**Early and Intensive Hemoadsorption in Septic Shock: Real-World Insights from a Single-Center Study**

**Understanding the Role of CytoSorb® in Critical Care**

Septic shock continues to pose a major challenge in intensive care medicine, with high mortality rates despite advances in supportive therapy. Against this backdrop, a recent retrospective study offers important insights into the clinical use of CytoSorb hemoadsorption in patients with septic shock.

This large, single-center study—conducted over seven years (2016–2023)—reviewed outcomes in 175 septic shock patients treated with CytoSorb. It represents the most extensive dataset from a single center to date, offering a real-world look at how timing and intensity of treatment can influence survival.

**Study Design and Patient Groups**

The goal of the study was twofold:

1. To examine clinical outcomes associated with CytoSorb use in septic shock.
2. To assess the impact of treatment timing and dosing on patient mortality.

Patients were categorized into four main groups:

* **Early Starters:** CytoSorb initiated within 24 hours of septic shock onset.
* **Late Starters:** Initiation between 25 and 48 hours after shock onset.
* **High-Intensity Treatment:** Patients who received three or more adsorbers.
* **Low-Intensity Treatment:** Those treated with one or two adsorbers.

In addition to these groupings, the researchers also calculated the **Amount of Blood Purified (ABP)** for each patient, providing a measure of total treatment dose.

**Key Findings**

**1. Survival Benefit Compared to Expected Mortality**

Despite the high-risk nature of the cohort, the observed **ICU mortality rate was 49%, significantly lower than the 66% predicted by the SAPS score.** This suggests a positive association between CytoSorb Therapy and patient outcome.

**2. Timing and Intensity Matter—Especially Together**

Patients who began CytoSorb treatment early **and** received high-intensity therapy (≥3 adsorbers) had a particularly favorable outcome:

* Their observed ICU mortality was **30%**, compared to an expected **63%**.
* They also showed improved clinical parameters at the end of CytoSorb Therapy: lower lactate levels, higher mean arterial pressure (MAP), and reduced need for vasopressors.

This highlights a clear trend: earlier and more intensive hemoadsorption treatment may be linked to more pronounced clinical improvement and, ultimately, better survival.

**3. Dose-Response Relationship**

One of the standout observations was a **dose-dependent survival effect**. As the total volume of purified blood increased (measured by treatment time and blood flow rate), mortality rates decreased. This supports the idea of a **dose-effect relationship** with CytoSorb Therapy—an important consideration for treatment planning.

**4. Timing Remains Relevant**

While treatment intensity had the stronger influence, early initiation still played a meaningful role. The study suggests that the relatively short delay to CytoSorb treatment start of a maximum of 48 hours may have limited the observable differences in timing alone. Nevertheless, combining **early start with high intensity** yielded the most notable survival benefit.

**Clinical Parameters and Observations**

Survivors, compared to non-survivors, showed improvements in key clinical indicators:

* **MAP** increased during treatment.
* **Lactate**, **C-reactive protein**, and **procalcitonin** levels decreased.
* **SOFA scores** improved.
* **Noradrenaline doses** were significantly reduced.

These changes point toward improved hemodynamic stability and reduced systemic inflammation.

**Take-Home Messages**

This real-world study offers several practical takeaways for ICU teams managing septic shock:

* **Patient selection is key.** CytoSorb appears particularly beneficial in patients with septic shock, aligning with previous findings from recent meta-analyses.
* **Treatment intensity matters.** Using at least three adsorbers—and thus increasing the overall dose—was associated with better outcomes.
* **Early initiation strengthens outcomes.** While high dosing had a stronger effect, starting CytoSorb within 24 hours still contributed to improved survival.
* **There’s potential for even more.** The standard exchange interval in this study was 24 hours. With current treatment protocols recommending shorter exchange intervals, future outcomes may be even more favorable.

**Conclusion**

The results from this large single-center experience reinforce CytoSorb’s role as a valuable adjunct in the management of septic shock. By emphasizing timely initiation and adequate dosing, clinicians can potentially enhance survival in critically ill patients. These findings, when considered alongside other studies like the Steindl meta-analysis\*, underscore a consistent narrative: **CytoSorb is most effective when used early, intensively, and in the right patient population.**

\*Berlot et al.,  Real-World Outcomes of Hemoadsorption with CytoSorb® in Patients with Septic Shock: Insights from a Single-Center Study. J Intensive Care Med 2025; epub