Modified ultrafiltration & postoperative course in patients undergoing repair of Tetralogy of Fallot

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Abstract

Background: Expected benefits of modified ultrafiltration(MUF) include increased hematocrit, reduction of total body water & inflammatory mediators, improved left ventricular systolic function, & improved systolic blood pressure and cardiac index following cardiopulmonary bypass(CPB). This prospective randomized trial tested this hypothesis. Methods: 79 patients undergoing intracardiac repair of Tetralogy of Fallot(TOF) were randomized to MUF group(Group-M, n=39) or only conventional ultrafiltration(CUF) group(Group-C, n=40). Primary outcome was change in hematocrit. Secondary outcomes were changes in peak airway pressures, ventilatory support, blood transfusions, time to peripheral rewarming, mean arterial pressure, central venous pressure, inotrope score(IS) and cardiac index. Serum inflammatory markers were measured. Results: Following MUF, Group-M had higher hematocrit(44.3±0.98 g/dl) compared to Group-C(37.8±1.37g/dl),P=<0.001. Central venous pressure(mmHg) immediately following sternal closure was 9.27±3.12mmHg in Group-M & 10.52±2.2mmHg in Group-C(P=0.04). In the ICU, they were 11.52±2.20mmHg in Group-C and 10.84±2.78mmHg in Group-M(P=0.02). Time to peripheral rewarming was 6.30 ± 3.91 hours in Group-M and 13.67 ± 3.91 hours in Group-C(P=0.06). Peak airway pressures in ICU were 17 ± 2 mmHg in Group-M & 20.55±2.97mmHg in Group-C, P<0.001. Duration of mechanical ventilation was 6.3±2.7 hours in Group-M compared to 14.7±3.5 hours in Group-C(P=0.002). IS was 11.52±2.20 in Group-C compared to 10.84±2.78 in Group-M. 8/39(20.5%) patients in Group-M had IS>10 compared to 22/40(55%) patients in Group-C(P=0.02). Serum Troponin-T and Interleukin-6 levels were lower in Group-M; TNF-α and CPK-MB were similar. ICU & hospital stay were similar. Conclusion: MUF group had higher post-operative hematocrit, decreased duration of mechanical ventilation, lower need for inotropes & lower Interleukin-6 & Troponin-T levels. MUF group had better post-operative outcomes.

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