Influence of combined conventional and modified ultrafiltration in neonates on coagulation, hemodynamic and blood loss after pediatric cardiac surgery

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Background: Combined Conventional (CUF) and Modified Ultrafiltration (MUF) in pediatric cardiac surgery with Cardiopulmonary Bypass (CPB) may offer advantages in comparison with conventional or modified ultrafiltration itself.

Methods: From January 2008 to October 2009, a total of 105 pediatric patients undergoing cardiac surgery were collected prospectively and analyzed retrospectively, divided into 2 groups. Group I undergo CUF, group II was CUF + MUF. The using of filtration was randomized. Sub analysis was between patient with Aristotle score above five and preoperative Pulmonary Hypertension (PH). Preoperative, intra operative, during CPB, post-operative data in ICU such as hemodynamics, hemoglobin, transfusion of blood products, Low Cardiac Output Syndrome (LCOS) such as lactate, arterial, vein saturations, mean arterial pressure were compared between groups.

Results: There was one operative mortality. Total patients with CUF (n=52) and CUF+MUF (n=53). Patients Aristotle score above 5 (n=101), median age 24 (1:204) months and median weight 9.5 (4:51) kg. In neonates, CUF+MUF increased hemoglobin level up to 2.1 (-1.6, 8.9 p=0.206) mg/ml post operatively, significantly reduced total transfusion volume of coagulation factors in ICU (RBC 225(90, 360) mL; p=0.099; FFP 110 (60:160) mL; p=0.075; TC 67, 50 (65, 70) m; p=0.365), also increased mean arterial blood pressure 12 (-26, 62) mmHg. Patients preoperative PH (n=95), median age 24 (1, 168) months and median weight 9,2 (4, 44) kg. In neonates, CUF+MUF also increased hemoglobin level up to 2,1 (-1.6, 8.9 p=0.224) mg/ml, but not significantly reduced total transfusion volume of coagulation factors (RBC 225 (90, 360) mL; p=0.154; FFP 110 (60, 160) mL; p=0.104; TC 67,50 (65, 70) mL ; p=0.400), also increased mean arterial blood pressure 11 (-26, 41) mmHg. LCOS have significant lower in all groups. In both groups, ventilation duration longer in CUF+MUF groups, but there was no significant difference among groups in ICU stay, central venous pressure post operatively.

Conclusions: Combination UF is effective and safe in pediatric patients undergoing cardiac surgery, make LCOS decreased, better hemodynamics and coagulation function if compare with other's strategy. We recommend the use of combined UF is safe in high-risk pediatric patients for hemoconcentration after cardiac surgery. Optimal use of combined UF includes patients with preoperative PH and with Aristotle score>5.

Biography

Yopie A Habibie has completed his Bachelor's degree in Medical Majors at Syiah Kuala University Banda Aceh (2005), graduated from Specialist Program 1 (Sp-1) Thoracic Cardiac and Vascular Surgery at the Faculty of Medicine University of Indonesia, Jakarta in 2012. In 2005-2006, he has served as a General Practitioner at Harapan Bunda Hospital, Banda Aceh and also in Refugee's Camp Lhokseumawe. He has under went for advanced fellowship training as Junior Consultant at 2013 for Overseas Adult Cardiac Surgery Fellow at Narayana Health Institute of Cardiac Science's in Bangalore India. In 2014, he has achieved Fellow of Indonesia Heart Association (FIHA) title from Indonesian Heart Association. Currently, he is serving as Medical Staff of Surgical Sciences at Dr. Zainoel Abidin General Hospital, as Head of Thoracic Cardiac and Vascular Surgery and Vice Chairman of Integrated Heart Center of Zainoel Abidin General Hospital. He has engaged actively in various organizations of the European Heart Surgery profession (EACTS), Asia (ASCVTS and ATCSA), American (STS) and WSPCHS. From 2006 up to now, he is appointed as a permanent Lecturer at the Medical Faculty of Syiah Kuala University.

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