

Use of Selected Cytokines in the Early SIRS/MODS Diagnostic Testing at Patients after Trauma

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Abstract : Post-traumatic mortality rates are still very high and show an increasing tendency. Early identification of patients at high risk of severe complications has a significant impact on treatment outcomes. The aim of the study was to better understand the early pathological inflammatory response to injury and infection and to determine the usefulness of the assessment of TNF- α and sTNFR1 concentrations in the peripheral blood as early indicators of severe post-traumatic complications. The study was carried out in a group of 51 patients after trauma treated in the ED, including 32 patients that met inclusion criteria for immunological analysis. Patients were divided into two groups using the ISS scale (group A with ISS \geq 20, group B with ISS <20). Serum levels of TNF- α and sTNFR1 were determined after admission to the ED and after 3, 6, 12 and 24 hours. The highest TNF- α and sTNFR1 concentrations in both groups were recorded at admission and were significantly higher in group A compared to group B (A vs B TNF- α 2.46 pg/ml vs 1.78 pg/ml; sTNFR1 1667.5 pg/ml vs 875.2 p<0.005). The concentration of sTNFR1 in patients with severe complications was significantly higher compared to patients without complications and preceded clinical symptoms of complications (C+ vs C- 1561.5 pg/ml vs 930.6 pg/ml). Spearman's correlation showed a statistically significant positive correlation between the baseline concentrations of IL-6 (r=0.38, p<0.043) and sTNFR1 (r=0.59, p=0.001) and the ISS scores. The high diagnostic sensitivity calculated from the ROC (receiver operating characteristic) curves was found for the concentrations of both cytokines: TNF α (AUC=0.91, p=0.004) and sTNFR1 (AUC=0.86, p=0.011). Elevated levels of sTNFR1, determined in the peripheral blood shortly after injury, is significantly associated with the occurrence of later complications, which in some patients lead to death. In contrast, high levels of TNF- α shortly after injury are associated with high mortality.

Keywords : cytokine, SIRS, MODS, trauma

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