

acute pancreatitis (n=3). At study entry, 14 (74%) patients were in the ICU (median Simplified Acute Physiology Score II 45, range 31-65), 19 (100%) received antibacterial therapy and 17 (89%) were colonized with *Candida* (*C. albicans* in 69%; CCI ≥ 0.4 in 1/17 case, 5%). Median duration of CSP Px was 16 days (range 4-46). During CSP Px, 17 (89%) patients remained colonized (*C. albicans* in 68%), but 0/17 developed a CCI ≥ 0.4 . CSP was successful for prevention of IC in 18 (95%) patients. Among 5 deaths, none was attributed to IC. No severe CSP-related SAE requiring discontinuation of Px occurred.

Discussion: The results of this pilot study suggest that caspofungin is efficacious and safe for prophylaxis of intra-abdominal candidiasis in high-risk surgical patients.

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Cultures of Venous Catheter Tips (VCT) from Intensive Care Unit Patients

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Objectives: The aim of this study was to evaluate the incidence of microbial pathogens isolated from cultures of venous catheter tips (VCT) and determine their susceptibility patterns to antimicrobial agents from patients hospitalized in the intensive care unit (ICU).

Methods: During a four year period (2003-2007) 925 VCT were cultured from patients hospitalized in the ICU of our hospital. Patients between 18-60 years aged and were hospitalized for more than 48 hours. Specimens were cultured and evaluated according to the semi-quantitative method (MAKIS) for aerobic microorganisms and fungi. Antibiotic susceptibility testing was performed by the agar disk diffusion method according to CLSI guidelines.

Results: From 925 VCT cultures 158 (17%) were positive. Of them 23% grew *Acinetobacter baumannii*, 22% *Pseudomonas aeruginosa*, 26% *Enterobacteriaceae*, 6% *Enterococcus spp.*, 3% *Staphylococcus aureus*, 16% *Staphylococcus coagulase-negative* and 3% *Candida spp.* 74% of *A. baumannii* and *Ps. aeruginosa* strains were resistant to Carbapenems, 69% to Gentamycin and 81% to Amikacin. Twenty-six percent of *Enterobacteriaceae* strains were resistant to Carbapenems, 24% to Gentamycin and 48% to Amikacin. From *S. aureus* and *Staphylococcus coagulase-negative* isolated strains 60% and 66% respectively were resistant to Methicilin. 22% of *Enterococcus spp.* were resistant to Vancomycin and Teicoplanin (van A).

Conclusions: *A. baumannii* and *Ps. aeruginosa* were the most common isolated pathogens followed by *Staphylococci coagulase-negative*. An elevated percentage of multiresistant strains was observed. The knowledge of the resident microbial flora and their antimicrobial susceptibility profiles is necessary in order to formulate a rational policy in patients with catheter devices.

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Susceptibility Rates and High Level Aminoglycoside Resistance of *Enterococcus* Species Isolated from Intensive Care Unit Clinical Specimens

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Background: *Enterococci* may not be the main pathogens associated with Intensive Care Unit (ICU) patients infections but their

increasing resistance rates to many commonly administrated antibiotics often leads to the need of using a combination of antimicrobial agents when dealing with these infections. Even though aminoglycosides used alone have very low efficiency against these microorganisms, their combination with an antibiotic that targets bacterial cell wall has proved to be successful. Testing for high level aminoglycoside resistance (HLAR) is a laboratory means of evaluating the efficiency of such a combination.

Objectives: To assess antimicrobial susceptibility rates and HLAR of *Enterococcus* strains isolated from ICU patients during one year period of time.

Methods: Between 01-01-2007 and 31-12-2007, 50 *Enterococcus* strains were isolated from different ICU patients' samples (mainly bronchial aspirates, urine, blood and wounds). Identification of bacteria was made by standard laboratory proceedings and susceptibility testing to antimicrobial agents was performed with the disk diffusion test (Kirby-Bauer method) along with the miniAPI system. HLAR test was performed with the disk diffusion test according to the CLSI guidelines with the use of 120 microgram Gentamicin and 300 microgram Streptomycin disks.

Results: *Enterococcus faecium* was the most frequent enterococcal isolate (40%), followed by *Ent. faecalis* (32%), *Ent. casseliflavus* (12%), *Ent. gallinarum* (12%) and *Ent. durans* (4%). All strains were susceptible to vancomycin and teicoplanin while susceptibility rates for quinupristin-dalfopristin were for *Ent. faecium* 40%, *Ent. faecalis* 0%, *Ent. casseliflavus* 0%, *Ent. gallinarum* 66.6% and *Ent. durans* 0%. HLAR is shown in the following table.

	Gentamicin 120 μ g (R %)	Streptomycin 300 μ g (R %)
<i>Ent. faecium</i>	60	90
<i>Ent. faecalis</i>	50	50
<i>Ent. casseliflavus</i>	33.3	33.3
<i>Ent. gallinarum</i>	0	33.3
<i>Ent. durans</i>	100	100

Conclusions: Glycopeptides remain highly efficient while streptogramins showed lower efficiency. *Enterococci* species isolated from ICU patients had high HLAR rates especially in the case of *Ent. faecium*, *Ent. faecalis* and *Ent. durans*. Since high level resistance to aminoglycosides means that these antibiotics will not be synergistic with cell-wall-active agents, testing for HLAR is important for the proper therapeutical approach of these patients.

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Carbapenems and Aminoglycosides Susceptibility Rates of Frequently Isolated Gram-negative Bacteria from ICU Patients

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Background: Gram-negative bacteria are the main pathogens associated with Intensive Care Unit (ICU) patients infections and their increasing resistance rates to multiple antimicrobial agents contribute to high morbidity and mortality rates.

Objectives: To assess susceptibility rates to carbapenems and aminoglycosides of the most frequently isolated Gram-negative bacteria from ICU clinical specimens.

Methods: During one year period of time (1/1/2007 till 31/12/2007) 409 Gram-negative bacterial strains were recovered from different samples obtained from ICU patients (including bronchial aspirates, urine, central venous catheters, blood and

wounds). Bacterial identification was made by routine laboratory proceedings while susceptibility testing was performed with the disk diffusion method according to the CLSI guidelines as well as with the miniAPI system.

Results: *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Klebsiella pneumoniae* were the most frequently isolated Gram-negative bacteria, their prevalence of isolation being 26.6%, 26.1% and 24.4% respectively. Isolation rates for the rest of the microorganisms were: *E. coli* 6.11%, *Proteus mirabilis* 4.4%, *Enterobacter cloacae* 2.44%, *Klebsiella oxytoca* 2.44%, *Serratia marcescens* 1.9% and *Stenotrophomonas maltophilia* 1.4%. Susceptibility rates to carbapenems and aminoglycosides are shown in Table 1.

Table 1

	S %			
	Imipenem	Meropenem	Amikacin	Tobramycin
<i>Ps. aeruginosa</i>	51.3	49.5	61.4	57.7
<i>Acin. baumannii</i>	5.6	9.8	0	0
<i>Kl. pneumoniae</i>	46	46	67.6	20.4
<i>E. coli</i>	100	100	88	88
<i>Pr. mirabilis</i>	100	100	100	100
<i>Ent. cloacae</i>	100	100	100	100
<i>Kl. oxytoca</i>	80	80	100	70
<i>Ser. marcescens</i>	100	100	87.5	87.5
<i>Sten. maltophilia</i>	0	0	0	0

Conclusions: *Acin. baumannii* and *Sten. maltophilia* showed the lower susceptibility rates to tested antibiotics, while *Ps. aeruginosa* and *Kl. pneumoniae* had medium susceptibility rates. For the rest of the bacterial strains carbapenems and aminoglycosides proved to remain efficient. Increasing resistance rates to carbapenems and aminoglycosides among some of the most frequently isolated Gram-negative pathogens from ICU patients underscores the importance of susceptibility surveillance and the appropriate use of antimicrobial agents.

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Bloodstream Infections in Immunocompromised Intensive Care Unit Patients: Patterns of Microbial Resistance

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Background: Bloodstream infections (BSI) are the predominant type of nosocomial infections in Intensive Care Unit (ICU). Multiresistant (MDR) bacteria pose a serious threat to the outcome of ICU patients, especially of those that are immunocompromised.

Objectives: To collect and analyze data of all intrahospital BSI in immunocompromised patients in a polyvalent 10-bed ICU of a tertiary care hospital.

Methods: All BSI episodes that occurred in ICU patients between Aug 2006 and Feb 2008 were studied. Blood samples were obtained on clinical suspicion of BSI, followed-up on signs of changes in clinical and laboratory status.

Results: Among 376 patients that were admitted to an ICU during 18 months, 29 episodes of BSI occurred in 21 immunocompromised patients. Their clinical data were: mean age 57.5±15.1 years, mean APACHE II score 28±10.8 and ICU length of stay 24.21±1 days. 7 patients had undergone solid organ transplantation, 7 patients suffered from malignant disease, 6 were diabetics and 1 was on long-term corticosteroids. 21 of the BSIs were considered primary bacteremias while 8 were catheter-related. 4 were due to fungi (*Candida albicans*) and only one to Gram-positive bacteria (MRSE). 82.7% of BSI episodes were due to Gram-negative bacteria, mainly *Acinetobacter baumannii*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*. 62.5% of the isolates were MDR. Of them,

4/8 *K. pneumoniae* isolates were resistant to carbapenems and susceptible only to aminoglycosides and colistin, 4/8 *P. aeruginosa* isolates were susceptible only to piperacillin/tazobactam and colistin and 3/7 *A. baumannii* isolates were susceptible only to aminoglycosides and colistin. The remaining 4 *A. baumannii* isolates were susceptible only to colistin and rifampicin. 17 patients died, 10 of them due to sepsis-related complications, all having been infected by MDR Gram-negative bacteria.

Conclusion: In a Greek ICU the incidence of Gram-positive BSIs remains fairly low compared to data from other countries. While there is a high frequency of MDR Gram-negative pathogens (similar in immunocompromised and general ICU patients with BSI), no bacterial strain has been found resistant to colistin up to date.

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Nosocomial Infections in Immunocompromised ICU Patients

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Background: During hospitalization in Intensive Care Unit (ICU), immunocompromised patients are exposed to resistant bacteria that may adversely affect their outcome.

Objectives: Data collection and analysis regarding intrahospital infections in immunocompromised patients in a polyvalent 10-bed ICU of a tertiary care hospital.

Methods: We studied all intrahospital infections in ICU patients between Aug 2006 and Feb 2008. Blood, urine and bronchial secretions were obtained on clinical suspicion of infection, followed-up on signs of changes in clinical status.

Results: Among a total of 376 patients that were admitted to ICU during 18 months, 80 were immunocompromised. 31/80 (38.7%) developed a nosocomial infection. Mean age was 57.3±14.8 years, male/female ratio was 22/9, mean APACHE II score was 21±12.9 and average length of stay was 23.1±11 days. The patients were allocated in 5 categories based on the type of immunodeficiency. 11 patients had undergone solid organ transplantation (8 liver, 3 kidney), 11 patients suffered from malignant disease (7 solid tumors and 4 hematological malignancies), 2 had been on long-term corticosteroids, one was splenectomized and 6 were diabetics. 5 among them were considered as high-risk (hematological malignancy and splenectomy), 18 were considered as intermediate risk (solid tumor and organ transplant) and 8 were low-risk (diabetics or on corticosteroids). Nosocomial infections were consisted of 22 bacteremias, 15 ventilator-associated pneumonias, 8 catheter-related infections, 8 intraabdominal infections, 4 surgical site infections, 3 urinary tract infections, 1 pleural empyema, and 1 soft tissue infection. The prevalence of Gram-negative bacteria remains high reaching 80.9% of isolated organisms [12.2% multiresistant (MDR) *Pseudomonas spp.*, 24.5% MDR *Acinetobacter spp.* and 14.3% MDR *Klebsiella spp.*], while only 11.1% were Gram-positive (none MRSA, none VRE) and 8% were fungi. Overall mortality among immunocompromised patients with infection was 58% with 61.1% of deaths being sepsis-related as compared to 45% in the general ICU patients with infection.

Conclusion: Infections in immunocompromised patients is an important problem in ICU. Mortality in immunocompromised patients is higher than that in the general ICU patient population and follows a wide range of nosocomial infections especially due to Gram-negative bacteria.