

The role of HLA-DR expression on monocytes and Sepsis Index as predictive sepsis biomarkers

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Abstract

Sepsis is characterized by a simultaneous imbalance of hyperinflammation and immunosuppression. The expression of HLA-DR in monocytes (MHLA-DR) and CD64 expression in neutrophils (NCD64) are considered, respectively, predictive and diagnostic biomarkers of infection. The ratio NCD64/MHLA-DR has been described as a prognostic biomarker of sepsis. To evaluate MHLA-DR expression and ratio NCD64/MHLA-DR in patients admitted to the Intensive Care Unit (ICU) and their relationship with the development of infection. Prospective study of 77 patients admitted to the ICU from our hospital (HUGTiP) due to stroke or severe traumatic brain injury. The MHLA-DR and NCD64 expression were analyzed in whole blood samples at baseline, +3, +6, +9, +12 and +15 days after admission, using a standardized flow cytometry protocol. During the follow-up, 71% of patients became infected (infection without sepsis, sepsis or septic shock). Infected patients showed – already after three days of admission – a lower percentage of MHLA-DR+ ($85.8 \pm 16.22\%$ vs. $92.5 \pm 12.13\%$, $p < 0.001$) than those patients than did not develop it. Interestingly, on day +3, infected patients also had a higher ratio NCD64/MHLA-DR (0.12 ± 0.19 vs. 0.04 ± 0.08 , $p < 0.001$) than the non-infected ones. The immunomonitoring of MHLA-DR expression and ratio NCD64/MHLA-DR may help to evaluate those patients with higher susceptibility to develop infection and sepsis at the ICU.

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