[C-23] Can we achieve bloodless perioperative course in children undergoing cardiac surgery utilizing cardiopulmonary bypass (CPB)?

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Introduction
Our institution is a major center for taking care of the Jehovah's Witness population and had success in achieving the goal of bloodless surgery safely for many of these patients. Our success in caring for these patients allowed us to apply many of the blood conservation techniques that are used in this group of patients such as acute normovolemic hemodilution (ANH), smaller CPB circuits, zero balance ultrafiltration (ZBUF) and modified ultrafiltration (MUF) to our entire cohort of patients undergoing pediatric cardiac surgery utilizing CPB.
Methods:
As a quality initiative to assess our success in achieving bloodless perioperative course for our patients, we retrospectively reviewed our CPB cases over the last 10 months and utilized this data to establish a protocol that would allow us to reduce the need for blood transfusion. Collected data included patients' age, weight, gender, diagnosis and preoperative hematocrit (HCT). Collected intraoperative data included; procedure, risk adjusted congenital heart surgery (RACHS) score, cardiopulmonary bypass (CPB) time, aortic cross clamp time, HCT prior to separation from CPB and at the end of the procedure and the type and volume of blood products received. Postoperative data included coagulation profile and HCT upon arrival to the cardiac intensive care unit (CTICU), chest tube output at 6 hours and at 24 hours postoperatively. In addition we collected type and volume of blood products administered during the CTICU stay.
Results:
A total of 229 patients were included in the data collection. Overall, 102 patients (44.5%) received no blood or blood products during their entire hospitalization. Our highest rate of bloodless perioperative course was in the group of patients above 10 Kg in weight, where 82/112 patients received no blood or blood products during their entire hospital stay (73.2%). When we evaluated those patients who weighed 5-10 Kg who underwent a two ventricles repair, 13/39 patients (19%) had a bloodless perioperative course. Among these patients, there were no significant difference in the age, weight, preoperative HCT and RACHS score between patients who were transfused and those who did not. Patients in that group who did not receive any transfusion had a lower CPB time (80 ± 19 minutes Vs 171 ± 97, P 0.0001) and lower aortic cross clamp time (44 ± 19 Vs 80 ± 41 P 0.001). In addition, in patients who did not receive transfusion, we tolerated a lower HCT on CPB (21 ± 6 Vs 30 ± 6 %, P 0.0004) and at the end of surgery after (MUF) (27 ± 4 Vs 37 ± 6 %, P <0.0001). There were no differences between the two groups as to the chest tube output at 6 hours and 24 hours post procedure. There were no mortalities in the bloodless group of patients.
Discussion:
We were successful to safely achieve bloodless cardiac procedure in almost half of our patients. In an effort to improve our ratio of bloodless procedures, we are targeting patients in the 5-10 kg weight group. We are establishing a protocol for blood transfusion of these patients. This includes establishing a target HCT as a trigger for transfusion of packed red blood cells both in the operating room and in the CTICU. Our goal is to reduce the need for blood transfusion in this group of patients by 50%.
