

Bloodstream Infections in Febrile Neutropenic Pediatric Cancer Patients: Microbiological and Sepsis Biomarkers Insight

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The diagnosis of blood stream infections (BSIs) in febrile neutropenic pediatric cancer patients (FNPCP) remains a challenge. Although blood culture is the most accurate method; yet the delay in results has urged the need for reliable biomarkers for early diagnosis. The objectives of this study were to identify the bacterial causes of BSIs in FNPCP at SECI and their antimicrobial susceptibility patterns. Also, to assess the value of procalcitonin (PCT), interleukin 6 (IL6), and interleukin 10 (IL 10) for early diagnosis of BSIs. This study included 68 FNPCP with a total of 85 fever episodes. Blood cultures were done at the onset of fever. Identification of the organisms was carried by Vitek 2 system and the antimicrobial susceptibility testing by disc diffusion. The levels of PCT, IL-6 and IL-10 serum levels were measured by ELISA. Blood stream bacterial infection was detected in 29.4% (25/85). Most were Gram positive cocci in 53.6 % (15/28). There were high percentages of multidrug resistant organism (MDRO) (73.3% and 92.3% among Gram positive and negative bacteria, respectively). The least percentage of resistance was to linezolid (0%) and amikacin (15.4%). The levels of the biomarkers were significantly higher in patients with positive bacterial cultures compared to those with negative cultures ($P < 0.001$). IL -6 had the best sensitivity (96%) (AUC 0.975, cut off 0.925ng/L) with considerable specificity (88.3%). Combined PCT & IL-6 had the highest sensitivity (96%) and specificity (98.3%). We conclude that the percentage of BSIs among FNPCP was considerable. Gram positive bacteria were the commonest causes. High percentages of MDRO were reported. The most efficient antimicrobials were linezolid and amikacin. IL-6 alone had the best sensitivity for early diagnosis of BSIs. The combination of PCT and IL 6 showed the best performance.