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New Data Confirms the Clinical Benefit of PSP for the Diagnosis of Severe Infections

Critical Care, the top-ranked open access journal in the field of critical care medicine, published the results of a study led by Lausanne University Hospital's Dr Philippe Eggimann and Bern University Hospital's Dr Yok-Ai Que this month [1]. The authors analyzed pooled data from five cohorts showing that the Pancreatic stone protein (PSP) biomarker outperforms both C-reactive protein (CRP) and procalcitonin (PCT), two canonical markers of infection, to diagnose severe infection in hospitalized patients.

The context

Severe infections are a leading cause of morbidity and mortality in hospitalized patients. Early detection of life-threatening infections is crucial to improving outcomes. When not treated timely and adequately, severe infections may evolve towards life-threatening sepsis. To date, none of the blood biomarkers or immune response signatures that have been investigated is able to detect severe infection or sepsis early enough and with acceptable certainty. Therefore, there is an essential need for novel biomarker-based rapid diagnostic solutions to help clinicians identify severe infection and sepsis in a timely and accurate manner.

What was known before the study?

PSP has been thoroughly evaluated in several patient populations and different clinical settings and repeatedly shown to perform better than CRP, and at least as well as PCT in identifying patients with infection. PSP is able to diagnose infection and sepsis, characterize severity, and predict outcome [2].

What new evidence does this study provide?

To date, the majority of clinical studies on PSP have been monocentric, of relatively small size, and focused on a specific group of patients. This meta-analysis at the individual patient level confirms the superior diagnostic performance of PSP for infection in hospitalized patients compared to CRP and PCT. Furthermore, and importantly, the heterogeneity of the cohorts (intensive care unit and emergency room patients from multiple countries with various reasons for hospitalization) and the size of the study (more than 600 patients), allows for the generalization of the results.

How was the study designed?

This is an individual patient-level meta-analysis of data published from 5 cohorts that included adults admitted to either an emergency room or an intensive care unit. PSP, CRP and PCT were measured to diagnose infection. A total of 631 patients were included, among which 371 had an infection. The diagnostic performances of PSP, CRP and PCT were determined by receiving-operator characteristic curve analysis.

What are the implications of these results?

There is a growing body of evidence supporting a higher value of PSP over existing markers to identify severe infection and sepsis correctly. Interestingly, the publication of this meta-analysis mirrors another recently published study in critically ill adults that demonstrated an association between a continuous increase of PSP and the development of nosocomial sepsis [3]. This association was markedly stronger for PSP than for CRP and PCT. At the time of the clinical diagnosis of sepsis, the sensitivity, specificity and accuracy of PSP were similar to CRP and PCT. This study concluded that serial measurements of PSP on critically ill adults may help to identify sepsis earlier.

In parallel to biomarker research, biosensor technology advancements lead to rapid, affordable and robust point-of-care platforms. These technologies offer Clinicians unprecedented opportunities to monitor their patients' biochemical parameters at the bedside and to make

immediate, informed decisions by circumventing the delays imposed by the logistics of biomarker measurements in central laboratories. Abionic SA offers an in vitro diagnostic platform, the CE marked abioSCOPE, on which PSP is measured within minutes at the patient's bedside from a drop of whole blood [4].

Combining a biomarker of high diagnostic value with a rapid point-of-care platform is undoubtedly the ultimate approach to improve the diagnosis of severe infection and sepsis. This opens new perspectives in the management of patients with severe infection and sepsis, in particular regarding the tailoring of antibiotherapy.

Note: The IVD CAPSULE PSP in vitro diagnostic assay on the abioSCOPE point-of-care platform reports values that are not interchangeable with the research-use only ELISA used in the cohorts of the meta-analysis. Consequently, the proposed cut-off of 44 ng/ml cannot be directly used in the abioSCOPE. By extrapolating the PSP values from the ELISA to the abioSCOPE PSP assay, the corresponding cut-off would be approximately four times higher. Each User must refer to the product insert of the IVD CAPSULE PSP regarding the indication for use and the diagnostic performances of the assay.

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Source: Abionic

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