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Early diagnosis of bacterial infections in surgical patients. Use of pathfast presepsin assay

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Introduction: Surgical patients are vulnerable to infectious complications during hospitalization because of several factors. Sepsis seems to be a common complication in the postoperative period, and prompt recognition and early intervention are effective ways of reducing mortality in this condition. Various biomarkers have been studied for diagnosing bacterial infections with aim to stop sepsis cascade. Presepsin, which is approximately 13 kDa, has been identified as a protein whose levels increase specifically in the blood of sepsis patients. Additionally, the measurement of presepsin concentrations is useful for evaluating the severity of infection and also for monitoring the clinical responses to therapeutic interventions. In this study, we evaluated the analytical and clinical performance of PATHFAST Presepsin assay system based on the chemiluminescent enzyme immunoassay (CLEIA) principle and its usefulness in the early diagnosis of infection in surgical patients.

Material and Methods: We studied 30 adult patients who underwent surgery between November 2011 and January 2012. During this period 17 organ transplants with a graft from cadaveric donor (8 liver transplant, 8 kidney transplant and 1 lung transplant) and 13 abdominal surgical patients were included in this study. Mean age of patients was 53,6 years[range 19-70 yrs], 13 female and 17 male. The heparinized whole blood for PATHFAST Presepsin (PFP) assay was used in the evaluation at 72 hours after surgery. Blood cultures were performed in all patients at moment that PFP test was performed.

Results: The mean Presepsin level (Pl) in the 26 patients was 3062,77 pg/mL[range 255-20000 pg/mL]. In particular, in transplant patients Pl was 3034,43± 2880,791 pg/mL[range 894-10000 pg/mL]. All the transplants patients resulted positive at PFP test. Microbiological findings confirmed the presence of bacterial infections within 69±2,5h from enrolment. When the test was performed, 65% transplant patients no showed signs or symptoms of infection. While, in four abdominal surgical patients, the PFP test resulted negative [mean value 325 pg/mL; range (255-370 pg/mL)]. These data were confirmed by negative blood coltures. The PFP test was positive in the six remaining patients with Pl mean value 4963±7653,88 pg/mL [range 578-20000 pg/mL] with absence of signs or symptoms of infection in 25% of patients. Even these 6 patients had positive blood cultures within 67±1,8h from enrolment.

Conclusions: Early diagnosis is essential to improving the results of treatment of infections in particular in transplant recipients where infection represents one of the primary barriers to successful organ transplantation. PFP test highlighted a complete sensitivity(100%) in showing the presence of infection in a very short time (15 min), confirmed by the results of positive blood cultures. Based on the results of the present study it appears that presepsin will soon be widely used as a diagnostic marker of bacterial infection in clinical settings. A greater number of patients is necessary to confirm these data.

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