International Journal of Antimicrobial Agents 50 S1 (2017) S75–S86

Contents lists available at ScienceDirect

International Journal of Antimicrobial Agents

journal homepage: www.elsevier.com/locate/ijantimicag

Abstracts of the 11th International Symposium on Antimicrobial Agents and Resistance and the 3rd International Interscience Conference on Infection and Chemotherapy (ISAAR & ICIC 2017)

BEXCO, Busan, Korea, September 14–16, 2017

Oral Presentations

September 15, 2017

O1-GP01

A multicenter study of clinical features and organisms causing community-onset cellulitis in Korea

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Background: Cellulitis is a common soft tissue infection in Korea. We investigated the clinical features and causative organisms among cases of community-onset cellulitis.
Methods: We retrospectively reviewed the medical records of patients who had been diagnosed as having cellulitis from 13 general hospitals between January 2014 and December 2015.
Results: In a total of 2208 patients, the proportion of male sex was 58.7% and the mean patient age was 51.5 years. The incidence of health-care-associated infection was 10.5% (231 of 2208). Of these patients, 56.1% were hospitalized and 15 (0.7%) died in the hospital. A total of 37.9% patients had comorbidities, the most common of which was diabetes mellitus (19.9%). The most common sites of cellulitis were the lower extremities (65.5%). Culture studies were done in 52.2% of the patients. A total of 355 pathogens were isolated from 314 patients (14.2%), and polymicrobial infection was found in 1.6% (35 of 2208). *Staphylococcus aureus* (162 isolates, 7.4%) was the most common organism, followed by *Streptococci* spp. (85 isolates, 3.8%), gram-negative fermenter (58 isolates, 2.6%), and gram-negative nonfermenter (23 isolates, 1.0%). Methicillin-resistant *S. aureus* (MRSA) was identified from 1.8% (39 of 2208) patients (community-acquired cases, 1.5% [29 of 1977] vs. health-care-associated cases, 4.3% [10 of 231]; $P = 0.005$).
Conclusions: MRSA is still an uncommon pathogen among Korean patients with community-onset cellulitis.

O1-GP02

Prevalence and antimicrobial resistance of methicillin-resistant and susceptible *Staphylococcus pseudintermedius* (MRSP) isolated from dogs in veterinary hospitals in Korea

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Background: Methicillin-resistant *S. pseudintermidius* (MRSP) is now considered as a serious threat to canine health. The purpose of this study was to investigate the prevalence, antimicrobial resistance profile, and clonal distribution of MRSP isolated from dogs in Korea.
Materials and Methods: A total of 59 *S. pseudintermidius* were isolated from dogs at three local and two veterinary teaching hospitals in Korea in 2012 (n = 41) and 2016 (n = 18). MRSP were determined by detection of the staphylococcal methicillin-resistant genetic determinant gene (*mecA*) by PCR. Antimicrobial susceptibility tests were performed by standard disk diffusion tests. Clonal relatedness of MRSP was analyzed by Multilocus sequence typing (MLST).
Results: Of 59 *S. pseudintermedius* isolates, 29 (49.15%) were identified as MRSP. Antimicrobial susceptibility tests revealed that all MRSP were multidrug resistant *S. pseudintermidius* showing resistance to three or more than three different classes of antimicrobials. All MRSP were resistant to penicillin, oxacillin, cefotaxime, and trimethoprim-sulfamethoxazole, but susceptible to vancomycin, amikacin, and rifampin. Out of 29 MRSP isolates typed with MLST, 17 distinct sequence types (STs) were identified: ST585 (n = 7), ST365 (n = 5), ST568 (n = 1), and 14 new STs (designated nST1 to nST14, two isolates belonged to nST1, and the others belonged to each nST, respectively). Interestingly, no predominant ST was found. Three of seven ST585 were isolated from three dogs living with a same owner, and all ST585 isolates were collected from a same university teaching hospital in 2012. However, ST362 were isolated from different places in different years (3 isolates in 2012, and 2 isolates in 2016).
Conclusion: Unlike the clonal spreads in North America and Europe, no dominant clone of MRSP was found in this study. Compared to a previous study, the results indicated a significant increase of prevalence in Korea. Therefore, more prudent use of antimicrobials in veterinary medicine is required to reduce the emergence and spread of MRSP in Korea.

O1-GP03

Minimum inhibitory concentration of vancomycin to methicillin resistant *Staphylococcus aureus* (MRSA) isolated at a tertiary care hospital in Sri Lanka

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Background: Methicillin Resistant *Staphylococcus aureus* (MRSA) has evolved as a serious threat to public health. It has the ability to cause hospital acquired and community acquired infections. Due to the multidrug resistance shown by MRSA, there are limited treatment options for the infections caused by this superbug. For the last decade incidence of vancomycin intermediate *Staphylococcus aureus* (*S. aureus*) and vancomycin resistant *S. aureus* (VISA and VRSA respectively) has been increasing in various parts of the world. The objective of the present study was to determine the minimum inhibitory concentration (MIC) of vancomycin to MRSA isolated from different clinical samples at a tertiary care hospital in Sri Lanka.
Methodology: A total 72 clinical isolates of *S. aureus* from different clinical samples received at Colombo South Teaching Hospital (CSTH), Sri Lanka from November 2016 to May 2017 were included in the study. *S. aureus* isolates were identified by Gram stain, colony morphology, catalase, slide/tube coagulase, DNase agar and latex agglutination tests. The antibiotic susceptibility tests were carried as per Clinical Laboratory Standards Institute (CLSI) guidelines. MRSA isolates were detected using the cefoxitin (30 μg) disk diffusion test. The vancomycin MICs were determined by the E-test method with a 0.5 McFarland standard inoculum. The MIC clinical breakpoints were defined according to the CLSI guidelines (susceptible, ≤2 μg/ml; intermediate, 4–8 μg/ml; and resistant, ≥16 μg/ml).
Results: Of the 72 *S. aureus* clinical isolates, 29 (40.2%) were MRSA. Minimum inhibitory concentrations of vancomycin to the isolates of MRSA ranged from 0.125 μg/ml to 1 μg/ml.
The results of the vancomycin MICs of MRSA isolates are shown in Table 1.

Table 1: Vancomycin MICs of *MRSA* isolates

MIC range (μg/ml)	MRSA No. of isolates (%)
≤0.25	0(0)
≤0.38	1(3.4)
≤0.75	2(6.9)
≤0.5	0(0)
≤1	16(55.1)
≤1.5	9(31.0)
≤2	1(3.4)

The variation in statistical categories of vancomycin MIC for MRSA isolates are shown in Table 2.

Table 2: Variation in statistical categories of vancomycin MIC for MRSA isolates in this study

Isolates	MIC ≤ 1 μg/ml	1 < MIC ≤2 μg/ml	Total
MRSA	19	10	29

Conclusion: From our findings we conclude that the rate of isolation of MRSA was high and it has emerged as a serious public health threat to Sri Lanka. The Minimum Inhibitory Concentration (MIC) of all the MRSA isolates were ≤2 μg/ml. None of the MRSA isolates were found to be intermediate-sensitive or vancomycin-resistant. Therefore, vancomycin can still be used as the drug of choice for treatment of infections caused by MRSA.

O1-GP04

Synergistic combination of antibiotics targeting identical subcellular structure with different mechanism to prevent antimicrobial resistance

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Antibiotic resistance can be significantly slowed while be not stopped. Although the general benefits of combination for treating bacterial infections have been difficult to conclusively demonstrate, combination therapy was still an effective strategy to prevent resistance. The key to prevent resistance during combination therapy was probably the validity of synergistic combination. To prove this, the fractional inhibitory concentration indexes (FICIs) of three combinations against methicillin-resistant *Staphylococcus aureus* (MRSA) were determined using checkerboard method. Further, the minimal concentrations inhibiting colony formation by 99% (MIC_{99}s) and the mutant prevention concentrations (MPCs) of antmicrobial agents alone or in combinations including different proportions were tested using agar plates. Their FICIs (Table 1) indicated the combination of roxithromycin and doxycycline respectively targeting ribosomal protein 50*S* and 30*S* showed remarkably synergistic activity against MRSA 01 and 02, but against MRSA 03 which was resistant to roxithromycin. Other combinations showed no synergistic activity, which was likely due to antibiotics in combinatins targeting different subcellular structure or being resistant to test MRSA. The MIC_{99}s and MPCs alone or in combinations (Table 1) showed the mutant selection window (MSW) of roxithromycin or doxycycline in combinations against MRSA 01 and 02 could be closed each other, but for others. These indicated that remarkably synergistic combinations of antibiotics being susceptible to pathogenic bacteria could prevent resistance according to the hypotheses of MPC and MSW, and antibiotics targeting identical subcellular structure with different mechanism had a great potency to obtain remarkably synergistic combinations.
Acknowledgements: This work was supported by grants from the National Natural Science Foundation of China (No. 81460529, 81660578 and 81260476).

O1-GP05

The role of Toll-like receptors in pathogenesis of pneumococci of various serotypes

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Background: Pneumococcal cell wall is a major inflammatory component. Pneumococcal cell wall comprises of peptidoglycan and covalently attached to cell wall teichoic acid, cell surface proteins and capsular polysaccharides. Toll-like receptors are pattern recognition receptors on the host that identifies molecular components on pathogens via pathogen-specific molecular patterns and cause activation of host immune responses. The aim of the study is to investigate the effect of pneumococcal cell wall of various serotypes on Toll-like receptor signaling responses, using A549 human lung epithelial cell as an *in vitro* model.
Methods: We challenged A549 human lung epithelial cell line with pneumococcal cell wall extract of different serotypes (1, 3, 5, 19F, 23F, 14) and the RNA from the host cells was extracted. The expression of 84 genes associated to Toll like receptor signaling