

Heparin Dose and Postoperative Bleeding in Patients Undergoing Cardiopulmonary Bypass

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Abstract: Heparin is the most widely used anticoagulant for cardiopulmonary bypass (CPB). Several authors suggest that lower doses of heparin during CPB would produce lower postoperative chest tube losses and fewer transfusion events. In the present study, a heparin dose–response (HDR) test was used to determine the heparin dose for each patient. We hypothesize that higher doses of heparin do not cause increased postoperative bleeding and transfusion events in postoperative patients undergoing CPB when the heparin dose is determined by a HDR test. This prospective observational study followed 66 patients undergoing CPB-supported primary coronary artery bypass grafting. Patients were placed in one of two groups, sensitive ($n = 37$) or resistant ($n = 29$) based on the result of a HDR test slope. Data on patient characteristics, secondary outcomes, transfusion, and the primary outcome, chest tube losses, were collected. Patient characteristics differed in the baseline

activated coagulation time (ACT) and thromboelastograph G parameter as well as number of patients with hypercholesterolemia. The resistant group had lower postheparin and postprotamine ACTs and heparin sensitivity index. Initial heparin dose, total heparin dose, heparin dose per kilogram, HDR, and protamine dose were higher in the heparin-resistant group. The primary outcome, postoperative chest tube loss volume, was collected at four time points and the two groups were then compared. The heparin-resistant group was noninferior to the sensitive group and had clinically fewer transfused patients and transfusion events. The resistant group was noninferior to the sensitive group with respect to chest tube losses at all measured time points. Higher doses of heparin determined by a HDR test do not cause increased postoperative chest tube losses or increased transfusion events. **Keywords:** cardiopulmonary bypass, heparin, bleeding. *JECT. 2013;45:228–234*
