USE OF CATHEPSIN B, C REACTIVE PROTEIN AND HEMATOLOGICAL PARAMETERS AS BIOMARKERS FOR NEONATAL SEPSIS DIAGNOSIS

Accardo, C.M. ¹; Naufel, H.G. ²; Tersariol, I.L.S. ¹,²

¹Departamento de Bioquímica, UNIFESP, SP; ²Centro Interdisciplinar de Investigação Bioquímica (CIIB), UMC, SP, Brazil.

The current biomarkers used to diagnose neonatal sepsis have a poor positive predictive accuracy. Cathepsin B (CatB) is a lysosomal enzyme related with inflammatory response and cell death process triggered by pathogens. Here we are proposing the CatB serum level as a new biomarker to predict sepsis in neonates. This study includes 108 infants in risk for early-onset sepsis. Major risk factors of neonatal sepsis: maternal colonization with group B Streptococci, rupture of membranes ≥18 hours, maternal sepsis, intra-amniotic infection. Minor risk factors: maternal urinary tract infection, prematurity without known cause, homebirth, absence of prenatal and premature rupture of membrane without labor. CatB activity was measure using the fluorogenic substrate Z-FR-MCA. We also measured the serum level of C-reactive protein (CRP) and hematological parameters. Based on the ROC analysis, we observed that low CatB level (below 28 U/L) clearly defines the absence of sepsis in neonates (sensitivity = 98%, NPV = 98%). The serum level of CatB strongly correlates positively with CRP level (Spearman r = 0.886, p<0.0001). Using CRP high serum level (≥ 1.2 mg/dL) as gold standard for inflammatory response, were observed that a high CatB level (above 28 U/L) clearly identify the presence of inflammatory response (specificity = 98%, PPV = 98%). The serum level of CatB strongly correlates negatively with the number of leukocytes in newborn with inflammation (Spearman r = -0.688, p<0.0001), suggesting that the CatB serum level are related to leukopenia during inflammatory response. We also observed strong predictive values of low hematocrit, low hemoglobin levels; low mean corpuscular volume. Premature infant exhibit relatively decreased erythropoietin levels and a further suppression by sepsis-associated inflammation may induce the anemic status further. We show that a high serum content of CatB can detect both sepsis and inflammatory response in neonates with a high likelihood of sepsis.

Keywords: cathepsin B; biomarkers; neonatal sepsis

Supported by: FAPESP, CNPq and CAPES