

## An Observational Study on Causative Agents of Bloodstream Infections at Riga Pauls Stradins Clinical University Hospital Intensive Care Units in 2011

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**Introduction.** Nowadays, healthcare-associated infections (HAI) have become a significant problem and challenge in any health care institution. The four most common issues are urinary tract infection, surgical wound infection, pneumonia and bloodstream infection. Bloodstream infections (BSI) are the most severe of the four most frequent HAI. For the diagnostics of BSI invasive blood cultures are being used. Previous researches have shown that 51% of hospital bloodstream infections are found in intensive care units (ICU).

**The aim.** The aims of the study were: to establish the incidence of the BSI in the ICU of Pauls Stradins Clinical University Hospital (PSCUH) in 2011; to find out the most common etiological agents of bloodstream infections in the ICU and their susceptibility to antimicrobial agents; and to compare the data with other articles and the data from European Antimicrobial Resistance Surveillance System (EARSS) about Latvia from previous years with EARSS participant states.

**Materials and methods.** Data obtained from invasive blood cultures in the ICU of PSCUH in 2011 was analysed. By using *Whonet 5.6* programme, statistical data analysis about frequencies of the etiological agents of BSI and their susceptibility to antimicrobial agents was carried out. Descriptive statistics with *PASW Statistics 18.0* programme was made.

**Results.** From the 1<sup>st</sup> of January, 2011 to the 31<sup>st</sup> of December, 2011 PSCUH were registered 3839 blood cultures were registered at PSCUH, and 736 were discovered as positive. The microorganisms were identified and antimicrobial susceptibility of them was performed. Most blood cultures were from the ICU - 442, followed by transplantation and neonatal units. The highest incidence of positive blood cultures were in the ICU - 38.5% of all the blood cultures. The proportion of all positive cultures were of coagulase-negative staphylococci were 26.4%. From all the positive blood cultures, the five most often isolated species were: *S. aureus* (41%), *K. pneumoniae* (12.9%), *E. coli* (9.8%), *S. epidermidis* (8.2%) and *A. baumannii* (6.9%). An increase in the number of almost all antimicrobial resistance profiles was discovered when compared to the EARSS data about previous years in Latvia and Europe. The most alarming data obtained about *K. pneumoniae* - 82.5% where ESBL-producing isolates *A. baumannii* carbapenem resistance reached 81.8%.

**Conclusions.** In 2011, the frequency of the positive blood cultures at PSCUH ICU was 38.5% of all positive blood cultures. There were no differences in the thesis of the most common isolates, except, significantly high frequency of *K. pneumoniae* - 12.9% of all isolates. There are significant changes in antimicrobial resistance profiles of *K. pneumoniae* and *E. coli* isolates at PSCUH compared to EARSS results for Latvia in 2008, and compared to EARSS results for all Europe in 2011. Results have raised a discussion about infection control measures or incomplete compliance in PSCUH units.