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Bacterial Blood-Stream Infections in Neutropenic Children with Hematologic/Oncologic Disorders at a Tertiary Care Centre in Saudi Arabia

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Background: The aim of this study is to determine predominant pathogens and their susceptibility patterns in our pediatric patients with hematology oncology disorders for proper selection of empiric antibiotic therapy.
Methods: Retrospective chart review of children with hematologic/oncologic disorders and bacteremia between January 1998 and December 2005.
Demographic data, underlying diseases, bacterial isolates, and antibiotic susceptibility were reviewed.
Results: One thousand seventy nine bacteremia episodes were identified. The majority of isolates were GPC (52%) whereas Gram-negative bacteria (GNB) caused five hundred and fourteen episodes (48%). The most occurring GPC was coagulase negative *staphylococcus* (32%), *S. aureus* (24%), *S. pneumoniae* (15%), *Enterococcus* spp. (13%), and *viridans streptococcus* (10%). VRE was not isolated. For the Gram-negative isolates the most occurring were *E. coli* (23%), *K. pneumoniae* (19%), *P. aeruginosa* (18%), *Enterobacter* spp. (9%). The percentage of GNB isolates changed over the years accounting for 41%, 42%, 48%, 44%, 58%, 49%, 47%, and 47% for the years 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005, respectively. The sensitivity patterns for the healthcare associated blood stream infections indicated an increase in susceptibility for gentamicin from 60% to 64% to 74% for 2003, 2004, 2005 respectively; Ceftazidime has shown an increase from 77% in 2003 to 85% in 2004, then a decrease in 2005 to 69%. Cefepime sensitivity showed a slight increase from 77% in 2003 to 81% in 2004 then a decrease to 76% in 2005. Tazocin indicates an increase from 58% in 2003, 64% in 2004 and 80% in 2005. In addition, Amikacin shows an increase in sensitivity from 62.5% in 2003 to 84% in 2004 and 85% in 2005. The changes in susceptibility patterns may be due to the change in the empirical therapy which occurred in June 2003 from tazocin and gentamicin to cefepime and gentamicin.
Conclusions: Our results concur with observations from other studies that in children with cancer GPC is a major causative pathogen of bacteremia, with shift to GNB. These results support the exclusion of vancomycin as part of the initial empiric therapy regime in febrile neutropenic patients.

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Evaluation of a LightCycler PCR Assay for the Detection of Invasive *Aspergillosis* in Pediatric Patients with Onco-hematological Diseases

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Background: Invasive Aspergillosis (IA) is associated with high mortality. Successful outcome with treatment is linked to early diagnosis, but culture and histology are late positive, whereas clinical-radiological signs do not allow a certain diagnosis.
Objective: To evaluate the role of LightCycler PCR in the early diagnosis of IA in pediatric patients who underwent high doses of chemotherapy or hematopoietic stem cell transplantation; furthermore, to evaluate sensitivity, specificity, PPV and NPV of LightCycler PCR compared to ELISA test for detection of galactomannan antigen (GM test).
Methods: 96 patients (mean age 10 years) at high risk for fungal infection or with suspected fungal infection underwent clinical, radiological and microbiological evaluations from January 2004 to October 2005. Microbiological evaluations included GM test and LightCycler PCR test for fungal DNA in blood. A total of 579 blood samples were collected and examined by LightCycler PCR with FRET (Fluorescence Resonance Energy Transfer) technique, a very specific method.
Results: 9/96 (9.4%) patients developed IA, classified as 5 proven, 3 probable and 1 possible (EORTC/MSG criteria). Sensitivity, specificity, PPV and NPV of LightCycler PCR were respectively 87.5%, 56.32%, 15.55% and 98% when 1 positive sample was sufficient to consider the test positive, and 62.5%, 86.2%, 29.41% and 96.15% when at least 2 positive samples were required to consider the test positive. Sensitivity, specificity, PPV and NPV of GM test were respectively 50%, 96.2%, 57.14% and 95.06% when 1 positive sample was sufficient to consider the test positive, and 50%, 100%, 100% and 95.23% when at least 2 positive samples were required to consider the test positive. Considering a positive result from GM or LightCycler PCR test (and 2 consecutive positive samples as criterium for positivity), the sensitivity, specificity, PPV and NPV were 75%, 85.18%, 33.33% and 97.18% respectively.
Conclusions: LightCycler PCR had a good sensitivity and a high NPV: if negative, IA is unlikely; GM test