

CytoSorb hemoadsorption as a bridging strategy in Acute Liver Failure: A Narrative Review

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Introduction

Acute liver failure (ALF) and acute-on-chronic liver failure (AoCLF) are life-threatening syndromes marked by impaired detoxification, coagulopathy, and multiorgan dysfunction. Accumulation of protein-bound toxins such as bilirubin and myoglobin exacerbates systemic inflammation and organ failure. While liver transplantation remains the definitive treatment, extracorporeal blood purification methods have emerged as effective bridging therapies. Among these, CytoSorb® has shown to be effective in removing hydrophobic molecules such as cytokines, bilirubin, and myoglobin from whole blood. Its potent adsorptive capacity helps to mitigate systemic toxicity, reduce cytokine storm intensity and improve hemodynamic stability in critically ill patients, potentially enhancing survival chances.

Methods

Recent clinical experiences have highlighted the use of CytoSorb in critically ill patients with acute liver failure (ALF) and associated complications such as hepatorenal syndrome and multiorgan dysfunction. In these scenarios, extracorporeal blood purification (particularly continuous veno-venous hemodialysis (CVVHD) integrated with CytoSorb) has been successfully employed as a bridging therapy to liver transplantation. Treatment is typically initiated upon ICU admission in patients presenting with severe hyperbilirubinemia, acute kidney injury, coagulopathy, and signs of neurological and respiratory compromise. Scoring systems such as APACHE IV often indicate high predicted mortality.

Results

CytoSorb therapy has been associated with a progressive and clinically meaningful reduction in circulating bilirubin and myoglobin, contributing to enhanced detoxification and modulation of the inflammatory response. Clinical improvements include reduced vasopressor needs, better hemodynamic stability, and improved metabolic profile supporting organ recovery. The integration of CytoSorb into CRRT platforms has proven technically straightforward, safe, and well tolerated. These findings suggest CytoSorb as a valuable and effective bridge-to-transplant tool in patients with ALF and multiorgan failure, improving short-term outcomes.

Conclusion

CytoSorb represents a promising adjunct in managing hyperbilirubinemia and hypermyoglobinemia in liver failure. By adsorbing protein-bound toxins and inflammatory mediators, CytoSorb contributes significantly to organ stabilization and improved outcomes, especially in high-risk patients awaiting transplantation. Its compatibility with CRRT platforms, prolonged adsorptive capacity, ease of use, and safety profile support broader ICU application.