Research Paper

Relationship between Stroke Volume Variation and Blood Transfusion during Liver Transplantation

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Abstract

Background. Intraoperative blood transfusion increases the risk for perioperative mortality and morbidity in liver transplant recipients. A high stroke volume variation (SVV) method has been proposed to reduce blood loss during living donor hepatectomy. Herein, we investigated whether maintaining high SVV could reduce the need for blood transfusion and also evaluated the effect of the high SVV method on postoperative outcomes in liver transplant recipients.

Methods. We retrospectively analyzed 332 patients who underwent liver transplantation, divided into control (maintaining <10% of SVV during surgery) and high SVV (maintaining 10−20% of SVV during surgery) groups. We evaluated the blood transfusion requirement and hemodynamic parameters, including SVV, as well as postoperative outcomes, such as incidences of acute kidney injury, durations of postoperative intensive care unit and hospital stay, and rates of 1-year mortality.

Results. Mean SVV values were 7.0% ± 1.3% in the control group (n = 288) and 11.2% ± 1.8% in the high SVV group (n = 44). The median numbers of transfused packed red blood cells and fresh frozen plasmas in the high SVV group were significantly lower than those in control group (0 vs. 2 units, P = 0.003; and 0 vs. 3 units, P = 0.033, respectively). No significant between-group differences were observed for postoperative outcomes.

Conclusions. Maintaining high SVV can reduce the blood transfusion requirement during liver transplantation without worsening postoperative outcomes. These findings provide insights into improving perioperative management in liver transplant recipients.

Key words: stroke volume variation; liver transplantation; blood transfusion.

Introduction

Liver transplantation is associated with massive blood loss and blood transfusion that are mainly consequences of the complex surgical procedures and derangements of the coagulation system. Importantly, intraoperative blood loss and subsequent blood transfusion increases the risk for perioperative mortality and morbidity in liver transplant recipients.[1-4] Therefore, minimizing the need for intraoperative blood transfusion represents a key objective for maximizing perioperative outcomes in these patients.

Several strategies have been proposed to reduce intraoperative blood loss and blood transfusion. Several randomized clinical trials have found that restrictive transfusion strategy yields equivalent or superior outcomes compared with a liberal strategy.[5-7] The low central venous pressure technique has been found to reduce intraoperative blood loss and red blood cell (RBC) transfusion during liver...