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Sepsis in the ICU: are we missing the basics while chasing biomarkers?

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Sepsis remains one of the most challenging issues related to the intensive care unit, where the morbidity and mortality remain high, despite progress in diagnostic and treatment. Early identification, early administration of antibiotics, vigorous fluid therapy, source control, and following up with evidence-based bundles are the best approaches to use in mortality reduction. Sepsis is a potentially fatal syndrome of dysregulated host response to infection, which is one of the major causes of ICU hospitalizations all over the world.[1] The quest to develop biomarkers has provided hope in the context of precision medicine, the daily routine of sepsis care regularly fails in its simplest processes, which raises a major divide between aspiration and practice.[2]

Sepsis identification is one of the keys to survival. Simple observations at the bedside, like fever, hypotension, altered mental status, and high respiratory rate, are frequently made before laboratory confirmation is done.[3] But these warning signs are not kept in mind in the hectic ICU setting, and thus, the diagnosis is postponed. Conversely, the use of biomarkers like procalcitonin, C-reactive protein, or new genomic panels can only help to refine the diagnosis but will never substitute close clinical monitoring. The excessive use of tests may cause a shift in the focus to bedside evaluation and immediate treatment start.[4] The early application of antibiotics is also among the most predictive factors of sepsis survival. It is consistently evident that each hour of delay results in more deaths, but the delays in antibiotic use remain present in ICUs. Issues such as slow identification, complicated prescribing regimes, and the fear of antimicrobial resistance are some of the factors.[5] Although stewardship is vital, indecisiveness at the point of care disfavors the results. The need to hasten to biomarkers to direct the use of antibiotics is important, but it should not interfere with the urgency of the use of empiric therapy in cases of suspected sepsis.[6]

Another sepsis pillar is fluid resuscitation. Sufficient volume resuscitation serves to restore the perfusion of tissues and avoid multi-organ failure. Although developed biomarkers are expected to improve hemodynamic evaluation, basic bedside measurements, including urine output, blood pressure, and capillary refill. Either of these fundamentals will lead to aggravation of shock, no matter how sophisticated the laboratory is.[7,8] Another area in which delay, as a direct cost of life, is involved is source control, be it surgical drainage, removal of infected lines, or debridement. Biomarker-based surveillance will never be able to replace prompt intervention in the eradication of the focus of infection.[9] Compliance with sepsis bundles (suggested by the Surviving Sepsis Campaign) has proven to have a great survival benefit. Nevertheless, the compliance with bundles is still inconsistent in most of the ICUs.[10] The interest in biomarkers can be explained by the individualized care. Procalcitonin, presepsin, and new transcriptomics may be the keys to differentiating between bacterial and viral infections, setting antibiotic courses of action, and forecasting.[11] The contrast of resource-limited settings is even more apparent. Several ICUs do not have good access to biomarker testing, but survival rates can increase significantly through the focus of clinicians on the early recognition and bundle compliance.[12]

To sum up, the current situation with sepsis in the ICU demonstrates the lack of balance between innovation and implementation. Although biomarkers provide

promising prospects of precision medicine, the principles of sepsis care, such as timely detection, early antibiotics, fluid replacement, source control, and bundle compliance, are the strongest predictors of survival. The assurance of steady implementation of developed practices should be the priority, and only on it, the promise of biomarkers can constructively be based.

Conflict of interest

Authors declare no conflict of interests.

Author's contribution

All ICMJE roles were contributed equally by both authors.

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