**ESTIMATED QUANTIFICATION AND SCIENTIFIC JUSTIFICATION OF THE USAGE OF FRESH FROZEN PLASMA AND HYPERTONIC ALBUMIN DURING CARDIOPULMONARY BYPASS IN NEONATES AND INFANTS**

Isaac Chinnappan, MS, CCP, LCP, FPP, CPBMT, CPBMS

Monroe Carell Jr. Children's Hospital at Vanderbilt, Nashville, Tennessee

Cardiopulmonary Bypass (CPB) intervention alters fluid dynamics in neonates and infants. Addition of Fresh Frozen Plasma (FFP) in the prime and its usage during CPB is a traditional practice. There is a huge variation in FFP and Albumin usage during CPB. Hemodilution and reduction of plasma albumin concentration and low Colloid Osmotic Pressure (COP) are the main factors associated with tissue edema, postoperative weight gain and organ dysfunction. It is well documented and referenced that it is necessary to maintain adequate COP to prevent fluid shift and third spacing in pediatric patients requiring CPB. Optimal COP during CPB is not well known. Different preferences, opinions and thoughts regarding the cinical relevance of FFP and Albumin usage during CPB presents wide variation in clinical practice. The objective of this study is to assess the required quantity and justification of clinical impact of the usage of FFP and hypertonic albumin during CPB in Neonates and Infants.

Protocolized information regarding FFP and Albumin-25% usage during CPB in neonate and infant population were collected from 22 pediatric cardiac facilities. All patients received 25% albumin at different phases of CPB. Patients from 64% of participated facilities received FFP. The pro-coagulant and anti-coagulant effect of FFP and colloid osmotic effect of Albumin 25% with reference to priming volume and total circulating blood volume were estimated. Estimation of possible increase in Fibrinogen due to volume-dose response of FFP addition, blood loss analogous with reduction of COP, need of supplementation of colloids during CPB, isotonic FFP-hypertonic albumin features were analyzed.

Adding FFP in the prime and during CPB probably helps to increase the circulating antithrombin III (AT III) concentration. The estimated volume-dose response of FFP addition did not have any significant clinical benefit. Both FFP and hypertonic Albumin has unique features and will not compensate each other. Same dose of adding 50ml of 25% albumin (12.5gm) for all size patients and priming volume may result in very low albumin level and COP in the prime and perfusate. 5% Albumin and/or FFP are isotonic and are not intended to maintain COP during CPB in neonates and infants. Quantification of FFP in the prime and adding during CPB is optional to treat hypofibrinogenemia.

To conclude, further relevant studies are required to estimate the dosage of FFP and 25% Albumin during CPB to justify its clinical impact. Variations in our current clinical practice of FFP and Albumin usage should have scientific reasoning. FFP is not an alternative to maintain or to integrate or to regulate COP during CPB in neonates and infants. Estimation of FFP dosage is critical to treat deficiency of coagulation factors and/or antithrombin – III in neonates and infants during CPB.