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Sorbents therapies in burn patients with septic shock on continuous kidney replacement therapy: an added value for a selected population

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Dear editor,

We read with great interest the review addressing the issue of the use of extracorporeal blood purification therapies in sepsis [1]. We congratulate the authors for their excellent work. There are issues that we want to highlight and comment on.

The authors highlighted the extreme difficulty in demonstrating the effectiveness of these therapies in large randomized studies, with mortality as the primary endpoint. Practical experience teaches that in critically ill patients the effectiveness, in terms of survival, of some therapeutic approaches with great clinical impact (volume filling, the use of diuretics, extracorporeal replacement treatment, and so on) can be very different from patient to patient, resulting in the same treatment being beneficial to one patient, and not beneficial, or even deleterious for another patient. Treatment must be directed at targets tailored for the individual patient, not at common target values that may be appropriate for some but certainly not for all [2].

Among these therapies, the potential benefits of coupled-plasma filtration adsorption (CPFA) were first

documented in patients with Acute Kidney Injury (AKI) on Continuous Kidney Replacement Therapy (CKRT) [1] and later confirmed in a cohort of burn ICU patients undergoing CKRT [3]. A significant reduction in mortality was observed in the group of 39 burn patients treated with CKRT-CPFA, compared to the group of 87 patients treated with CKRT alone (51.3% and 77.1%, respectively). Then, the next Compact-2 study, which compared patients with septic shock treated with CKRT-CPFA (CPFA-CKRT group) as an adjunctive therapy and patients who did not receive it (control group), could not confirm the benefit. The study was prematurely stopped because of a suspected excess of early mortality in the CPFA-treated group, particularly present in the CPFA-CKRT group among patients without renal failure, who would not have required per se the renal replacement therapy [1]. As an explanation of these surprising results, it has been hypothesized that extracorporeal therapy could eliminate a significant portion of antibiotics, particularly when an absorptive component was associated with it. Concerning a life-saving antibiotic such as colistin, during CPFA-CKRT plasma perfusion was very efficient in removing the drug, as the post-cartridge colistin concentration was not detectable [3, 4]. Therefore, CPFA could be harmful to subject a patient with septic shock but good renal function. Because of CPFA-CKRT doubling the purifying function some substances such as antibiotic therapy at standard dosage could be eliminated at an excessive rate [1, 4].

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Nowadays CytoSorb[®] is one of the most promising sorbent therapy currently available for septic shock. Recently it has been documented that in burn patients on CKRT with septic shock, and poorly responsive to therapy, an additive CytoSorb[®] treatment was associated with an improvement in clinical outcome and reduced in-hospital mortality in comparison with subjects treated with CKRT alone [5]. The application of CytoSorb[®] took place in a very dispersed way over the time of admission. Out of 11 patients, 7 started the CKRT together with the sorbent application, and 2 patients needed repetitive cycles, with additional treatments. Cytosorb[®] was tailored to the clinical condition of every single patient, applying a repetitive cycle of treatment following several septic shock episodes.

It is conceivable that the sorbent technologies acting as a rescue therapy were able to overcome the microvascular derangement related to septic shock, it reaches stabilization of patient hemodynamics, and so time was gained for the other crucial interventions for burn patient's survival such as surgery and antibiotics [5].

As already underlined, the selection of patients and the time of intervention may be crucial for demonstrating the efficacy and clinical impact of a new treatment option in ICU patients [2]. In this scenario, burn patients are a particular population, in which the initial injury is defined in its pathophysiological characteristics, and quantifiable in its severity, probability of sepsis, and death. In large trials involving generic ICU patients, these conditions are lacking, many potential confounding factors can influence the result, such as the use in unselected patient populations, variability in demographic characteristics, comorbidities, use of medication, time since disease onset, source of the infection, or duration of therapy.

As in the past likely occurred, the introduction of innovative therapies in ICU patients led to "throwing the baby out with the bath water". Judiciously applying these new therapies in very controlled conditions and selected populations may be the only correct way forward.

Abbreviations

CPFA	Coupled-plasma filtration adsorption
AKI	Acute kidney injury
CKRT	Continuous kidney replacement therapy

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All authors give the consent to publish.

Competing interests

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