

Category 1 :Sepsis: biomarkers

Category 2 :Sepsis: basic mechanisms

A674 - Can biomarkers help identifying the type of blood stream infection in septic patients?

H Brodska¹; V Adamkova¹; K Pelinkova¹; A Studena¹; J Zavora¹; T Drabek²

¹Charles University, Institute of Medical Biochemistry and Laboratory Diagnostics, Prague, Czech Republic,

²University of Pittsburgh, Anesthesiology, Pittsburgh, United States

Introduction:

Sepsis is one of the most prevalent causes of morbidity and mortality in hospitalized patients worldwide. Early initiation of targeted antibiotic therapy is crucial. Blood stream infections are commonly divided to Gram positive (G+) or Gram negative (G-). However, blood cultures (BC) read-out may be delayed or cultures may be negative (NEG). Biomarkers may help to guide antibiotic therapy prior to BC results [1]. We tested the hypotheses that 1) biomarkers will discriminate between BC- vs. BC+ patients; 2) biomarkers will discriminate between G+ and G-sepsis; 3) biomarkers will correlate with severity of illness.

Methods:

With IRB approval, a patient cohort (n=60) admitted to mixed ICU for suspected sepsis were enrolled in a prospective observational study. BC and biomarkers of sepsis (C-reactive protein, CRP; procalcitonin, PCT; presepsin, PRE; leukocytes, LEU) were assessed and SOFA and qSOFA were determined on admission. Data are displayed as mean±SD or median [IQR]. One-way ANOVA with post-hoc Tukey's test, Kruskal-Wallis test or Mann-Whitney test were used as appropriate. Pearson's test was used to assess correlation between SOFA and biomarkers.

Results:

CRP was the only biomarker different between BC- (33 [3, 64] mg/L) vs. BC+ (147 [51, 256] mg/L) patients (p=0.003). Numerically higher values were observed in G- patients. CRP was higher in G+ (p=0.006) and G- (p=0.023) vs. NEG. PCT was higher in G+ vs. NEG (p=0.037). LEU were higher in G- vs. NEG (p=0.044) and vs. G+ (p=0.015). PRE was not different between groups. (Table 1) In BC- patients, SOFA score did not correlate with any biomarkers. In BC+ patients, SOFA correlated with CRP (p=0.005) and LEU (p=0.023). PRE correlated with SOFA in G+ patients (p=0.032).

Conclusion:

In our limited sample-size pilot study, tested biomarkers showed limited capacity to identify BC+ patients and the type of infection. Higher values of biomarkers observed in G- sepsis warrant further study.

References:

[1] Brodska H et al. Clin Exp Med 13(3):165-70, 2013.

Image 1 :

| | NEG (n=10) | G+ (n=39) | G- (n=11) |
|----------------------------|-------------------|-------------------|---------------------|
| age (yrs) | 53±18 | 64±16 | 77±8†‡ |
| SOFA (pts) | 3.9±2.2 | 4.7±2.2 | 8.1±4.5 |
| qSOFA (pts) | 0.2±0.4 | 0.6±0.8 | 0.9±0.9 |
| CRP (mg/L) | 33 [3, 64] | 144 [49, 246]† | 233 [108, 284]† |
| PCT (µg/L) | 0.26 [0.17, 0.44] | 0.38 [0.16, 3.87] | 14.7 [0.3, 84]† |
| PRE (pg/mL) | 1531 [740, 3421] | 1275 [1039, 2860] | 1772 [1055, 6608] |
| LEU (x 10 ⁹ /L) | 8.3 [6.8, 14.1] | 9.8 [4.4, 16.6] | 21.4 [11.6, 28.7]†‡ |

$\dagger p<0.05$ vs. *NEG*; $\ddagger p<0.05$ vs. *G+*