

initiative, it's absolutely helpful to enhance patient's safety. But considering the measures and needed for the characters and resources of the implementation of screening and subsequent isolation, all of this should develop policies to regulate the executing timing and isolation rules, then carry out after the specific and careful thinking. To improve the patient's safety and also make effective use of medical resources at the same time.

PS 1-177

DEPRESSION EFFECT OF USING COMPLEX-TYPE CHLORINE-BASED DISINFECTANT CLEANER SHEET FOR *CLOSTRIDIUM DIFFICILE* INFECTION

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Purpose: For infection control of *Clostridium difficile* infection (CDI), contact precautions in addition to standard precautions are validated effectiveness. Also, environmental cleanliness with sodium hypochlorite 0.1% (weight/volume) is particularly recommended for CDI. We introduced new environmental cleaning strategy to use complex-type chlorine-based disinfectant cleaner sheet RUBYSTA(R) (after call sheet) for high-contaminated environmental aspects, such as toilet and frequent contact surfaces, at least once a day in a unit at Kurume University Hospital. The purpose of this study is to determine the effect on introduction of the sheet by comparing the incidence of CD-positive patients before and after the introduction.

Methods: The sample was inpatients who diagnosed CD positive with a symptom of diarrhea in the period of April 2012 to March 2014. Clopper-Pearson Exact test was applied to determine 95% confidence interval (CI) of the incidence of CDI in order to compare pre-induction of the sheet (from April 1, 2012 through January 31, 2013) and after induction of the sheet (February 1, 2013 through March 31, 2014).

Results: The prevalence of CDI reduced after induction of the environmental cleaning with the sheet; the incidence rate of CD-positive with diarrhea was 17.169 (95% CI, 10 to 27) for pre-induction of the sheet and 10.470 (95% CI, 6 to 17) for after induction of the sheet. The incidence rate of CD-positive after induction of the sheet was decreased 41.4%.

Conclusions: In order to prevent incidence and outbreak of CDI, it is important to implement for continuing environmental cleaning with the sheet, more optimum infection control strategies, and appropriate antimicrobial stewardship in the whole hospital.

PS 1-178

CHARACTERIZATION OF MRSA ISOLATES FROM KAZAKHSTAN USING A MULTIPLE LOCUS VARIABLE-NUMBER TANDEM REPEAT ANALYSIS

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Purpose: Characterization the nosocomial and community-acquired of methicillin resistant *S.aureus* (MRSA) strains collected in Kazakhstan based on a Multiple Locus Variable-number Tandem Repeat Analysis (MLVA).

Methods: Thirty five MRSA (phenotypically proved) isolates of clinical or sub-clinical cases were collected in Kazakhstan (Astana, Karaganda, Zhezkazgan and Semey cities) from 2008 to 2014. MLVA typing was performed by using 6 tandem markers – SIRU 01, 05, 07, 13, 15 and 21 as described by Ikawaty et al., (2008). Each markers were amplified separately and were analyzed on 2% agarose gel (3% for SIRU21 marker). Isolates with single-locus variants were included in the same SIRU group and with 5-7 variants – clonal complex. For the assignment of an MLVA types and for calculation of discriminant power of typing method the Ridom MLVA Compare was used (Ridom GmbH, Wurzburg, Germany).

Results: 27 strains of MRSA obtained from hospitals, 6 isolates were outpatient and the sources of *S.aureus* were unknown in 2 cases. Among 6 SIRUs used in this typing method, no amplifications were detected for SIRU 01, 05, 07, 13 and 21 in 8.6%, 22.9%, 100%, 2.9% and 22.9% of the cases, respectively. Simpson index showed high discriminatory power of MLVA (0.939; 95% CI 0.886 - 0.993). According to MLVA, methicillin-susceptible strains of *S.*

aureus (n=35) were clustered to 14 types and were placed in 1 clonal complex including 4 SIRU groups (figure 1).

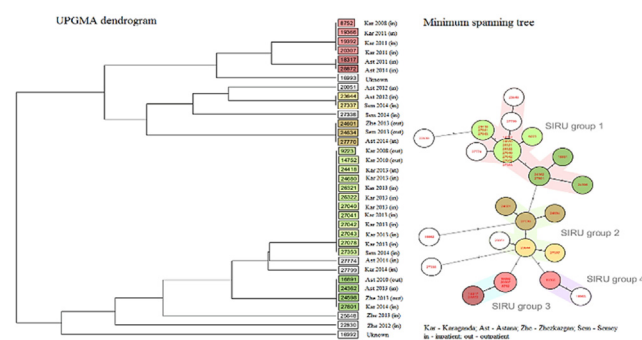


Figure 1 Clustering of MRSA based on MLVA.

Conclusions: Our study showed dissemination of MRSA belonging to one clonal complex with four SIRU groups regardless of the geographic location, source of infection, and time period.

PS 1-179

THE UTILIZATION OF BUNDLE CARE TO REDUCE CRAB RATIO

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Purpose: Conduct BUNDLE CARE mode to reduce Carbapenem-resistant *Acinetobacter baumannii* (CRAB) and examine the effectiveness of the implementation.

Methods: The CRAB BUNDLE CARE was performed in April, 2014, including the following items: 1. Enhance multi-drug resistance cognition, and conduct the educational training for the medical team, including the medical members, environmental services staff, nursing staff, the community members. 2. Implement contact isolation policies, develop audit approach, and monitor the admitted bed status, the bed labels, the exclusive equipment, hand hygiene, and isolated protection equipment of the multi-drug resistant patients. 3. Revise new outside environment audit approach, and the order and items of the sanitariums. Confirm the final disinfection results and compare Carbapenem-resistant *Acinetobacter baumannii* (CRAB) incidence after BUNDLE CARE execution.

Results: In April 2014, a total of 16 training sessions has been completed, which had 1162 person-time participating and 88 person-time of monitoring of clinical contact isolation measures. The implementation rate increased from 77% (Jan. – March) to 86% (April). By 48 cases of the development of environment monitoring in total, the sanitary execution rate increased from 27% to 83% under the improvement. Statistically, CRAB drug resistance ratio decreased from 61.6% to 53% under the improvement.

Conclusions: Through the implementation of CRAB BUNDLE CARE 1. Enhance multi-drug resistance educational training 2. Implement contact isolation policies 3. environment audit approach can reduce the ratio CRAB.

PS 1-180

EVALUATE AN ACQUISITION OF CARBAPENEM-RESISTANT ENTEROBACTERICEAE

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Purpose: Carbapenem-resistant enterobacteriaceae (CRE) are defined as enterobacteriaceae that are nonsusceptible to imipenem, meropenem, or doripenem; and resistant to third-generation cephalosporins, including cefotaxime, ceftriaxone, and ceftazidime. For *Proteus* spp., *Providencia* spp., and *Morganella morganii*, those must be also nonsusceptible to other carbapenems except imipenem. The incidence of CRE is increasing worldwide. This study was conducted to evaluate an acquisition of CRE.

Methods: At a regional hospital, from January 2011 to October 2014, all enterobacteriaceae isolates fulfilled CRE criteria were enrolled. If the isolates were from patients hospitalized for 2 days or longer, they were categorized as hospital-acquired infections (HAI). The remaining isolates were further categorized as nursing home-acquired infections (NHAI), if the patients were nursing home dwellers; healthcare-associated infections (HCAI), if the patients were readmitted within 90 days of discharge from a prior hospitalization; or community-acquired infections (CAI), if the patients came from the general community and did not fulfill HCAI or NHAI definition.

Results: A total of 68 CRE isolates were enrolled. Of all CRE, 38.2% (26/68), 36.8% (25/68), 13.2% (9/68), and 11.8% (8/68) of CRE were categorized as NHAI, HAI, HCAI, and CAI, respectively.

Conclusions: As a result of this study, 75 % (51/68) of CRE acquired from nursing home and hospital, especially the number of CRE was similar between nursing home and hospital. Accordingly, we suggest that monitoring CRE and intervention of infection control measures should extend to nursing home in order to reduce the incidence of CRE.

PS 1-181

THE MOST FREQUENT SPECIES OF CARBAPENEM-RESISTANT ENTEROBACTERICEAE AT A REGIONAL HOSPITAL

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Purpose: Carbapenem-resistant Enterobacteriaceae (CRE) is defined as Enterobacteriaceae resistant to any of carbapenems, including ertapenem, imipenem, meropenem, and doripenem. This study was conducted to explore the most frequent species of CRE.

Methods: This was a retrospective study at a regional hospital in southern Taiwan. From January 2013 to May 2014, all isolates of CRE reported from clinical microbiology laboratory were enrolled in this study. Antimicrobial susceptibility testing was performed by a standard disk diffusion method. The results were interpreted according to criteria recommended by the Clinical and Laboratory Standards Institute 2013 and 2014, respectively. All intermediate results were regarded as resistant in this study.

Results: A total of 80 CRE isolates were collected which included 42 (52.5%) *Klebsiella pneumoniae*, 12 (15%) *Escherichia coli*, 11 (13.8%) *Enterobacter cloacae*, 5 (6.3%) *Providencia stuartii*, 2 (2.5%) *Klebsiella ozaenae*, 2 (2.5%) *Enterobacter aerogenes*, 2 (2.5%) *Citrobacter koseri*, 1 (1.3%) *Enterobacter braakii*, 1 (1.3%) *Providencia rettgeri*, 1 (1.3%) *Klebsiella oxytoca*, and 1 (1.3%) *Morganella morganii*.

Conclusions: The most frequent species of CRE in this hospital were *K. pneumoniae*, *E. coli*, and *E. cloacae*. The three species accounted for 81.3% of CRE isolates. Not surprisingly, those are the frequent Enterobacteriaceae causing infections and using antibiotics for treatment in clinical practice. However, *E. coli* infections were more than *K. pneumoniae* infections, but the number of carbapenem-resistant *K. pneumoniae* was more than carbapenem-resistant *E. coli*. Hence, we think the reason why *K. pneumoniae* is the frequent species of CRE may be worth further investigations.

PS 1-182

EFFECTIVE THERAPY OF IMPENEM AND COLISTIN FOR PNEUMONIA CAUSED BY *KLEBSIELLA PNEUMONIAE* HARBORING *BLA*_{KPC-17} GENE: A CASE REPORT

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Purpose: *Klebsiella pneumoniae* carbapenemase (KPC) is one of the most common carbapenemases. KPC-2-containing *K. pneumoniae* (KPC-2-KP) has been the most worldwide spread and has arrived in Taiwan. Meanwhile, an outbreak of KPC-17-KP is ongoing in southern Taiwan. We report pneumonia caused by a KPC-17-KP strain.

Case report:

A 76 years old man of dementia had fever and pleural effusion. There were no chills, no chest pain, no abdominal pain and no nausea and vomiting. The consciousness was clear and BP showed 105/69mmHg. Laboratory data revealed WBC, 13,900/ μ L and C-reactive protein (CRP), 19.5 mg/L. Antibiotic of moxifloxacin was given. As unstable O₂ saturation, left lung consolidation and septic shock, antibiotic with piperacillin-tazobactam was prescribed, which was shifted to imipenem while sputum culture yielded *Escherichia coli* with extended-spectrum β -lactamase (ESBL-*E. coli*) phenotype. CRP increased to 188.3 mg/L. As hemodynamic instability depending on high-dose vasopressor and unstable O₂ saturation (SpO₂: 93-94%), the patient was intubated with ventilator support. We provided fluid resuscitation, vasopressor infusion, lung protective ventilation with low tidal volume and high PEEP. CXR showed partial resolution of consolidation with residual ground glass opacities. But WBC increased to 26,700/ μ L and procalcitonin was 27.4 ng/mL. Follow-up sputum culture yielded imipenem-resistant *K. pneumoniae*, which was later confirmed as a KPC-17-KP by PCR and DNA sequencing. In addition, he had intermittent spiking fever. Antibiotic imipenem was added colistin and then his condition was getting improvement. He was discharged uneventfully after 5 weeks of hospitalization.

Conclusions: We report a patient with ESBL-*E. coli* pneumonia followed by KPC-17-KP pneumonia after imipenem therapy. Combination of imipenem with colistin achieved a good clinical outcome.

PS 1-183

CONTROL OF MULTIPLE-DRUGS RESISTANT ORGANISMS (MDROs) in surgical ward of a general hospital in Hong Kong

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Purpose: There was increased of MRSA infections at the surgical ward since early 2013 and a VRE outbreak was reported in April 2013. This increased concerns and suggested to have improvement on infection control (IC) and caring practices. Then a quality IC program has been implemented to ward to control the MDRO infections.

Methods: 1. Enhanced staff's awareness by: briefing sessions, posting up related information (e.g. MDRO statistics), ICNs participated the departmental meetings.

2. Improved caring practices: Hand hygiene, procedures for bladder irrigation, catheter care for urology patients, wound care and dressing
3. Conducted patrols and audits on hand hygiene by IC link nurses and ICNs
4. Reinforced environment cleansing by using advanced cleaning /disinfection agent and conducting regular audits
5. Provided designated equipment such as stethoscopes, blood pressure monitors etc. for patients with MDROs
6. Enhanced the cleaning of linen and blankets for patients
7. Promoted patient's awareness on hand hygiene with slogans, leaflets, banner and offering of alcohol wipers for patients to disinfect hands

Results: 1. No MDRO outbreak reported from surgical ward since April 2013
2. MRSA rate decreased from the peak 2.5 (April 13) to 0.8 (April 14) per 1000 pbd

3. Staff hand hygiene compliance rate improved from 77% to 82%

Conclusions: With energetic IC strategies and supports from department heads and staffs, the spread of MDROs in ward was under control, the infection rates of MDROs were kept in low level and there was no outbreak reported.

PS 1-184

COMPARATIVE ANALYSIS OF DIFFERENT ANTIBIOTIC SUSCEPTIBILITY TESTS AMONG 670 *mecA*-POSITIVE MRSA ISOLATES FROM STERILE SITES (TIST STUDY, 2006–2010)

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Background: MRSA causes severe infections with considerable morbidity. Antimicrobial susceptibility test (AST) help physicians to choose appropriate