APFID
ASIA PACIFIC FOUNDATION FOR INFECTIOUS DISEASES

ANSORP
ASIAN NETWORK FOR SURVEILLANCE OF RESISTANT PATHOGENS

Monthly Newsletter
November 2013

ANSORP *NOW*

CONTENTS :

Dear ANSORP Investigators

Greetings from Seoul !
I hope all ANSORP investigators are doing well.

This is the 2013 November issue of ANSORP NOW. It provides update information and current status of ANSORP activities. "ANSORP NOW" is a monthly newsletter, delivered to all ANSORP investigators by e-mail and website of APFID (www.apfid.org).

Please read this ANSORP NOW carefully to update our international collaboration. If you have any ideas, opinions, or issues that can be shared with other ANSORP investigators, please send us e-mails or FAX.

I always appreciate your active participation in the ANSORP activities.

Jae-Hoon Song, MD, PhD
Organizer, ANSORP
Founder & Chairman, APFID

APEC Expert Forum on international campaign program to control AMR in Asia

APFID has been collaborating with the APEC to set up the future strategies to control and prevent antimicrobial resistance (AMR) in the Asia-Pacific region since 2010. The first APEC project in 2010-2011 entitled "International initiatives to control AMR in the Asia-Pacific region" was successfully performed by developing the first international strategic action plans to control and prevent AMR in the Asian region. Among the strategic action plans to control AMR from this project, the most basic and essential strategy is to increase the awareness of AMR and promote appropriate use of antibiotics through educational and campaign activities. Therefore, the second APEC project in 2012-2013 was the "International campaign program to control antimicrobial resistance in the Asia-Pacific".

For the second APEC project, APEC Expert Forum on international campaign program to control AMR was held in Seoul, Korea on Nov. 9, 2013. Based on the valuable opinions and recommendations received during the forum, we will develop strategies of Campaign 4 and launch the campaign from the end of this year in collaboration with APEC and WHO Western Pacific region. We hope that we can contribute to the control and prevention of AMR in the region through this campaign.

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Publications of ANSORP and APFID in November 2013

Spread of carbapenem-resistant *Acinetobacter baumannii* global clone 2 in Asia and AbaR-type resistance islands

Antimicrob Agents Chemother. 2013 Nov;57(11):5239-46

Kim DH, Choi JY, Kim HW, Kim SH, Chung DR, Peck KR, Thamlikitkul V, So TM, Yasin RM, Hsueh PR, Carlos CC, Hsu LY, Buntaran L, Lalitha MK, Song JH, Ko KS

ABSTRACT

In this surveillance study, we identified the genotypes, carbapenem resistance determinants, and structural variations of AbaR-type resistance islands among carbapenem-resistant *Acinetobacter baumannii* (CRAB) isolates from nine Asian locales. Clonal complex 92 (CC92), corresponding to global clone 2 (GC2), was the most prevalent in most Asian locales (83/108 isolates; 76.9%). CC108, or GC1, was a predominant clone in India. OXA-23 oxacillinase was detected in CRAB isolates from most Asian locales except Taiwan. blaOXA-24 was found in CRAB isolates from Taiwan. AbaR4-type resistance islands, which were divided into six subtypes, were identified in most CRAB isolates investigated. Five isolates from India, Malaysia, Singapore, and Hong Kong contained AbaR3-type resistance islands. Of these, three isolates harbored both AbaR3- and AbaR4-type resistance islands simultaneously. In this study, GC2 was revealed as a prevalent clone in most Asian locales, with the AbaR4-type resistance island predominant, with diverse variants. The significance of this study lies in identifying the spread of global clones of carbapenem-resistant *A. baumannii* in Asia.

Dissemination of metallo-β-lactamase-producing *P. aeruginosa* of sequence type 235 in Asian countries

J Antimicrob Chemother. 2013 Dec;68(12):2820-4

Kim MJ, Bae IK, Jeong SH, Kim SH, Song JH, Choi JY, Yoon SS, Thamlikitkul V, Hsueh PR, Yasin RM, Lalitha MK, Lee K

ABSTRACT

OBJECTIVES: To investigate the epidemiological traits of metallo-β-lactamase (MBL)-producing *Pseudomonas aeruginosa* (MPPA) clinical isolates collected by the Asian Network for Surveillance of Resistant Pathogens (ANSORP). **METHODS:** A total of 16 MPPA clinical isolates were collected from six Asian countries in 2000 to 2009 by ANSORP. The MBL gene was detected by PCR amplification. The genetic organization of the class 1 integron carrying the MBL gene cassette was investigated by PCR mapping and sequencing. Southern blotting, repetitive sequence-based PCR and multilocus sequence typing (MLST) experiments were performed to characterize the isolates. **RESULTS:** PCR and sequencing experiments detected the blaVIM-2 (n=12), blaVIM-3 (n=1), blaIMP-6 (n=2) and blaIMP-26 (n=1) genes. The MBL genes were located on the chromosome in all isolates except one. Furthermore, all the MBL genes were located in a class 1 integron. All the MPPA isolates from Malaysia, Thailand, Sri Lanka and Korea were identified as sequence type (ST) 235 by MLST. Three VIM-2-producing isolates from India were identified as ST773, and one isolate harbouring VIM-3 from Taiwan was identified as ST298. **CONCLUSIONS:** *P. aeruginosa* ST235 might play a role in dissemination of MBL genes in Asian countries.

Epidemiology and clinical outcomes of bloodstream infections caused by ESBL-producing *Escherichia coli* in patients with cancer

Int J Antimicrob Agents. 2013 Nov;42(5):403-9

Ha YE, Kang CI, Cha MK, Park SY, Wi YM, Chung DR, Peck KR, Lee NY, Song JH

ABSTRACT

Patients with cancer can be vulnerable to infection with antimicrobial-resistant pathogens such as ESBL-producing Enterobacteriaceae. A cohort study was performed to evaluate the epidemiology and impact of ESBL-producing *Escherichia coli* (ESBL-EC) bacteraemia on the outcomes of adult patients with cancer. During the 2.5-year study period, a total of 350 cases of *E. coli* bacteraemia were documented in cancer patients, of which 95 (27.1%) were due to ESBL-EC. Significant factors associated with ESBL-EC bacteraemia were liver disease, immunosuppressant use, recent surgery, and prior use of cephalosporins or fluoro-quinolones. The overall 30-day mortality rate was 14.9% (52/350), and the mortality rate was higher in patients with ESBL-EC than in those without ESBL-EC (22.1% vs.12.2%; P=0.02). Multivariate analysis showed that ESBL-EC was an independent risk factor for mortality (odds ratio=3.01, 95% confidence interval 1.45-6.28; P=0.003), along with the presence of septic shock, mechanical ventilation, the severity of underlying diseases, and pneumonia as a source of bacteraemia. Of the 69 isolates in which ESBLs and their molecular relationships were studied, 68 (98.6%) produced CTX-M-type and 51 (73.9%) produced CTX-M-14 and/or CTX-M-15. Twenty-four sequence types (STs) were identified among CTX-M-14- and CTX-M-15-producing *E. coli* isolates, with ST131 being the most prevalent (12/51; 23.5%). In conclusion, this study confirms that CTX-M-producing *E. coli* and ST131, which have been shown to be an emerging public health threat, are widely prevalent in cancer patients and can adversely affect the outcome of *E. coli* bacteraemia in these patients.

Advances in pneumococcal antibiotic resistance.

Expert Rev Respir Med. 2013 Oct;7(5):491-8 / Song JH.

ABSTRACT

Antimicrobial resistance and serotypes in *S. pneumoniae* have been evolving with the widespread use of antibiotics and the introduction of pneumococcal conjugate vaccines (PCV). Particularly, among various types of antimicrobial resistance, macrolide resistance has most remarkably increased in many parts of the world, which has been reported to be >70% among clinical isolates from Asian countries. Penicillin resistance has dramatically decreased among nonmeningeal isolates due to the changes in resistance breakpoints, although resistance to other β-lactams such as cefuroxime has increased. Multidrug resistance became a serious concern in the treatment of invasive pneumococcal diseases, especially in Asian countries. After PCV7 vaccination, serotype 19A has emerged as an important cause of invasive pneumococcal diseases which was also associated with increasing prevalence of multidrug resistance in pneumococci. Widespread use of PCV13, which covers additional serotypes 3, 6A and 19A, may contribute to reduce the clonal spread of drug-resistant 19A pneumococci.

Interesting papers

Antibiotic resistance-the need for global solutions

Lancet Infect Dis. 2013 Nov 15.
doi:pii:S1473-3099(13)70318-9.

Laxminarayan R, Duse A, Wattal C, Zaidi AK, Wertheim HF, Sumpradit N, Vlieghe E, Hara GL, Gould IM, Goossens H, Greko C, So AD, Bigdeli M, Tomson G, Woodhouse W, Ombaka E, Peralta AQ, Qamar FN, Mir F, Kariuki S, Bhutta ZA, Coates A, Bergstrom R, Wright GD, Brown ED, Cars O.

ABSTRACT

The causes of antibiotic resistance are complex and include human behaviour at many levels of society; the consequences affect everybody in the world. Similarities with climate change are evident. Many efforts have been made to describe the many different facets of antibiotic resistance and the interventions needed to meet the challenge. However, coordinated action is largely absent, especially at the political level, both nationally and internationally. Antibiotics paved the way for unprecedented medical and societal developments, and are today indispensible in all health systems. Achievements in modern medicine, such as major surgery, organ transplantation, treatment of preterm babies, and cancer chemotherapy, which we today take for granted, would not be possible without access to effective treatment for bacterial infections. Within just a few years, we might be faced with dire setbacks, medically, socially, and economically, unless real and unprecedented global coordinated actions are immediately taken. Here, we describe the global situation of antibiotic resistance, its major causes and consequences, and identify key areas in which action is urgently needed.

Implementing a strategy for monitoring inpatient antimicrobial use among hospitals in the United States

Clin Infect Dis. 2013 Nov 11. [Epub ahead of print]

Fridkin SK, Srinivasan A

ABSTRACT

Measuring antimicrobial use is an important way to provide metrics that support more vigorous, facility-specific stewardship efforts, which in turn will be a major step toward reducing unnecessary use of broad-spectrum antimicrobials. Yet no single system is available in the United States that can meet stewardship needs at the level of individual hospitals and provide benchmarks, monitor trends, and measure the magnitude of antimicrobial use at the regional, state, and national levels. Therefore, the Centers for Disease Control and Prevention is pursuing 3 distinct and complimentary efforts that remain focused on providing "data for action," including facility-level use metrics for benchmarking across comparable patient care settings, national estimates of usage patterns using sentinel surveillance sites, and limited assessments using proprietary data.

Declining cephalosporin and fluoroquinolone non-susceptibility among bloodstream Enterobacteriaceae from the UK: links to prescribing change?

J Antimicrob Chemother. 2013 Nov;68(11):2667-74

Livermore DM, Hope R, Reynolds R, Blackburn R, Johnson AP, Woodford N.

ABSTRACT

OBJECTIVES: The UK saw major increases in cephalosporin and quinolone resistance amongst Enterobacteriaceae from 2001 to 2006, with cephalosporin resistance largely reflecting dissemination of CTX-M extended-spectrum β-lactamases (ESBLs). We review subsequent trends.

METHODS: Data were extracted from Public Health England's national database (LabBase), which collects susceptibility results for bloodstream isolates from hospital microbiology laboratories in England, Wales and Northern Ireland, and from the BSAC Bacteraemia Resistance Surveillance System, which centrally tests bloodstream isolates from 25-40 sentinel UK and Irish laboratories. Reference laboratory submissions were also reviewed.

RESULTS: LabBase and BSAC data showed that rates of non-susceptibility to cephalosporins and quinolones rose amongst *Escherichia coli* and *Klebsiella* spp. until mid-decade (2004-07) before plateauing or falling; similar falls in non-susceptibility began slightly earlier in *Enterobacter* spp. These reversals in trend occurred whilst the incidence of *E. coli* bacteraemias was rising, the incidence of Klebsiella bacteraemias was stable and the incidence of Enterobacter bacteraemias was falling; they were not paralleled in EARS-Net data for continental Europe and did not reflect the displacement of single mechanisms. They coincided with large reductions in hospital cephalosporin and quinolone use, owing to concern about *Clostridium difficile*, with replacement by penicillin/β-lactamase inhibitor combinations, which have borderline activity against ESBL producers, but consistently lack activity against carbapenemase producers.

CONCLUSIONS: Non-susceptibility to cephalosporins and quinolones has declined among bloodstream Enterobacteriaceae in the UK, probably reflecting prescribing shifts. The penicillin/β-lactamase inhibitor combinations that have largely replaced cephalosporins and quinolones may add to selection for carbapenemase producers.

If you need PDF version of the papers, please contact ANSORP Project Manager (Dr. So Hyun Kim, shkim@ansorp.org).

We always appreciate your active contribution to ANSORP activities.
If you have any questions, or issues that can be shared with other ANSORP investigators, please let us know them at any time.