EXTENDED-SPECTRUM CEPHALOSPORIN RESISTANT ESCHERICHIA COLI IN RETAIL MEAT IN TAIWAN
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Purpose: Our national surveillance program indicated an increasing trend of extended-spectrum cephalosporin (ESC) resistance in E. coli from outpatients. Since antimicrobial resistant bacteria in the food supply may be transferred to humans through direct or indirect contact, we investigated the prevalence of ESC-resistant E. coli in retail meat in Taiwan.

Methods: Meat samples were purchased in 2012 and 2013 from traditional markets in different regions of Taiwan. One gram of the meat was incubated in 10 ml buffered peptone water overnight and 10 μl of the broth was subcultured to MacConkey and ESBL selective agar plates. After species confirmation, antimicrobial susceptibility was determined using broth microdilution method. Extended-spectrum β-lactamase (ESBL) confirmatory test was performed and the presence of ESBL and AmpC β-lactamase genes (blaESBL & blaCMY) was determined by PCR.

Results: A total of 95 (48 in 2012 and 47 in 2013) meat samples were studied. ESC-resistant E. coli isolates were detected in 60 samples (63.2%), including 30.4%, 80%, and 64.9% of the 23, 35, and 37 beef, chicken and pork samples, respectively. A total of 85 non-duplicate ESC-resistant isolates were recovered. blaESBL was detected in 68 isolates from 50 (52.6%) meat samples, all carried CTX-M type (groups 1 and 9), and 8 samples contained both CTX-M group 1 and group 9 isolates. blaCMY was detected in 18 isolates from 18 (18.9%) samples, all were CMY-type. Four isolates carried both blaCTX-M and blaCMY.

Conclusions: CTX-M ESBL-producing E. coli is highly prevalent in retail meat, especially in chicken and pork, the most often consumed meat types in Taiwan. CMY-type AmpC-producing E. coli are also present in meat supplies. Since CTX-M and CMY are the most frequently identified β-lactamases in human clinical ESC-resistant E. coli isolates in Taiwan, further studies to determine the relatedness of the clinical and meat ESC-resistant isolates are warranted.

STUDY ON THE HOMOLOGY OF ACINETOBACTER BAUMANNII BY ENTEROBACTERIAL REPETITIVE INTERGENIC CONSENSUS – POLYMERASE CHAIN REACTION
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Purpose: To investigate the homology of clinical isolated Acinetobacter baumannii and the epidemiology within the hospital and the possible transmission routes. In order to prevent transmission.

Methods: 73 isolates of non-repetitive multidrug resistant Acinetobacter baumannii were collected. The epidemiological typing was performed by enterobacterial repetitive intergenic consensus-polymerase chain reaction (ERIC-PCR).

Results: Genotypic analysis of these isolates revealed 8 distinct patterns, A (31), B (15), C (12), D (8), E (3), F (2), G (1), H (1). Pattern A was the dominating clone, distributed in different wards. ICU had 6 distinct patterns. Department of orthopedics had 4 distinct patterns, Emergency department had 5 distinct patterns. Internal medicine had 6 distinct patterns. Surgical department had 3 distinct patterns.

Table 1 The distribution of different sub-types of Acinetobacter baumannii.

<table>
<thead>
<tr>
<th>Ward</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<tbody>
<tr>
<td>ICU</td>
<td>10</td>
<td>7</td>
<td>5</td>
<td>5</td>
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<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Surgical</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
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</tr>
</tbody>
</table>

Conclusions: Acinetobacter baumannii spread in hospital. Acinetobacter baumannii has spreading ability.

THE EFFECT OF ANTIMICROBIAL STEWARDSHIP PROGRAMS ON HEALTH CARE ASSOCIATED INFECTION: A REGIONAL HOSPITAL EXPERIENCE
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Purpose: With the widespread use of antibiotics, management of multidrug-resistant organisms (MDROs) has become difficult problem in clinical medical treatment. As this reason, Department of Disease Control, Ministry of Health and Welfare bring up an Antimicrobial Stewardship Programs (ASP) strategy plan to encourage hospitals to join in order to expect better control the growing worse condition on 2014.

Methods: By participating in ASP plan in 2014, intervention period were 6 months, there are 5 key components of strict implementation: Hand decontamination pre-insertion, MDROs warning system, verify and reasonable use of antibiotics, correct collection specimen, active screen of MDRO patient for isolation, contact protection, and monitor environmental disinfection policy.

Results: The major findings of this plan compared with previous data revealed that MDROs rate: MRSA from 85.7% come down to 62.5%, VRE from 16.7% to 0.0%, CRAB from 60% to 40%, on the way of second line antibiotics daily define dose (DDD) decrease range: Teicoplanin 0.7%, Vancomycin 0.4%, and Imipenem 1.5%. Besides, contamination of specimen rate: blood from 5.2% to 3.6%, urine from 20.5% to 16.1%, and sputum from 18.5% to 10.6% It also elevated clinical diagnosis process.

Conclusion: ASP have been shown to enhance the quality of medical care, reduce DDD, antimicrobial resistance rate, contamination of specimen rate and thus medical costs. ASP should be ongoing and supportive strategies should be available to continue to make them more effect.

ANALYSIS THE RESULT OF SUSCEPTIBILITY TEST AND THE KPC GENE OF CRE IN A REGIONAL HOSPITAL OF SOUTH TAIWAN IN 2014
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Background: Analysis of Carbapenem-resistant Enterobacteriaceae (CRE) began since March 2011 in a regional hospital of south Taiwan. Total 107 cases of CRE was found since January 2014 to 10 November 2014. There was 42 cases which showed KPC gene.

Method: CRE was defined as that the culture of specimens showed enterobacteriaceae which presented resistant or intermediate in any sensitivity test. CDC was then reported and the microbial will send to Laboratory for PCR analysis of KPC gene.

Report: The result of the data in our hospital revealed that Enterobacteriaceae was at absolute to KPC gene testin which was susceptible to Imipenem. 42
strains showed positive to KPC gene test in 46 strains of resistance to imipenem:sensitivity rate:91.3%. 1 strains showed positive to KPC resistance test in the only case of intermediate result.

Conclusion: Positive resistance in imipenem-intermediate or imipenem-resistance of Enterobacteriaceae showed high risk of KPC gene. Therefor, isolation of such cases and environment sterilization was suggested for avoiding the spread of KPC strain.

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>No.</th>
<th>No. of KPC+ sensitivity rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella pneumonia</td>
<td>83</td>
<td>42 (50.6%)</td>
</tr>
<tr>
<td>Klebsiella oxytoca</td>
<td>1</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>22</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Citrobacter freundii</td>
<td>1</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

**PS 1-192**

MULTIDRUG-RESISTANT ACINETOBACTER BACTERIA DID NOT DEMONSTRATE INCREASED LETHALITY IN GALLERIA MELLONELLA INFECTION MODEL


Purpose: Multidrug-resistant Acinetobacter bacteria (MRAB) are important pathogen with the potential of causing nosocomial outbreaks. In this study, we aimed to investigate the lethality of a cohort of clinical and environmental MRAB in an invertebrate infection model.

Methods: Susceptible type strain of Acinetobacter baumannii ATCC 19606 was used as control. MRAB isolates were collected from surveillance samples from patients and hospital environmental surveillance swabs. The bacterial identities were confirmed by biochemical characteristics and by automated method with Vitek-2. Presence of colonial mucoidy was also noted. The isolates were tested for antibiotic susceptibilities according to CLSI methods and interpretations. Isolates which were resistant to beta-lactams, aminoglycosides, fluoroquinolones were included. Galleria mellonella larvae at the final instar (250 – 350g per larva) were used as the infection model. Ten microtitre of MRAB at 10^7/mL were injected into the left first proleg. Lethality was observed daily for 7 days. Sterile water and untraumatised larvae were used as control. Each set consisted of 10 larvae. All tests were done in duplicates.

Results: Eight strains of MRAB isolates were collected. Four from patients’ surveillance cultures, another four from environmental surveillance cultures. Two isolates each from the patients’ and environmental cultures were noted to be mucoid. All larvae infected with MRAB and the susceptible strain (ATCC 19606) survived up till day 7 of observation.

Conclusions: Lethality of Galleria mellonella larvae was not increased by the infection of susceptible or resistant Acinetobacter bacteria. It is also not affected by the origin of isolation (from patients or from environment), nor the presence of mucoidy. It is possible that these factors did not contribute to increase in virulence. However, a virulent strain of Acinetobacter bacteria needs to be established to confirm these findings.

**PS 1-193**

AN ANALYSIS OF CARBAPENEM RESISTANT ENTEROBACTERIACEAE, ASSOCIATED NOSOCOMIAL INFECTIONS, AND CONTACT ISOLATION MEASURES

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Introduction

With population aging in Taiwan, more and more elderly rely on long-term care facilities. Long-term care residents depend on mechanical ventilators, endotracheal tubes, or catheters for life extension but these devices increase the risk of infection. The over and improper use of antibiotics results in multiple drug-resistant strains.

Methods and results: Carbapenem resistant enterobacteriaceae (CRE) was collected from January 2013 to June 2014. There were 26 cases and 27 CRE strains were isolated. 24 Klebsiella pneumoniae (24/27 = 89%), and 3 Escherichia coli (3/27 = 11%) were isolated, including 6 strains with KPC gene (6/27 = 22%). The number of specimen from urine, wound, and sputum are 18, 4, and 5, respectively. In these 26 cases, 10 were from long-term care facilities. They were prolonged bed rest required and 5 of them with KPC gene. In addition, 14 cases were expired (14/26 = 54%), including 4 with KPC gene.

Conclusions: CRE infection usually results in increment of length of stay and mortality. In order to prevent the spread of resistant strains, Infection Control Center modified the infection control procedures as following, (1)to send the report of resistant strains to clinical unit, infection control unit, and physicians automatically; (2)to use the information system to assist the management of antibiotics; (3)to carry out the screening program of long-term care residents; (4)to follow up the bacterial culture of CRE cases; (5)to implement and check the disinfection of environment and equipment and to promote the hand hygiene actively; (6)to educate and assess the caregivers and family about the knowledge of infection control.

**PS 1-194**

THE EPIDEMIOLOGY OF C. DIFFICILE INFECTION IN WESTERN AUSTRALIA, 2011-2012

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Purpose: Clostridium difficile infection (CDI) is the most common cause of infectious diarrhoea in hospitalised patients. In Western Australia (WA) surveillance for CDI is mandatory for most hospitals and it is the only State in Australia that routinely ribotypes C. difficile strains isolated from hospital-identified CDI (HI-CDI). The aims of the study were to (i) describe the characteristics of HI-CDI cases, (ii) determine the rate of hospital-associated CDI (HA-CDI) by population characteristics, (iii) compare characteristics of HI-CDI cases and non-cases.

Methods: The study was a retrospective, population-based cohort study. CDI surveillance data from 01/07/2011 to 30/06/2012 were linked to records of admissions to WA hospitals over the same time period held in the Hospital Morbidity Data System. The incidence of HA-CDI was calculated as the number of HA-CDI episodes per 10,000 patient days (PD) per month.

Results: The study population consisted of 345,356 individuals aged >18 years who had at least one inpatient separation record in WA hospitals during the study period. The median age was 52 years (range 18-106 years); 29.8% of patients were aged >65 years and 55.9 % were female. There were 858 episodes of HI-CDI among 824 individuals. HA-hospital-onset (HA-HO) CDI accounted for 57.8%, HA-community-onset (HA-CO) for 13% and community acquired (CA) for 29% of infections. Ribotype 014/20 accounted for 30.6% of cases and was the most common strain in both HA and CA cases, followed by ribotype 002 (10%). The 12 month incidence of HA-CDI was 2.12/10,000 PD (95% CI 1.93-2.33) with a sharp increase in January 2012 for those age >50 years. Rates were highest in those with greater comorbidity.

**Figure 1. Incidence of HA-CDI by age group.**

Conclusions: This study describes detailed epidemiology of CDI in WA made possible by the linkage of surveillance, ribotype and hospitalisation data. A significant proportion of infections identified by hospitals was community-acquired, highlighting the need to undertake specific community-based studies.