Soluble CD14-Subtype (sCD14-ST) Presepsin In Critically Ill Preterm And Term Newborns For The Early Assessment Of Neonatal Sepsis: Preliminary Results

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INTRODUCTION

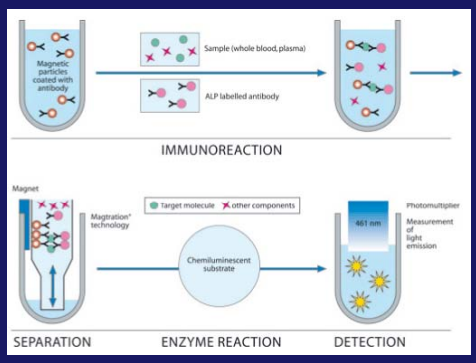
Neonatal sepsis continues to be one of the most significant causes of neonatal morbidity and mortality. Early identification of neonatal sepsis is a major diagnostic problem because of the nonspecific clinical signs and limitations of the current diagnostic procedures. Recently, it was reported that the soluble fraction of CD14 may be a very early, specific biomarker of systemic inflammation and sepsis due to bacterial infection. CD14 is a glycoprotein expressed on the surface membrane of monocytes/macrophages (mCD14) and serves as bacterial lipopolysaccharides receptor. The complex LPS-CD14 (-LBP) is released into circulation, where plasma protease activity originates the soluble CD14 subtype (sCD14-ST) or presepsin. The commercial availability of a very rapid and accurate analytical method for measuring sCD14-ST presepsin calls for clinical studies investigating the potential role of this biomarker in patients with systemic inflammation, sepsis, and severe sepsis. Moreover, there is the need to assess the potential role of sCD14-ST presepsin in predicting outcome in comparison with traditional sepsis and inflammation biomarkers.

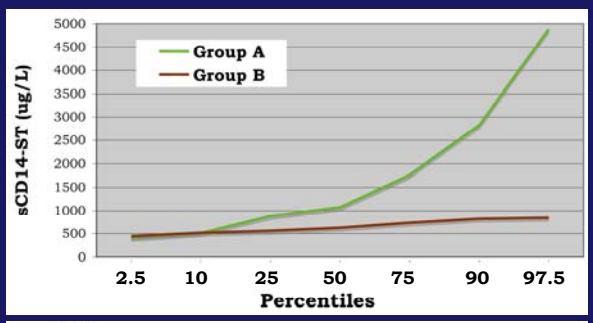
OBJECTIVES

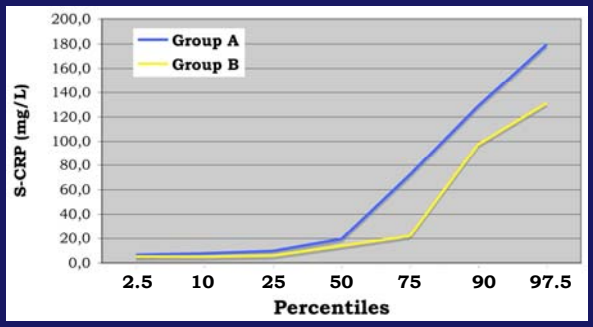
The aim of this study was to evaluate the clinical value of sCD14-ST presepsin in critically ill newborns, admitted in Neonatal Intensive Care Unit (NICU).

MATERIAL AND METHODS

This preliminary study was performed on 30 samples belonging to 13 newborns with gestational age ranging 27 to 36 weeks, admitted on the Pediatric Division, Cagliari. Newborns were divided in two groups: 6 newborns with systemic inflammation/sepsis microbiologically confirmed (gropu A, 15 serum samples) and 7 without sepsis (group B, 15 serum samples). In all the samples we measured C-Reactive Protein (CRP) and sCD14-ST presepsin. CRP was measured by immunonephelometry on the BN II (Siemens Healthcare Diagnostics, Milan, Italy); sCD14-ST was measured by a rapid chemiluminescent enzyme immunoassay on the fully automated PATHFAST® immunoanalyzer (Mitsubishi Chemical Medience Corporation, Tokyo, Japan)







RESULTS

In group A, CRP and sCD14-ST mean values were 50 mg/L and 1578.7 mg/L, respectively (median and interquartile range: CRP 19.5 mg/L, 9.5-72 mg/L; sCD14-ST 1070 mg/L, 880.5-1759 mg/L). In group B, CRP and sCD14-ST mean values were 30.5 mg/L and 638.0 mg/L, respectively (median and i.r.: CRP 14 mg/L, 6.0-22.0 mg/L; sCD14-ST 628 mg/L, 562-736 mg/L). By using the Mann-Witney-U test we found a statistically significance difference between groups for sCD14-ST (p=0.0053) but not for CRP (p=0.327). One baby enrolled in group A died to septic shock 2 days after admission in NICU. In that baby, CRP values were found very increased (up to 65 mg/L) whereas sCD14-ST did not exceed 373 mg/L. However, subsequent investigations together with histology have demonstrated the presence of a disseminate infection from Echo virus 11.

DISCUSSION AND CONCLUSIONS

Our preliminary results suggest a potential interesting prognostic value for sDC14-ST presepsin. In particular, sCD14-ST strongly correlated with the severity of sepsis in all the babies. More important, sCD14-ST did not significantly increase during a viral infection leading to septic shock and death. This result may support the hypothesis on the high specificity of this new marker in assessing bacterial infections and sepsis.

REFERENCES

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