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New strategies in sepsis diagnosis

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Successful treatment of sepsis begins from early diagnosis and prognosis. In last decades the number of sepsis cases is growing, so establishing early diagnosis of sepsis as well as effectiveness of treatment are very significant. That is why development of new diagnostic sepsis markers is important. In this review we evaluated a new sepsis marker Presepsin (sCD14) and compared it to other markers: Procalcitonin (PCT), C-reactive protein (CRP) and Interleukine-6 (IL-6).

Key words: presepsin, sCD14, sepsis diagnosis, sepsis prognosis, CRP, PCT, IL-6

EARLY SEPSIS MARKERS

The aim of this review is to compare the most popular sepsis markers (Procalcitonin, CRP, IL-6) with the new marker Presepsin.

Procalcitonin is produced in the thyroid gland and lungs, but during bacterial infection a large amount of PCT is also released from other organs. CRP is another widely used infection marker which reflects the acute phase of nonspecific response to inflammation. Its half-life is 19 hours. Other marker, IL-6, is produced by T cells and macrophages. It stimulates the acute immune response to infection and trauma, its half-life is 45 minutes.

Presepsin (soluble CD14-subtype) is present in macrophage, monocyte, and granulocyte cells and their cell membranes, and it is said to be responsible for intracellular transduction of endotoxin signals. Presepsin is produced in association with infection and this occurrence is significantly expressed in sepsis. In a comparative study with other diagnostic markers of sepsis, the results showed that Presepsin was the best, followed by CRP, IL-6, and PCT.

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One of the newest trails was performed by Spanuth E et al. They analyzed data from 146 patients with sepsis. The results showed that Presepsin concentration had the best relationship with the survival rate in 30 days. In addition, a significant correlation was found among the APACHE II scores (an index of disease severity) and the Presepsin values, suggesting that changes of Presepsin concentration in patients' blood can serve as a parameter that closely reflects the severity of pathology.

CONCLUSIONS

Presepsin is a new biomarker in sepsis diagnostics. First investigations showed a high sensitivity and specificity of the diagnosis of early sepsis. And introduction of new methods allowing faster evaluation of Presepsin concentration in patients' blood now enables doctors to get a better assessment of the particular sepsis situation and choose the right tactic, thereby reducing the probability of a bad outcome and monitoring the positive effect of the right treatment.

Reviews of studies have shown that Presepsin levels increase in infection and its correlation with sepsis severity and response to treatment is more informative compared with CRP, PCT and IL-6.

To fully confirm Presepsin as a trusted biomarker of sepsis in acute cases requires more attention by researchers and more controlled trials should be carried out. However, it is already clear that Presepsin can be successfully used in diagnosing sepsis and determining its severity and prognosis in clinical practice.

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NAUJOS SEPSIO DIAGNOSTIKOS STRATEGIJOS

Santrauka

Sėkmingas sepsio gydymas prasideda ankstyva diagnoze ir prognoze. Pastaraisiais dešimtmečiais sepsio atvejų skaičius išaugo, taigi ankstyvos sepsio diagnostikos, taip pat ir veiksmingo gydymo, įtvirtinimas yra itin svarbus. Ypač svarbu atrasti naujus diagnostinius sepsio žymenis. Šioje apžvalgoje mes įvertinome naują sepsio žymenį – presepsiną (sCD14) ir palyginome jį su kitais žymenimis: prokalcitoninu (PCT), C reaktyviu baltymu (CRB) ir interleukinu-6 (IL-6).

Raktažodžiai: presepsinas, sCD14, sepsio diagnozė, sepsio prognozė, CRB, PCT, IL-6