAMILY A, JANUARY 1985-DECEMBER 2015

NUMBER OF CLUSTER 13 TB CASES BY YEAR COUNTED AND KNOWN AFFILIATION WITH FAMILY A, JANUARY 1985 TO JUNE 2016 (N=79)

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OUTBREAK INVESTIGATION OBJECTIVES AND ACTIVITIES

- Identify undiagnosed case(s)
- Identify potentially-exposed individuals and sites of transmission

Who:
1. Contacts to current cases
2. Previously-identified contacts to Family A cases
3. Previously unidentified contacts to Family A cases
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How:
- Previous contact investigation and case management notes
- Interviews with patients and family members
- Medical chart review
- Database searches (municipal healthcare & social service databases, Citywide Immunization Registry, Lexus Nexus, vital records)
- Social media (e.g., Facebook, YouTube)

OUTBREAK INVESTIGATION OBJECTIVES AND ACTIVITIES

- Ensure appropriate evaluation and treatment for all exposed individuals
  - Offer short-course treatment regimens and DOPT
  - Recommend treatment for newly-exposed, previously-treated contacts with history of TB infection or TB disease
  - Engage family members and other stakeholders
  - Collaborate with community healthcare providers
  - Emphasis on patient (re-)education and empowerment
- Identify possible epidemiologic links between Family A and other cluster cases

FAMILY TREE AND KNOWN TUBERCULOSIS HISTORY AMONG FAMILY A, JANUARY 1985-DECEMBER 2015

- History of TB disease
- History of TB infection
- No known history of TB infection or disease
- Number of episodes of TB disease in Kindred
RESULTS

- One additional TB case and 45 new contacts related to Family A members were identified
- One definite epidemiologic link (social network) was identified between Family A and another cluster patient
  - Contact investigation efforts expanded to include leisure contacts
- Contacts with newly-diagnosed TB infection or history of TB infection or disease were offered short-course treatment and directly observed preventive therapy
  - Evaluation and treatment are ongoing
- MIRU results helped to differentiate possible transmission chains
  - Supports hypothesis of transmission among Family A members

CONCLUSIONS

- Complicated family dynamics, numerous exposures and disease episodes among family members, and reluctance to adhere to treatment recommendations and name contacts challenged TB prevention efforts and required extensive local resources
- Providers should consider re-infection among individuals with previously-treated TB following new exposures
- Patient interviews and non-traditional data sources were vital to establishing epidemiologic links and identifying additional contacts
- WGS may help to further clarify transmission dynamics among family members and other cluster patients
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