Cathepsin B: Potential Biomarker for Severe Sepsis Diagnostic

Accardo, C.M.¹; Nogueira-Filho, W.¹,⁴; Pares, M.M.³; Barreto, J.A.³; Nader, H.B.¹; Tersariol, I.L.S.¹,²

¹Depto de Bioquímica, UNIFESP, SP; ²Centro Interdisciplinar de Investigação Bioquímica (CIIB), UMC, SP; ³Associação Beneficente de Coleta de Sangue (COLSAN), UNIFESP, SP; ⁴Hospital das Clínicas Luzia de Pinho Melo, Mogi das Cruzes, SP, Brazil.

Sepsis is a serious medical condition involving infection and generalized inflammation. Several biomarkers have been tested for use in diagnosis and prognostication in patients with sepsis. Cathepsin B serum levels are increased in various inflammatory diseases, in the blood and also in other tissues. However, the diagnostic value of cathepsin B in sepsis has not been defined especially compared to other more established biomarkers, such as C-reactive protein and procalcitonin. We analyzed serum cathepsin B, high sensitivity C-reactive protein (hs-CRP) and seromucoids proteins (total and tyrosin fraction) biomarkers levels in 42 critically ill patients at a medical ICU and 203 healthy controls, with respect to organ dysfunction, systemic inflammation and mortality. Cathepsin B levels were significantly (p< 0.0001) higher in serum of patients with severe sepsis (media 6221 ± 906 UAF/µl, n = 42) than in healthy blood donors (media 325 ± 14 UAF/µl, n = 203). The diagnostic discriminative ability of severe-sepsis for cathepsin B was very high (area under the ROC curve = 0.97± 0.02, 95% confidence interval [0.94-1.00]) and had a best cut-off value of 831 UAF/µl cathepsin B activity (86% sensitivity, 99% specificity) with positive predictive value (PPV) of 95%, negative predictive value (NPV) of 97% and likelihood ratio = 89. Cathepsin B levels significantly correlates with acute phase proteins hs-CRP (Spearman r = 0.3704, P = 0.0048) and with seromucoids proteins (Spearman r = 0.6367, P = 0.0045). These results clearly show that cathepsin B is a new clinically relevant biomarker in sepsis.

Keywords: cathepsin B; sepsis; biomarker; blood donors; hs-CRP.

Supported by: FAPESP, CNPq and CAPES