Detection of a Cluster of Nontuberculous Mycobacteria at a Tuberculosis Hospital: A Quality Assurance Intervention

Quratulain Kizilbash MD, MPh, Kenneth Jost, Jr. M (ASCP), Lisa Armitige, MD, PhD, David Griffith MD, Denise F. Dunbar M (ASCP), Thomas L. Schlenker MD, MPh, Barbara Seaworth MD

Background: Non tuberculous mycobacteria (NTM) are widely distributed in soil and water. Texas Center for Infectious Disease (TCID), a hospital for patients with confirmed tuberculosis (TB) and San Antonio Metro Health (SAM), a clinic serving patients with suspected or confirmed TB, share the same water supply. After a cluster of isolates of Mycobacterium gordonae was noted at patients at TCID, a quality assurance intervention reviewed the protocols for both TCID and SAM.

Methods: All sputa collected for AFB culture from diagnostic TB patients at TCID and SAM during 2014 were included. Sputum samples were processed at the Texas Department of State and Health Services (DSHS) Laboratory.

Results and Findings: A total of 2,054 sputum samples were processed: 1,288 (62.74%) from TCID and 766 (37.26%) from SAM. Only 150 (5.7%) and 33 (4.3%) from TCID and SAM respectively were contaminated. Only NTM grew from 55 (4.27%) and 21 (2.75%) from TCID and SAM respectively. M. gordonae accounted for 28 of 55 (50.91%) of the NTM at TCID and only 1 of 21 (4.76%) at SAM. No patients had evidence of NTM disease. Review of protocols revealed inconsistencies, such as sampling and storage. No protocols were in place for transport of sputum to the laboratory which may have increased the recovery of NTM. Sterile water was not used to rinse the mouth by either facility.

Conclusion: Neither the hospital nor the clinic had adequate protocols. A breach at TCID accounted for the increase in M. gordonae isolates. The percentage of contaminated sputa was lower at TCID and SAM than the DSHS Laboratory average of 1.3%. The laboratory in areas where tap water or bottled water contains NTM, the use of sterile water to rinse the mouth prior to collection of sputa should be recommended.

Introduction

- NTM are acid fast positive bacilli which include over 150 species and are widely distributed in soil and water.
- NTM can colonize plumbing systems and may colonize the lungs without causing disease.
- Although drinking water, including bottled water, is usually treated, NTM are often resistant to first and second line TB drugs when tested at the DSHS Laboratory.
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Sputum Collection Protocols

TCID: Sputum specimens are collected on weekdays mostly unobserved starting at 5am. Patients are given instruction to breathe deeply to loosen secretions, cough forcefully and expel sputum into the container. Patients are instructed not to drink liquids (including water) prior to sputum collection. Specimens less than 3ml or mainly containing saliva are discarded. Specimens are transported to lab within 2 hours or refrigerated. A separate protocol for induced sputum is present.

SAM: Collection of first sputum specimen is observed and the remaining two specimens are collected at home, unobserved. No other written or verbal instructions are present for sputum collection although verbal advice is provided to the patients.

Discussion

- Failure to label the sputa correctly hampered our ability to evaluate contamination.
- Hospital plumbing should be designed to avoid features that foster growth of NTM and other organisms.
- Construction of TCID was completed in 2010 and plumbing is unlikely to be the cause of the cluster of M. gordonae.
- 11 NTM detected over a two day period were related to a variance in practice, however, the documentation was inadequate to explain this any further.
- A 2% final NaOH concentration is used to decontaminate all specimens at DSHS Laboratory which is at the upper limit of what is recommended.
- Increased frequency of disinfection and decrease isolation of rarely pathogenic NTM.

Conclusion

- A breach in protocol possibly occurred. We were alerted that patients drank water with medications prior to sputa collection on 9/28 and 9/29. This may have been responsible for the spike in M. gordonae isolates.
- In spite of increased incidence of NTM in San Antonio, we found overall low contamination rates and NTM recovery from specimens compared to other Texas providers.
- A modified (lower %NaOH) process for decontamination of specimens that arrive to the lab between 24 to 48 hours can be considered.
- A courier to allow health clinics throughout Texas to get specimens sent overnight and improve transit time would decrease the contamination rate.
- Rinsing the mouth with sterile saline prior to sputum collection in areas where tap and bottled water contain NTM is recommended, as per lab guidelines, in order to further reduce contamination and decrease isolation of rarely pathogenic NTM.

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