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EMPLOYEE TRAINING DOES MATTER: A SYSTEMATIC EVALUATION OF THE APPLICATION OF HFMEA IN INSTRUMENT STERILIZATION PROCEDURES

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Purpose: The quality of medical equipment sterilization plays an important role in infection control in hospitals. Although the staffs from medical equipment supply rooms are the main people who respond to provide clean and aseptic equipment, it also relies on all the staff whoever has a chance to use these equipments to improve the patient safety. Therefore, this study aims to provide evidence that the employee training on the whole concept of aseptic validation needs.

Methods: A medical center in the central Taiwan is chosen in this case study. Survey is adopted with stratified random selection, and 40 samples are selected from all employees with the seniority over one year. HFMEA is adopted to evaluate the entire equipment sterilization process. A hazard analysis and Decision Tree are used to identify the potential failure modes and causes which to improve.

Results: The first part of results shows that there are 57 failure modes and 132 causes of failure and these exist in the whole instrument sterilization procedure. The reasons are mostly human errors including the lack of the cognition on precaution and professional knowledge, busyness, carelessness, cost saving, unsuitable packages and so on. The second part of results shows that the complete knowledge of equipment sterilization procedure is required and it reduces the defect-free rate from 49% to 3.7%.

Conclusions: The HFMEA methodology is acknowledge as being a predictive way of risk management. Multiple significant errors can be identified and actions can be developed before its occurrence to improve medical quality and protect patient safety.

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ACTIVE SURVEILLANCE OF AUTOMATED ENDOSCOPE WASHERS TO PREVENT HEALTHCARE ASSOCIATED INFECTION

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Purpose: Four of 55 endoscopes were incidentally colonized by *Mycobacterium mucogenicum* group in October, 2013. ICPs began to investigate the origin of contamination.

Methods: The inner channel of 55 endoscopes and collected the fluid for cleaning and disinfection for these endoscopes, tap water, chlorohexidine solution, and rinse water in the AEW (automated endoscope washer) were collected for bacterial and mycobacterial cultures. PFGE was used as a molecular epidemiology tool.

Results: We supposed that the source of water contaminate were inside the inner pipeline system of AEW. After changing the inner pipeline system, the colony forming units of rinse water of AEW were not countable. Furthermore, we got these isolates for molecular epidemiological analysis. The phylogenetic pattern of these isolates showed a diverse pattern (Figure).

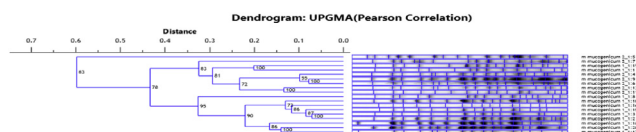


Figure. Phylogenetic tree of 18 *Mycobacterium mucogenicum* group isolates.

Conclusions: *M. mucogenicum* group causes the pseudoinfection due to a contaminated AEW. Formation of biofilms, which are resistant to chemical disinfectants. Active environmental surveillance is an important process to prevent HAIs.

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SURVEILLANCE ON THE PRESENCE OF EXTENDED – SPECTRUM B – LACTAMASE – PRODUCING ENTEROBACTERIACEAE AMONG HEALTHY ADULT POPULATION IN QUEZON CITY, PHILIPPINES

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Purpose: Extended – spectrum B – Lactamase – producing *Enterobacteriaceae* (ESBL) is an emerging public – health concern (Pitout J.) 2008. It was in the 1990s when the public began to take real notice of antibiotic – resistant bacteria.

In 2013, one of the main concerns of all Member states of the WHO South – East Asia Region (SEAR) was the growing importance of Antimicrobial Resistance, making utmost priority to preserve the efficacy of antibiotics in the fight against microbial diseases.

In Philippines, studies on the prevalence of extended – spectrum B – Lactamase – producing *Enterobacteriaceae* (ESBL) are still limited as reported in the study of Tian et.al. In 2010. In present study, stool samples among adults who were required for routine laboratory test as part of their pre – employment were collected for phenotypic, sensitivity and bacterial identification of ESBL producing *Enterobacteriaceae*.

Methods: Phenotyping, sensitivity testing and bacterial identification were done for the 30 positive samples. Clinical isolates that were suspected to produce ESBL based on the disk diffusion method were measured following the 2013 CLSI standard – susceptibility testing for *Enterobacteriaceae*.

Results: As to the demographics of the participants, 68% male and 32% female, age group 32% in 20 – 25 age class, and the lowest is 14% from less than 20 years old. Out of the 50 samples, 30 were positive for growth on Mac Conkey Agar with Cefotaxime. Of the 30 isolates: Highest sensitivity is from Cefepime (FEP) with 30% (100%), followed by Aztreonam (ATM) with 29 (97%), Ceftazidime (CAZ) with 27 (90%), and Cefotaxime (CTX) with 21 (70%). An 8 (27%) intermediate result was noted with Cefotaxime which is the highest among the antibiotics used. For the bacterial identification, 50% (15) of the total isolates were *Escherichia coli* followed by *Enterobacter aerogenes* with 33% (10), *Serratiamarscesens* with 13% (4) and *Citrobacter freundii* with only 1% (1).

Conclusions: There is no significant difference between the bacterial growth and demographic of the participants. Also, none of the samples were confirmed positive as ESBL by phenotypic testing. Furthermore, the group is continuously performing surveillance regarding ESBL producing *Enterobacteriaceae* among healthy population in Quezon City and other populated cities in Manila, Philippines.

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TWO-YEAR EXPERIENCE OF ACTIVE SURVEILLANCE FOR CARBAPENEM-RESISTANT ENTEROBACTERIACEAE AFTER CARBAPENEM-RESISTANT KLEBSIELLA PNEUMONIAE OUTBREAK IN MICU OF A REGIONAL TEACHING HOSPITAL

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Purpose: Demonstrate the result of 2-years' active surveillance of possible CRE (carbapenem-Resistant Enterobacteriaceae) carries for all new patients admitted to the intensive care units of a regional teaching hospital after an episode of CRKP (Carbapenem-Resistant Klebsiella Pneumoniae) outbreak in the MICU (Medical Intensive Care Unit).

Methods: There was an outbreak of CRKP in the MICU in February, 2012 (3 cases of bacteremia, 1 case of pneumonia, and 1 case of urinary tract infection) and caused two deaths. No definite person- or instrument-related cause was found after detailed work up and no further outbreak noticed thereafter. All isolates were confirmed positive for *Klebsiella pneumoniae* carbapenemase. Active surveillance of possible CRE carrier by rectal swab for every new patients admitted to the ICU was started and lasted for 2 years.

Results: CRE carrier rate was 9% in the beginning of active surveillance in the first quarter of 2012, and it dropped to around 1% in the first quarter of 2014. After outbreak, there was only one case of CRKP nosocomial infection in 2012 and no case of CRKP nosocomial infection in 2013 in MICU. The nosocomial infection incidence of MICU was 10.33%.