

I-1

### Preliminary Report of a Prospective Study of Bacteremia in a Teaching Hospital

C-Y WANG\*, Kumarasinghe, G\*\* and T-Y Ti\*

\*Faculty of Medicine, National University of Singapore,  
\*\*Microbiology Laboratory, National University Hospital

**BACKGROUND** Bacteremia is an important cause of morbidity and mortality in hospitalized patients. The aim of this project is to study prospectively the demographic characteristic of septicemic patients, types of pathogens, usage of antibiotics and outcome of treatment. The following is a preliminary report of the study.

**METHODS** The microbiology laboratory of the hospital was visited daily to collect the names of patients with positive blood cultures. Data was collected from patient's medical charts and the patients were followed prospectively until the outcome of the septicemic episodes has been defined. The following data were collected and a period of 2 months.

**RESULTS** A total of 138 positive blood cultures were evaluated in 2 months; 93 patients had true bacteremia (95 positive cultures). 69% (66 episodes) of the infection was community-acquired, and 31% (29 episodes) was nosocomial. The most common pathogen was *E. coli*, for community-acquired infection and methicillin resistant *Staph. aureus* (MRSA) for nosocomial infection. 12 patients (13%) had polymicrobial bacteremia. When culture results were available the initial antimicrobial therapy was changed in 29% (27 patients) of the patients. Septicemia caused or contributed to the death of 10.5% (10 patients) of the patients.

**COMMENTS** The common pathogens for nosocomial infections were MRSA, *E. coli* and *Klebsiella*. No definitive conclusion can be drawn from this preliminary report, as the numbers are small.

I-2

### Change of Bacterial Isolates Detected from Blood Culture of Pediatric Patients in 17 Years and Analyses of Antimicrobial Resistance

Guo YF, Zhen JH, Zhang MH, et al.

Institution Beijing Childrn's Hospital Affiliated to Capital University of Medical Sciences

**OBJECTIVE** To investigate the changes of bacteria detected from blood of pediatric patients in the past 17 years and the relations between the isolated bacterial species and age of the patients and season, and to observe the antimicrobial resistance of these bacteria.

**METHODS** Total 6,569 bacterial isolates were obtained from blood culture in our hospital between 1983 and 1999. Blucose broth and API system were applied and microscan for differentiation and antimicrobial resistance determination. Results were interpreted according to NCCLS recommendations.

**RESULTS** Coagulase negative Staphylococci (CNS) accounted for more than 50% every year. *Enterococcus* increased from 4.8% in early 1990's to 15.9% in 1999 (*Enterococcus faecium* accounted for 68.8%). *Klebsiella* increased from 0.4% of 1983 to 3.15% of 1999. *Enterobacteriaceae* increased from 0.1% to 1.4%. *E. coli* and *S. aureus* decreased from 8.1% and 6.3% in 1983 to 2.1% and 1.6% in recent years, respectively. *Salmonella* decreased from 2.7% to 0/2%. MRSA and MRCNS accounted for 16% and 64.1%, respectively. The antimicrobial resistance of *Enterobacteriaceae* to imipenem, ceftazidime and amikacin was all below 50%. *E. coli* and *Klebsiella* that produce the ESBL were accounted for 64.2% and 88%, respectively.

**CONCLUSIONS** 1) Low virulence conditional bacteria became more common in pediatric patients. 2) Gram-positive bacteria, CNS *Enterococcus faecium* and complex bacteria were more frequently detected among young children than other groups. 3) Detection rate of some bacteria and the level antimicrobial resistance in children were higher than those in adults. Medication should be followed the results of surveillance of antimicrobial res...

I-3

### The Study of Microbiology and Antibiotic Susceptibility of Bacterial Strains Isolated from Patients with Impetigo.

Ma L, Zhao PY, Yang YH, et al.  
Beijing Children's Hospital (BCH)

**OBJECTIVE** To investigate the bacteriological features and the epidemiology of MRSA in the patients with impetigo, and provide evidence for selection of appropriate agents for treating impetigo and its complications.

**METHODS** Two hundred and forty six outpatients with impetigo were surveyed. Cultures were obtained from impetiginous lesions. Antibiotic susceptibility tests on 212 *S. aureus* isolates were performed by standard agar dilution testing (MIC).

**RESULTS** In total of 246 isolates, 87.0% yielded *S. aureus* alone, 2.0% *S. aureus* and group A beta-hemolytic streptococcus (GABHS), 1.6% GABHS alone, 45.1% *S. epidermidis*. Fifteen antimicrobial agents were used in the susceptibility tests. One hundred percent of *S. aureus* isolates were resistant to penicillin, 87.7% were resistant to erythromycin, followed by clindamycin (75.5%), tetracycline (63.2%), chloramphenicol (54.2%), ampicillin/sulbactam (44.8%), oxacillin (30.2%), ciprofloxacin (12.8%), cefotaxime (0.9%), fusidic acid (0.9%) and gentamicin (0.9%). None of the *S. aureus* isolates was resistant to vancomycin, cefazolin, cefuroxime and mupirocin. Sixty four MRSA strains were isolated. No vancomycin resistant *S. aureus* strain was found.

**CONCLUSIONS** Penicillin, erythromycin, clindamycin, tetracycline, chloramphenicol and ampicillin/sulbactam prove to be no longer the appropriate therapeutic agents. Cephalosporin, mupirocin and fusidic acid might be the good choice for the treatment of impetigo in our region.

I-4

### Antibiotic Resistance at St. Elizabeth Cancer Institute within last 20 months.

Robert Babela  
St. Elizabeth Cancer Institute

**OBJECTIVES** The main objectives of the study are to monitor resistance according to standardized methods, identify new/emerging resistance mechanisms at an early stage, prevent their dissemination, early detection and prevention of the outbreaks.

**METHODS** We used antibiotic disc sensitivity testing methodology, which complies with the NCCLS 1993 and utilized adequate controls. Zone sizes were measured objectively using a BIOMIC automated radius zone reader. We used disc method because it is preferred for long term surveillance as it allows both measurement of MICs (regression line analysis) and detection of more subtle changes in MIC levels.

**RESULTS** Throughout last 20 months (January 1999 to August 2000) we have tested 2609 organisms collected from Medical Dept. (633, 24.2%), Surgical-Oncology Non ICU Dept. (139, 5.3%), ICU Dept. (137, 5.2%), Radio-Oncology Dept. (816, 31.2%), OBG Dept. (190, 7.2%) and from Outpatient Dept. (940, 36%). From 179 (100%) tested strains of *Pseudomonas aeruginosa* 72 (40.2%) were gentamicin resistant and 9 (5%) were ceftazidime resistant. From 240 (100%) strains of beta-hemolytic streptococci the highest resistance was to erythromycin (15, 6.2%). We collected 306 (100%) strains of *Enterococci* whereabouts 17 (5.5%) were beta lactamase positive and 9 (2.9%) were high level gentamicin resistant. From 1267 (100%) strains of *Enterobacteriaceae* 59 (4.6%) were ciprofloxacin resistant, 52 (4.1%) were gentamicin/aminoglycosides resistant, 30 (2.4%) were extended spectrum beta-lactamase positive.

**CONCLUSION** Thanks to good local antibiotic policies we can go on in fighting high resistance of *Pseudomonas aeruginosa* to aminoglycosides, metronidazole resistance in anaerobes and aminoglycosides resistance in *Acinetobacter* spp.

## I-5

### Multicenter Surveillance of Antimicrobial Resistance of Major Bacterial Pathogens in Intensive Care Units in Taiwan 2000 (SMART-2000-ICUs)

P-R HSUEH, Y-C LIU, W-C KO, T-L WU, T-I YANG, J-J YAN, J-J WU, H-S LEU, K-T LUH

National Taiwan University Hospital, Makay Memorial Hospital, Taipei; Veterans General Hospital, Kaohsiung; Chang Gung Memorial Hospital, Lin-Kou; and National Cheng-Kung University Hospital, Tainan, Taiwan

A total of 1274 isolates collected from five major teaching hospitals in different parts of Taiwan from March to June 2000 were determined their in vitro susceptibilities against more than 15 antimicrobial agents (SMART-2000-ICUs) (Surveillance from Multicenter Antimicrobial Resistance in Taiwan). Susceptibility testing were performed and interpreted according to the guidelines of National Committee for Laboratory Standards (NCCLS-2000). The results were compared with those of multicenter surveillance for susceptibilities of major clinical bacterial pathogens in Taiwan, 1999 (Taiwan-1999), and NNIS-1998. The results are as follows:

Resistant bacteria	SMART-2000-ICUs (%)	NNIS-1998 (%)	Taiwan-1999 (%)
MRSA	66	46.7	41-65
PRSP	58	-	66-83
Penicillin-R enterococci	18	-	44-85
Vancomycin-resistant enterococci	0	23.9	1-10
Cefotaxime-R ( <i>E. coli</i> )	21	3.2	5-18
Cefotaxime-R ( <i>K. pneumoniae</i> )	14	10.7	4-23
Cefotaxime-R ( <i>E. cloacae</i> )	57	34.0	43-58
Ceftazidime-R ( <i>P. aeruginosa</i> )	22	-	2-14
Imipenem-R ( <i>P. aeruginosa</i> )	15	17.1	4-13
Imipenem-R ( <i>A. baumannii</i> )	22	-	0-10

## I-6

### Bacterial Infections in Hospitalized Patients in Thailand 1997 & 2000

V. THAMLIKITKUL, D. JINTANOTHAITAVORN, S. VAITHAYAPICHES, R. SATHITMATHAKUL, S. TRAKULSOMBOON, S. DANCHAIWIJITR

Faculty of Medicine Siriraj Hospital, Bangkok, Thailand

**OBJECTIVE** To determine the patterns of bacterial infections and trends in resistance to antibiotics of bacteria causing infections in patients admitted to the hospitals in Thailand in 1997 and 2000.

**STUDY SITES** 37 hospitals located in all regions of Thailand.

**RESULTS** 8,164 and 6,725 episodes of documented culture proven bacterial infections were collected in 1997 and 2000 respectively. 47% and 50% of the infections in 1997 and 2000 were hospital-acquired infections ( $p < 0.0001$ ). Urinary tract and lower respiratory tract were the most common site of infections in 1997 and 2000 respectively. 80% of infections in 1997 and 2000 were caused by gram negative bacteria in which *E. coli* was the most prevalent organism in both periods followed by *Klebsiella spp.*, *P. aeruginosa* and *Acinetobacter spp.*. An increase antibiotic resistance in gram negative bacteria was observed in the data collected in 2000 when compared with those in 1997. The prevalence of gram positive bacteria in hospital acquired infections of 23% in 2000 was significantly more than that of 15% in 1997 ( $p=0.0001$ ). Antibiotic resistance among gram positive bacteria was not obviously different between 1997 and 2000.

**CONCLUSION** Gram negative bacteria causing infections in 2000 are more resistant to antibiotics when compared with those in 1997. The prevalence of gram positive bacteria causing hospital acquired infections has significantly increased. The trend of more resistance in gram positive bacteria is not clearly observed between 1997 and 2000.

## I-7

### Resistance Data from A 1200 Bed Hospital in Singapore

T Barkham

Department of Pathology and Laboratory Medicine, Tan Tock Seng Hospital, Singapore

Resistance data from a 1200 bed hospital in Singapore.

Disc diffusion and ESBL detection methods follow NCCLS guidelines. Resistance rates are presented for community acquired (CAI) and hospital acquired (HAI) infections respectively.

Blood Isolates. *S.aureus*: 20% and 62% are MRSA. *Klebsiella sp.* coamoxycyclav 3 and 45%, ceftriaxone 17 and 64%, gentamicin 15 and 24%, amikacin 5 and 9%, ciprofloxacin 17 and 54%. *E.coli.* coamoxycyclav 5 and 7%, ceftriaxone 8 and 27%, gentamicin 12 and 27%, amikacin 0 and 0%, ciprofloxacin 18 and 46%. Urine.

Rates for *Klebsiella sp.* from HAI: coamoxycyclav 40%, ceftriaxone 66%, gentamicin 66%, Amikacin 27%, ciprofloxacin 60%, co-trimoxazole 80%, nitrofurantoin 80%.

ESBL rates range from 4.5% for CAI isolates of *E.coli* to 60% for HAI *Klebsiella sp.* VRE has not been detected. 37% of CAI strains of *S.pneumoniae* are either resistant (25%) or intermediate (12%) by Estrip MIC.

**COMMENT** Most organisms causing CAI remain relatively susceptible compared to their counterparts causing HAI. The definition of CAI is misleading as it does not take into account previous exposure to antibiotics and may be biased by large numbers of outpatient samples. If CAI and HAI related resistance data are used by clinicians to guide empirical therapy patients may be over treated with consequent effects on resistance rates.

## I-8

### Antibiotic Resistance of Some Potentially Pathogenic Bacteria in Community

Pham Van Ca\*, Le Dang Ha\* et al.

\* National Program for Surveillance in Antimicrobial Resistance

In March, 1999; 153 *Streptococcus pneumoniae*, 150 *Haemophilus influenzae*, 151 *Staphylococcus aureus*, and 150 *Escherichia coli* strains isolated from healthy children at communities of three cities (Ha Noi, Hue, and Hochiminh city) were investigated and the received results showed that:

- The recovery percentage of these bacteria are:
  - S. pneumoniae*: 40.1% in Hanoi, 16.7% in Hue and 30.9% in HCMC
  - H. influenzae*: 40.1% in Hanoi, 21.7% in Hue, and 30.9% in HCMC
  - S. pneumoniae* and *H. influenzae* are 15.3%, 1.9%, and 10.5% in the 3 cities
  - E. coli*: 40.1% in Hanoi, 100% in Hue, and 41.7% in HCMC
  - S. aureus*: 16.8% in Hanoi, 27.3% in Hue and 43.1% in HCMC.
- Among 153 strains of *S. pneumoniae*, 94 have capsule (61.4%). And 52.7% of *H. influenzae* strains are type b.
- MRSA are recovered from 4% to 15.7% depending on different areas
- S. pneumoniae* strains are highly resistant to the common used antibiotics: 22 - 86% to cotrimoxazol, 22 - 66% to erythromycin, and 14 - 34% to chloramphenicol. To cephalothin, cefuroxim, cefaclor, the collected strains are still susceptible. To penicillin G, 19.6% of the isolates are decreased the susceptibility.
- H. influenzae* are also resistant to cotrimoxazol (26.5 to 100%), ampicillin (24.5% to 79.6%), chloramphenicol (30.6% to 42%), cefuroxime and cefaclor (0% to 69.4%), amikacin (0% to 30.6%). The isolates are still susceptible to gentamicin (85.7% and norfloxacin (98%).
- Among *E. coli* isolates, 41.3% are resistant to ampicillin, 40.7% to cotrimoxazol, and 23.3% to chloramphenicol. To cephalothin, cefuroxime, ceftriaxone, gentamicin, amikacin, and norfloxacin, all the isolates are still susceptible.
- S. aureus* are highly resistant to penicillin G 45.1% to 100%, and erythromycin (41.2% to 80%), Luckily, the isolates are low resistant to cephalothin, cefuroxime, gentamicin, amikacin, cotrimoxazol; and none are resistant to vancomycin.

I-9

### Alarming Increase in Antibiotic Resistance in Hong Kong

**J.M. LING**

Enteric Pathogens Group, Antimicrobial Unit, Department of Microbiology, The Chinese University of Hong Kong, Prince of Wales Hospital, Hong Kong SAR, China.

**OBJECTIVE** To monitor the level of antibiotic resistance in Hong Kong.

**METHODS** Susceptibilities of bacterial pathogens to different antimicrobials were determined by a disk diffusion test as recommended by the National Committee for Clinical Laboratory Standards. The isolates were from patient specimens collected during 1994-1999 in the Prince of Wales Hospital, a 1,400-bed general hospital in Hong Kong.

**RESULTS** The most common bacterial pathogens isolated were *Escherichia coli* ( $\approx 18,600$ ) and *S. aureus* ( $\approx 16,600$ ). Others included *Ps aeruginosa* ( $\approx 7,800$ ), *H. influenzae* ( $\approx 4,700$ ), *Salmonella* sp ( $\approx 2,200$ ) and *S. pneumoniae* (11,680). Resistance to ciprofloxacin of *E coli* increased from 5% in 1994 to more than 30% in 1999, resistance to cefuroxime increased from 8% to 17%, and resistance to ceftazidime increased from 2% to 17%. Thirty-six percent of *H. influenzae* were resistant to ampicillin (31% previously), 14-25% to chloramphenicol (7-20% previously) and 9-19% to cotrimoxazole (11% previously). More than 20% of salmonellae were resistant to ampicillin (an increase from 16%) and 7% to cefuroxime (an increase from 3%). All isolates of *S pneumoniae* were sensitive to penicillin in 1990, however, 10% and almost 60% were resistant in 1993 and 1999, respectively. Resistance to cloxacillin and fucidic acid of *S. aureus* isolates remained at about 30% and 3%. Resistance to netilmicin, ciprofloxacin, ceftazidime and imipenem also remained unchanged among *P. aeruginosa* isolates, being 3-5%.

**CONCLUSIONS** Resistance to antibiotics had increased at an alarming rate in most of the common bacterial pathogens isolated except *S. aureus* and *P. aeruginosa*

I-10

### Susceptibility Patterns of Gram Positive Bacteria Against "New" and "Old" Antibiotics

**C Chow and G Kumarasinghe**

Department of Laboratory Medicine, National University Hospital, Singapore 119074

The increasing antibiotic resistance of Gram positive organisms in the last decade has become a problem for clinical treatment. Multiple resistant *Streptococcus pneumoniae*, HLAR enterococci, glycopeptide intermediate staphylococci and VRE have been reported world wide. This may signal the eventual appearance of vancomycin resistance *Staphylococcus aureus*.

The objective of the study was to evaluate routinely used antibiotics erythromycin, clindamycin, ampicillin, vancomycin, chloramphenicol and doxycycline in parallel with four hitherto unused drugs in the hospital - teicoplanin, linezolid, quinupristin and trovafloxacin.

160 Gram positive bacteria isolated from blood, respiratory tract, surgical and non surgical wounds were tested. The organisms included were as follows: *Enterococcus faecalis* (n=30), *Enterococcus faecium* (n=10), MRSA (n=20), coagulase negative staphylococci (n=35), *Staphylococcus aureus* (n=30), *Streptococcus pneumoniae* (n=30) and *Streptococcus* spp (n=5). Kirby-Bauer Method was used for susceptibility testing except in the case of *Strept pneumoniae* and *Streptococcus* spp., where the organisms were tested by "E" test MIC technique. Trovafloxacin was evaluated only against *Streptococcus pneumoniae* and *Streptococcus* spp.

There were strains of *Staphylococcus* spp. resistant to all the drugs tested except for vancomycin. 23% of *Enterococcus faecalis* and 3% of coagulase negative staphylococci were resistant to linezolid. The incidence of resistance to quinupristin was higher compared to linezolid. *Streptococcus pneumoniae* and *Streptococcus* spp. were uniformly susceptible to trovafloxacin.

Antibiotic resistance among Gram positive organisms...

I-11

### Antibiotic Susceptibilities of Urinary Pathogens over Seven and Fourteen Years

**M. RAHMAN**

Microbiology Department, King's Mill Hospital, Mansfield, Notts. U.K.

**OBJECTIVES** As part of ongoing surveillance on antibiotic resistance, this study was undertaken to see changes in antibiotic susceptibilities between 1993 and 1999 and trends from 1985.

**METHODS** This was done by collecting data on antibiotic susceptibilities of urinary pathogens from microbiology laboratory of the district general hospital of relevant years and analysing all figures at the end.

**RESULTS** In terms of percentage sensitivities, co-amoxycylav covered highest proportion of pathogens (90% - 94%), followed by cephalixin, nalidixic acid and nitrofurantoin (84% - 90%). 90% - 94% of multiresistant organisms e.g. *Pseudomonas*, *Acinetobacter* and *Enterobacter* species, were sensitive to ciprofloxacin.

**CONCLUSION** No significant changes were observed in seven years; however gradual changes were noticed over fourteen years.

I-12

### The Patterns of Infection and Therapy in Cancer Patients Receiving Chemotherapy

**J-S Kim\*, J-M Oh**

Sokmyung Women's University, Graduate School of Chincial Pharmacy, Seoul Korea

Chemotherapy-induced neutropenia makes cancer patients susceptible to infections, which are the leading cause of death. The purpose of this study was to evaluate the patterns of infection, causative pathogens and pattern of antimicrobial therapy in cancer patients receiving chemotherapy in a D. teaching university of Korea. The medical records of patients who have been hospitalized with infections between September 1999 and August 2000 while receiving chemotherapy were retrospectively reviewed. 56 patients (96 episode of infections) were hospitalized with infections (48 patients with solid tumor and 8 with hematologic cancer). Lower respiratory infection was the most common infection (48%) in solid cancer patients while unexplained fever (28%), followed by lower respiratory infection (17%) and UTI (17%) were the most common infections in hematological cancer patients. 63% of the overall infection was caused by gram-negative organisms and 23% by gram-positive organisms and 14.5% by *candida* sp. In neutropenic patient, the incidence of gram-positive organisms was 31% while gram-negative organisms was 56%. *Pseudomonas aeruginosa* and *Klebsiella pneumoniae* and *Enterobacter* spp, *Acinetobacter* spp, *Citrobacter* spp were commonly isolated organism of gram-negative pathogens. *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Enterococci* and CNS were isolated organism of gram-positive pathogens. Both the median duration of G-CSF use and neutropenia were 3 days. The dual antimicrobial therapy with aminoglycoside and ESP/ $\beta$ -lactamase inhibitor was the most commonly used as an empiric antimicrobial therapy in febrile neutropenic patients since the most common causative pathogens of infection were gram-negative bacilli such as *Enterobacteriaceae*, *Pseudomonas aeruginosa* and *Acinetobacter* spp. There was no difference in the types of pathogens between neutropenic and non-neutropenic patients.

**I-13****National Antimicrobial Resistance Surveillance, Thailand (NARST)**

**P. Pothisiri, M. Kusum, P. Sawanpanyalert, S. dejsirilert\* and the Working Group**  
 Department of Medical Sciences, Ministry of Public Health, Nonthaburi, Thailand.

**OBJECTIVE** The NARST has been established since 1998 to follow resistance trends and use the result to update treatment guideline and lists of essential drug.

**METHOD** In 1998-1999, 22 hospitals participated and were expanded to 33 in the year 2000. Results of routine antimicrobial susceptibility test, according to the NCCLS standard, were recorded by using the WHONET software and submitted to the coordinating center for analysis. To obtain the reliable results, the laboratory quality system is applied. The quality assurance activities include organizing yearly training course, strengthening the internal quality control, and proficiency testing. The center also conducts as National Reference Laboratory on species identification and confirmation of unusual susceptibility result of isolates sent from the members.

**RESULT** In the year 1998, 1999 and 2000, a total of 89,425, 113,843 and 79,386 isolates were tested by all members. *E. coli*, *P. aeruginosa*, *K. pneumoniae*, and *Acinetobacter* spp. were the 5 most common isolates accounted for 60% for all isolates. Resistance among *P. aeruginosa* and *Acinetobacter* were resistant to most agents even to the effective imipenem with the nonsusceptibility at 13% and 19% respectively. During 1998-2000 penicillin resistant pneumococci, vancomycin resistant enterococci and MRSA were at the rate of 47-48, 3-7 and 22-39%. The significance increase of resistance were noted in *S. pneumoniae* isolated from sterile site of children <5 years old from 34% in 1998 to 59% in 1999. MRSA isolated from patients seen at OPD increased from 10% in 1998 to 34% in 2000.

**CONCLUSION** The data from NARST provides useful information on threatening the future crisis of antibiotic resistant which will promote the awareness and concern on rational use of antibiotic and containment of antimicrobial resistance in the country.

**I-14****Susceptibility To Antibiotics of *Haemophilus Influenzae* Isolated From Patient With Acute Respiratory Infections - Study From 4 Hospitals and Center In Ho Chi Minh City**

**LUONG THI CUC\*, PHAM HUNG VAN\*\*, et al.**

\*Ear-Nose-Throat Center in HCMC, Viet Nam,

\*\*University of Medicine and Pharmacy in HCMC, Viet Nam

A study has been set up at 3 hospitals and center in Hochiminh city to detect the *H. influenzae* causing acute respiratory infection in outpatients. The received results said that *H. influenzae* were found in 22%, 21% and 57% patients with clinical manifestation of acute lower respiratory infection (Nguyen Tri Phuong hospital), acute upper respiratory infection (ENT center), and children with acute lower respiratory infection (Children hospital No.2), respectively. Nearly 100% of the isolates are sensitive to Cefaclor, the second generation cephalosporin. From 50% to 60% are resistant to Ampicillin and the mechanism of resistance is  $\beta$ -lactamase producing. To Co-trimoxazol, which is recommended by WHO as the first of choice antibiotic for treatment of acute respiratory infection, 60% to 80% of the isolates are resistant. The studied results could conclude that Cefaclor instead of Ampicillin and Co-trimoxazol should be prescribed to the patients with clinical manifestation of acute respiratory infection.

**I-15****The Status of Infectious Diseases and Antibiotic Resistance Reported at the Polyclinic Hospital**

**Nguyen Quang Chieu\*  
Do Quang Mach\***

\*The Binh Thuan Polyclinic Hospital.

Since the physicians at Binh Thuan Polyclinic Hospital have alarmed status of the failure in antibiotic treatments on patients with infections and infectious diseases. The clinical laboratory of microbiology has performed the prospective study on the data saved at the laboratory. The received results have reported that: During the recent 5 years, the clinical laboratory at the Binh Thuan Polyclinic Hospital have isolated 943 bacterial pathogens from different clinical specimens. Among those isolates, 22.5% (213) are identified as *Pseudomonas* spp, 18.45% (174) are *Staphylococcus aureus*, 17.5% (165) are *Escherichia coli*, 6.9% are *Enterobacter* spp, 6.25% are *Proteus* spp, 5.1% are *Klebsiella pneumoniae*, and 25.23% (219) are other identified bacteria. Most of the isolates are highly resistant to the most common used antibiotics like amoxicillin, cephalixin, chloramphenicol, lincomycin, and chloramphenicol. Most of the Gram negative rods are still susceptible to ciprofloxacin and the 3<sup>rd</sup> generation cephalosporin. None of the *Staphylococcus aureus* are resistant to vancomycin.

**I-17****Antimicrobial Susceptibility for Bacterial Respiratory Infection in Children****Quan Lu**

Shanghai Children's Hospital, Shanghai, China

The susceptibility of 8 antimicrobial agents to *streptococcus pneumoniae*(SP), *Haemophilus influenzae*(HI), and *Staphylococcus aureus*(SA) were detected by K-B diffusion method. And the cephradine minimal inhibitory concentration (MIC) to SP, HI, SA were quantitatively determined by E-test.

**RESULTS** All strains of SP, SA showed susceptible to vancomycin. The percentage of susceptibility for SP, SA to oxacillin was 48.5%, 90.9%, but to cephradine was 72.7%, 90.9%, and to cefaclor was 64.7%, 84.8% respectively. However the percentage of susceptibility to erythromycin was only 6.1%, 43.8%, and to TMP-SMZ was only 6.1%, 42.4% respectively. The rate of susceptibility of HI to ampicillin, cephradine, cefaclor, ceftriaxone was 82.4%, 73.3%, 96.0%, 98.0% respectively, and to erythromycin was only 33.4%. The cephradine MICs for SP, HI, SA had not increasing in the 1990's compared with the 1970's.

**CONCLUSIONS** The antibiotics of first choice are penicillin or cephalosporins in ARI child. For the high resistance of SP, HI, SA to erythromycin and TMP-SMZ, the rational use of antibiotics should be emphasized.

**I-18****Improved Clinical Diagnosis of *P. falciparum* among Children with History of Fever, Who Attended Rural Health Center Jhanagara, SINDH****Siroos Hozhabri**

**BACKGROUND** In rural Sindh, children with fever or history of fever are diagnosed as malaria, and thus many undergo unnecessary anti-malarial treatment with risk of side effects and other diagnoses not fully considered. This study was conducted to identify clinical predictors for malaria and develop a clinical algorithm to more accurately identify malaria from non-malaria cases.

**METHODS** Four hundred thirty eight children aged 0.5 to 10 years attending the rural health center between August 15 and October 5 in Jhanagara, district Dadu, Sindh were recruited. A standard questionnaire was used to record symptoms and duration of child's illness. Each child was physically examined, had their axillary temperature measured, and blood samples were collected from which Giemsa stained thick and thin blood films were prepared and examined for presence of Plasmodium parasites. The sensitivity and specificity of several candidate algorithms for parasitaemia were evaluated using various combinations of identified predictors.

**RESULTS** Fever > 3 days duration had 100% sensitivity and 40% specificity for *P. falciparum* infection and 82% sensitivity and 40% specificity for any plasmodium infection. An algorithm of fever  $\geq$  3 days duration and absence of cough or rigors had 100% sensitivity and 59% specificity for detecting *P. falciparum*.

**CONCLUSION** Alternative malaria case definitions were developed that remained highly sensitive but were somewhat more specific in a low prevalence region. If validated prospectively, this algorithm could prevent misdiagnosis and mistreatment.

*Key words:* Algorithm, Epidemiologist, Malaria, Predictors, Pakistan

**I-19****Quinolone(norfloxacin) Resistance of DNA Gyrase and Topoisomerase IV of *Escherichia coli* Isolated from Environment****Yusun Jung**

Department of Biology, Seoul Women's University, Seoul, Korea

During three months from May to July in 2000, an aliquot of water collected from Chunrang stream was inoculated on BHI and a total of 245 isolates were randomly selected. Among these, 26 isolates were resistant to 32  $\mu$ g/mL norfloxacin. Their quinolone resistance mechanism including quinolone resistance determining regions (QRDR), permeability, and efflux were characterized and randomly amplified polymorphic DNA (RAPD) was performed.

All isolates had a mutation, Ser83Leu in GyrA of DNA gyrase. An additional mutation, Asp87Asn or Asp87Tyr was found in thirteen isolates except one isolate containing a mutation, Val103Ala. All isolates had a mutation at the same residue in ParC of topoisomerase IV, Ser58Ile or Ser58Arg except one which had a mutation Arg97Pro. Strong efflux systems were observed in the extremely resistant isolates. RAPD showed a great variety among isolates.

**I-20*****Haemophilus influenzae* and *Streptococcus pneumoniae* Carriage and Antibiotic Susceptibility Study among Children in Three Hospitals of Beijing, Shanghai and Guangzhou****Yang YH, Lu Q, Hu YY, Yu SJ, Ye QQ, et al**

Beijing Children's Hospital, Shanghai Children's Hospital, Guangzhou Children's Hospital

**OBJECTIVE** To determine the nasopharyngeal carriage rate and the prevalence of the antimicrobial resistance of *H. influenzae* and *S. pneumoniae* among children in different region of China. Methods: Three children's hospital in Beijing, Shanghai and Guangzhou were enrolled in this study. Patients with diagnosis of acute upper respiratory tract infection (AURTI) and age between 1 month to less than 5 years old were selected. Nasopharyngeal samples were collected from these patients for culture. *Haemophilus influenzae* and *Streptococcus pneumoniae* isolates were identified and antimicrobial susceptibility of these isolates was determined using Etest and disk diffusion test.

**RESULTS** The carriage rate of *Haemophilus influenzae* in Beijing, Shanghai and Guangzhou children's hospitals was 36.0%, 26.9% and 16.2%; of *Streptococcus Pneumoniae* was 35.3%, 22.6% and 9% respectively. Ampicillin, cefaclor, tetracycline and trimethoprim/sulfamethoxazole resistant Hi in the three hospitals was 4.8%, 8.6%, 10%; 1.9%, 1.9%, 0%; 38.1%, 12.5%, 14.6%; 7.1%, 37.5%, 45.6% respectively. All Hi isolates were susceptible to amoxicillin/clavulanic acid, cefuroxime, and ceftriaxone. Penicillin, cefaclor, cefuroxime, ceftriaxone, erythromycin, tetracycline, trimethoprim/sulfamethoxazole resistant *S. pneumoniae* isolates in three hospital was 14.6%, 36.5%, 5.3%; 8.7%, 8.7%, 36.8%; 8.2%, 8.7%, 24.6%; 1.0%, 0%, 1.8%; 87.4%, 68.3%, 75.4%; 94.2%, 56.9%, 78.9%; 89.3%, 75%, 70.2%. All *S. pneumoniae* isolates were susceptible to amoxicillin/clavulanic acid.

**CONCLUSION** There was a regional difference in nasopharyngeal carriage of *H. influenzae* and *S. pneumoniae* among children with AURTI in China. It was higher i...

**I-21****Seroetiology of Acute Lower Respiratory Infections among Hospitalized Children in Beijing.**

**Yang YH, Shen XZ, uori-Holopainen E, Leuboulleux D, Peltola H, et al.**  
Beijing Children's Hospital

**OBJECTIVE** Little is known of the etiology of childhood acute lower respiratory infections in China, where the use of antimicrobials is indiscriminate. Trials to change such a policy require etiologic data, especially on the bacteria most relevant to these common diseases. **METHODS** One hundred consecutive infants and children from 3 months to 14 years of age with symptoms and signs compatible with acute lower respiratory infection were studied prospectively in the largest pediatric hospital in Beijing from February to May, 1997. Blood culture, thorax radiography and paired sera from 20 microbiologic assays were taken, and the course of illness was monitored uniformly. Disease severity was graded.

**RESULTS** In 24 cases there was evidence only of bacterial etiology, and in 5 solely viral agents were found; 3 children probably had a mixed bacterial-viral infection. Surprisingly no pneumococcal infection was detected. *Mycoplasma pneumoniae* (n = 21), *H. influenzae* type b (n = 8) and *C. pneumoniae* (n = 7) being the dominant bacteria. All children recovered.

**CONCLUSIONS** Routine use of antimicrobials for these patients seems unjustified. Serologic evidence for the *H. influenzae* type b etiology is encouraging in terms of vaccination, but confirmatory studies are needed.

**I-22****A Study on the Etiology of Acute Lower respiratory Tract Infection in Children**

**Quan Lu**  
Shanghai Children's Hospital, Shanghai, China

The multiple pathogens were studied in 246 LIR cases aged 48d-14y in 1999.

**RESULTS** Viral infections tend to be more common than bacterial infections. Among these patients viruses only account for 124 cases (50.4%), viruses mixed bacteria account for 67 cases (27.2%), *Mycoplasma pneumoniae* was 14 cases (5.7%), but bacteria only was 10 cases (4.1%) and unknown pathogens was around 31 cases (12.6%). It seems possible that the higher level of the serum CRP in bacterial infections than in viral infections.

**CONCLUSION** The viruses and mixed infections are consist of the leading pathogens. In the infants younger than 1 year the mixed infections is higher than it in the other year groups. Determining the serum CRP early maybe helpful in distinguishing bacterial from viral infections.

**I-24****Emerging Antimicrobial Drug Resistance of Major Pathogens Causing Nosocomial Infections at a University Hospital in Taiwan, 1981-1999**

**P-R Hsueh\*, M-L Chen, C-C Sun, H-J PAan, L-S Yang, S-W Ho, C-Y Lee, W-C Hsieh, K-T Luh**  
National Taiwan University Hospital, Taipei, Taiwan

To determine the secular trends and antimicrobial drug resistance in major bacterial pathogens causing nosocomial infections from 1981 to 1999, surveillance data on microbiology of documented nosocomial infections from National Taiwan University Hospital (NTUH) (Taiwan) were analyzed. During this period, 35,580 bacterial pathogens causing nosocomial infections were identified. Overall, gram-negative bacteria remained the predominant pathogens; however, the incidences of fungi rose remarkably. In a comparison of data grouped into four time periods (1981-1986, 1987-1992, 1993-1998, and 1999), *Candida* species considerably increased and ranked first during the latest period (14.4%) as well as in 1999 (16.2%) in the incidence of pathogens causing all nosocomial infections, followed by *Staphylococcus aureus* and *Pseudomonas aeruginosa*. A remarkable increase in incidence of antimicrobial drug-resistant pathogens was found in methicillin-resistant *S. aureus* (MRSA) (4.3% in 1981-1986, 23.9% in 1987-1992, and 58.9% in 1993-1998), cefotaxime-resistant *E. coli* (0% in 1981-1986, 1.5% in 1987-1992, and 6.1% in 1993-1998), and cefotaxime-resistant *Klebsiella pneumoniae* (4.0% in 1981-1986, 14.6% in 1987-1992, and 25.8% in 1993-1998). The frequencies of these three resistant pathogens were considerably higher in isolates from intensive care units (ICUs) than those from non-ICUs (84.6% vs. 48.3% for MRSA, 17.1% vs. 5.1% for cefotaxime-resistant *E. coli*, and 51.1% vs. 18.3% for cefotaxime-resistant *K. pneumoniae* in 1993-1998). The rates of imipenem resistance (percent of isolates from ICUs vs. non-ICUs during the 1993-1998 period) were 24.2% vs. 4.4% for *P. aeruginosa* and 9.7% vs. 5.9% for *A. baumannii* isolates. Incidences of some of these resistant organisms continued to increase in 1999. Etiological shifts in nosocomial infections and an upsurge of antimicrobial resistance among these pathogens in NTUH, particularly those isolated from the ICUs, are impressive and alarming.