Failure of dry mist of hydrogen peroxide 5% to kill Mycobacterium tuberculosis

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Background: Multi-drug-resistant (MDR), or extensive drug-resistant (XDR) strains of M. tuberculosis are increasing, resulting in spread of infections, extremely difficult to treat. M. tuberculosis may survive in the environment for up to a year if not exposed to sunshine (or ultraviolet light). Enhanced environmental cleaning and disinfection is therefore important in the hospital environment to control the spread of infection. Disinfectants like chlorine and 5% chlorine, used for decontamination of surfaces, medical equipment and ambulances. DMHP has also been tried against M. tuberculosis as a routine decontamination. The effect of DMHP on M. tuberculosis is studied at Oslo University Hospital - Ullevål, Norway.

Methods: Mycobacterium tuberculosis strain CCUG 37357 was subcultured in Löwenstein Jensen (LJ) medium. A final dilution of 3 x 105 CFU/ml was added to each of 20 plastic agglutination wells and and dried at room temperature for 2 h. 10 samples were placed in room temperature in laboratory A and the other 10 were placed in a separate decontamination room B and treated with 3—6 cycles with dry mist hydrogen peroxide (H2O2 5%, Sterinis, Gloster Sante) during the night. Ppm of H2O2 and spore tests were monitored during the experimental period. Controls and treated samples were eluated and grown for 4 weeks in parallel LJ and Bactec media. Four separate, repeated experiments were performed during a period of 60 days, using three decontamination cycles in two experiments and six cycles in two. The results were only read as growth or no growth.

Results: Growth of M. tuberculosis was observed in all broth media (Bactec) and was present in Löwenstein Jensen (LJ) medium, both in controls and in treated samples. All spore control tests were negative. The ppm level reached during each cycle was high. No significant decontamination effect could be observed on bacteria grown on LJ media, neither after 3 nor 6 decontamination cycles with DMHP (5%).

Conclusion: A dry mist of hydrogen peroxide; DMHP (Sterinis) had no significant decontamination effect on air-dried samples of Mycobacterium tuberculosis.

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Outbreak of methicillin-sensitive Staphylococcus aureus joint infections associated with magnetic resonance arthrograms performed at a single outpatient radiology center-Los Angeles County, California, USA, 2009

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Background: Septic arthritis after arthrography is rare. In May 2009, the Los Angeles County Department of Public Health investigated an outbreak of joint infections after patients received magnetic resonance arthrograms (MRAs) from one outpatient radiology center, Facility A, during a 5-day period.

Methods: Prospective and retrospective outbreak investigations were done, including interviewing radiology staff, observing procedures, and reviewing medical records from 27 April through 1 May 2009. We defined confirmed cases as patients from Facility A who had MRAs and septic arthritis with positive synovial fluid cultures and possible cases as patients from Facility A with acute onset of new joint pain after MRA requiring further medical evaluation.

Results: Seven case-patients were identified (5 confirmed, 2 possible) out of 15 who received MRAs (attack rate = 47%). Average onset time of new acute joint pain symptoms following the MRA was 1.1 days (range 1—2 days). Five knees and two shoulder joints were affected. Both possible case-patients required emergency department (ED) evaluation. Synovial fluid cultures on confirmed case-patients grew methicillin-sensitive Staphylococcus aureus (MSSA), requiring hospitalization and surgical arthroscopic incision and drainage, peripherally inserted catheter placement, and 6 weeks of intravenous antibiotics. Average length and cost of hospitalization was 10.8 days (range 5–16 days) and $140,000. Two radiologic technologists routinely prepared contrast media for intra-articular injection. Contrast media and MSSA synovial fluid isolates were not available for further testing. We observed multiple breaches in aseptic technique during preparation of contrast media and improper multidose use of single-dose contrast media vials on multiple patients for cost-savings purposes.

Conclusion: One third of patients developed septic arthritis during a 5-day period following MRAs at a single outpatient radiology center and 47% required hospitalization or ED evaluation. This outbreak was likely caused by lapses in infection control, providing opportunity for extrinsic contamination of a single-dose contrast media vial which was misused as a multidose vial and resulted in significant morbidity and costs. The case-patients were clustered temporarily with MSSA joint infection, making a localized point source most likely. No new case-patients were identified after corrective actions were instituted. This outbreak highlights the need for infection control monitoring particularly in outpatient settings which lack formal oversight.

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