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Modified ultrafiltration versus conventional ultrafiltration in adults undergoing coronary artery bypass grafting-effects on inflammatory cytokine response, rotational thromboelastometry parameters and hemodilution: A randomized controlled trial

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Statement of the Problem: Cardiopulmonary bypass is associated with increased inflammatory system responses and alterations of the hemostatic factors and coagulation system. Modulation of the inflammatory response through medical and non-medical approaches is important in reducing the post-operative complications. In the present study we investigated the outcomes of using Modified Ultra Filtration (MUF) in adults undergoing Coronary Artery Bypass Grafting (CABG) operation.

Method: 56 patients candidate for elective CABG were randomly assigned in two groups including Conventional Ultra Filtration (CUF) and MUF groups. Preoperative and postoperative clinical parameters, serum level of inflammatory cytokines and ROTEM indices were measured pre-operation, after de-clamping of aorta, Intensive Care Unit (ICU) entrance and on 24 and 48 hours after operation.

Findings: Two groups were similar in the clinical perioperative parameters including hemodynamics, transfusions, ROTEM indices, mechanical ventilation and cardiopulmonary bypass (CPB) time and ICU stay. Interleukin (IL)-6, -8 and -10 measures were equal between two groups in all trial measurement points. The levels of inflammatory mediators were significantly increased after CPB in both groups. TNF- α was significantly elevated after CPB compared with de-clamping time ($P < 0.05$). MUF group demonstrated significantly lower level of TNF- α compared with CUF group at the same time ($P = 0.031$). Hemoglobin and hematocrit levels were significantly increased in the MUF group after CPB ($P < 0.05$).

Conclusion: MUF is effective in improving the hemodynamics and hemoglobin level after CPB among patients undergoing CABG. It also modulates the immune response post-operation.

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