Using Biomarkers for Mortality Prediction in Patients With Sepsis

Sepsis has always carried high mortality. Even today, with all the latest technology and newer antibiotics, sepsis continues to be a major risk factor for death. It is important to understand that the earlier sepsis is diagnosed and treated, the better the prognosis. Each year, nearly 6 million people die of sepsis in the US. Because of its aggressive course, sepsis necessitates early diagnosis and immediate treatment.

Despite enormous research, no specific markers for sepsis have been identified. Factors like white cell count, fever, elevated erythrocyte sedimentation rate, and CRP are non-specific and are often not present in the early stage of the infection.

Without specific markers, it is difficult for clinicians to determine which patients are likely to improve and which will have a poor outcome. Treating everyone empirically with antibiotics and supportive measures is a costly endeavour, and often, not effective in some patients. In this study, researchers looked at the role of six biomarkers and their ability to predict death in adult patients with sepsis.

The six markers that were selected include Angiopoietin-1 (Ang-1) and 2 (Ang-2), high mobility group box 1 (HMGB1), soluble receptor for advanced glycation endproducts (sRAGE), soluble triggering receptor expressed on myeloid cells 1 (sTREM1), and soluble urokinase-type plasminogen activator receptor (suPAR). These markers have been shown in several studies to predict all-cause mortality in patients admitted to the ICU.

Study researchers conducted a systematic review and meta-analysis of published studies. The aim of the review was to assess the prognostic value of these biomarkers for mortality in adult patients with sepsis. The only inclusion criterion for the analysis was that only studies that provided biomarker concentrations within 24 hours of admission in septic and nonseptic patients were included. The results were then evaluated, and a pooled mean difference between non-survivors and survivors was calculated. 28 studies were included in the analysis.

What they observed was that the serum markers Ang-1, Ang -2 and suPAR provided meaningful prognostic data about mortality in adult patients with sepsis. In addition, they noted that these biomarkers were comparable in their ability to predict mortality with the current day biomarkers like procalcitonin or the use of Clinical Tools like the Sequential Organ Failure Assessment (SOFA) score. It was also observed that all six biomarkers had markedly higher negative predictive values than positive predictive values.

Overall, these findings suggest that Ang-1, Ang-2, and suPAR can provide beneficial prognostic information about mortality in adult patients with sepsis.

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