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SYSTEMATIC REVIEW WITH META-ANALYSIS

Plasma exchange improves survival in acute liver failure - An updated systematic review and meta-analysis focussed on comparing within single etiology

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Abstract

Background and Objective Therapeutic plasma exchange (PLEX) is increasingly used in patients with acute liver failure (ALF) as either stand-alone therapy or bridge to liver transplantation. Etiology plays a major role in prognosis of these patients and benefit of PLEX may consequently differ across etiologies. This systematic review and meta-analysis aims to evaluate the efficacy of PLEX in treating ALF, focussing on studies with single etiology.

Methods We conducted a systematic literature search and identified studies comparing PLEX vs. standard medical therapy (SMT) for patients with ALF across all age groups. The protocol was registered in the International Prospective Register of Systematic Reviews (PROSPERO) (CRD42023442383). Pooled risk-ratios were determined by Mantel–Haenszel method within a random effect model. Primary outcome was mortality at ≤ 60-days and 90 days. Secondary outcome was adverse events attributable to PLEX.

Results Eight studies (pooled sample size in PLEX arm: 284; randomized trials: 2; Comparative cohorts: 6) with retrievable data on ALF were included in this systematic review. Analysis showed that PLEX was associated with significant reduction in mortality at ≤ 60-days (*RR* 0.64; *CI*, 0.51–0.80; $P < 0.001$) and at 90-days (RR 0.67; *CI*, 0.50–0.90; $P = 0.008$) as compared to SMT. On sub-group analysis, the survival benefit was noted irrespective of the volume of plasma exchanged during PLEX.

Three studies (pooled sample size in PLEX arm: 110; all comparative cohorts) were identified, which included patients with a single etiology for ALF. These studies included patients with Wilson's disease, rodenticidal hepatotoxicity and acute fatty liver of pregnancy. Pooled analysis of studies with single etiology ALF showed better reduction in ≤ 90-day mortality with PLEX (RR 0.53; *CI*, 0.37–0.74; $P < 0.001$). Studies reported no major side-effects attributable to PLEX.

Conclusion PLEX is safe and improves survival, independent of the volumes utilized, in patients with ALF as compared to standard medical treatment. The survival benefit is especially pronounced in studies restricted to single etiology.

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