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Retrograde autologous blood priming is an efficient technique without or minimal usage of homologous blood in infant cardiac surgery

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Introduction: Both severities of cardiac surgery and technical features of extracorporeal circulation circuit demands blood transfusion from donors which involves a number of risks for the patient, especially with low body weight. Priming of the cardiopulmonary bypass circuit with patients' own blood [retrograde autologous priming (RAP)] is a technique used to limit haemodilution and reduce transfusion requirements.

Purpose: Aim of this study is to explore the possibilities of reducing the volume of homologous blood transfusion in pediatric cardiac surgery.

Materials & Methods: The study included 250 children (131 boys, 119 girls) with congenital heart disease, operated on heart under CPB, weighting less than 20 kg (20.45±3.15) and 3.4±1.7 years average age, were divided into experimental (125 children) and control group (125 children). In the control group, conventional CPB was performed (supplementing the priming with red blood cells), while in study group CPB was started after RAP via aortic cannula with recuperation till 45% of priming. The hematocrit (Hct), lactate (Lac) levels at two perioperative time-points, and intraoperative and postoperative blood usage were recorded. There were no significant differences in CPB time, aortic cross-clamp time between groups. Cell saver wasn't used in both groups (was not effective in children who underwent cardio surgery).

Results: No hospital lethality occurred in the study and no surgical hemostasis was performed. Blood loss accounted for 6.2 ml/kg/24 h. Postoperative transfusion of homologous blood (erythrocyte mass) as needed 73 children, that makes up only 29.2% of the whole study group. Among children who received transfusion on pump, the number of homologous units of packed red blood cells was less in the RAP group than that in the standard priming group intra-operatively and peri-operatively (0.54±0.17 vs. 1.48±0.68 units, P=0.03; 0.94±0.54 vs. 1.69±0.69 units, P=0.15). There were no significant differences in CPB time, aortic clamp and lac value between the two groups (P>0.05). Clinical outcomes were similar with respect to pulmonary, renal and hepatic function, length of ICU stay and hospital stay.

Conclusions: Priming minimalisation and autologous blood priming, ultrafiltration, could diminish the necessity of perioperative homologous blood transfusion in infant cardiac surgery.

Biography

Eugen Varlan was a Stager Researcher in Scientific Laboratory of Cardio-surgery at Cardiology Institute In 1995 and in November 1995, he successfully performed extracorporeal circulation in cardiac surgery operations. He performed more than 3500 extracorporeal circulations in the majority cases of pediatric cardiac surgery (radical correction of tetralogy Fallot, radical correction of atrioventricular canal, mitral and tricuspid annuloplasty, Glenn and Fontan operations with extracorporeal circulation assistance, switch correction of transposition of grand vessels, mustard operation and Norwood correction). He assisted all adult operations and ECMO. By his insistence, the method of modified ultrafiltration was introduced in practice in the Republic of Moldova.

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