

Haemolysis and other biochemical evaluations of vacuum-assisted venous drainage in cardiac surgery

Aims of the study: Vacuum-assisted venous drainage (VAVD) improves the quality of venous return in procedures using extracorporeal circulation systems (ECC). Nevertheless, there is not an evidence that such high negative pressure applied to ECC in combination with selective bicaval cannulation due to open heart surgery cause a trauma to blood elements and deteriorates organ function. A prospective randomised study was designed to demonstrate that negative pressure of -20 mm Hg to -80 mm Hg does not cause a significant haemolysis and organ deterioration in such procedures. **Materials and methods:** 85 consecutive patients undergoing combined cardiac surgery procedure with two separate venous cannulas were randomised in three groups A, B and C. VAVD with negative pressure of -20 to -45 mm Hg was applied to 28 patients in group A and negative pressure of -45 mm Hg to -80 mmHg was applied to 28 patients in group B. There was zero negative pressure applied to 29 patients in group C. Six blood samples were taken from each patient and examined for haemolysis and other indicators of organ deterioration such as hemoglobin, platelet count, free hemoglobin, aptoglobin, lactate-dehydrogenase, aspartate-amino-transferase, bilirubin, creatinin. The results were compared in relation to negative pressure being applied to ECC. **Results:** Indicators of haemolysis such as free hemoglobin and aptoglobin as well as lactate-dehydrogenase showed a significant elevation or reduction (in case of aptoglobin) on ECC in all three groups. There was minor haemolysis documented in group B (negative pressure of -45 to -80 mm Hg) at 40 minutes on ECC. There were not found significant differences in level of haemolysis, platelet count, in operative mortality and transfusion volumes among groups A, B and C. **Conclusions:** Results have documented safety of VAVD in cardiac surgery. Analysis did not show VAVD applied to ECC causing a major haemolysis and a trauma to blood elements and other organ deterioration. Author concludes vacuum-assisted venous drainage is a safe and useful method of cardiopulmonary bypass management in cardiac surgery.

Key words: Vacuum-assisted venous drainage, haemolysis, cardiac surgery