

## **Abstract**

The aim of our two prospective randomized studies was to evaluate and compare haemostatic effects of fibrinolytic inhibitors in patients undergoing off-pump coronary artery bypass surgery (OPCAB). The first study evaluated efficacy of tranexamic acid vs. placebo, the second one compared effects of tranexamic acid vs. aprotinin vs. placebo. In addition, the risk of per operative myocardial ischemia and thrombotic events was assessed.

In the first study postoperative bleeding was significantly lower in the tranexamic acid group compared with the control group. We observed two postoperative myocardial infarctions (one in each group) and any cerebrovascular event or pulmonary embolism.

In the second study we conclude that both tranexamic acid and aprotinin significantly reduce the postoperative blood loss in OPCAB patients, and the efficacy of tranexamic acid and aprotinin, respectively, seems to be quite similar. We did not observe any statistically significant difference in the need for allogenic transfusion, although the total number of re-transfused patients was the highest in placebo group. Treated groups did not demonstrate postoperative increase in mean levels of myocardial enzymes, compared with placebo group. Significantly higher mean values of D-dimer were found in placebo group 24 h postoperatively. Tranexamic acid appears to be cost-effective alternative to aprotinin.

The aim of our third preliminary prospective randomized study was to compare rotation thromboelastography results and D-dimer levels in off-pump versus on-pump coronary surgery in order to identify the activation of fibrinolysis. A certain degree of rotation thromboelastography signs of fibrinolysis was noticed at the time on the completion of peripheral bypass anastomoses in both groups and in on-pump group these marks were quite widely, but not significantly expressed. Completely expressed rotation thromboelastography signs of hyperfibrinolysis were observed in 2 patients from on-pump group. In on-pump group also the highest geometric means of D-dimers and thus a dramatic intergroup difference were observed at the end of surgery; 24 hours later the significantly elevated D-dimer levels in both groups were equalized.

In the fourth study sixty-five patients scheduled for coronary surgery were randomized into three groups: A – conventional coronary artery bypass grafting, B – off-pump surgery, C – coronary artery bypass grafting with modified, rheoparin coated cardiopulmonary bypass with the avoidance of re-infusion of cardiotomy blood into the circuit. On the completion of peripheral bypass anastomoses, highly significant inter-group differences were found in the thromboelastographic parameter lysis of set time at 60 min of assessment ( $P=0.003$ ) and at 150 min of assessment ( $P<0.001$ ), the mean values of these parameters were significantly lower in group A as compared

with both groups B and C, which were statistically indistinguishable. Lysis on set time on the completion of peripheral bypass anastomoses -50% was detected in 12 patients (52.2%) originating from group A. At the other sampling times (preoperatively, 15 min after sternotomy, at the end of the procedures, and 24 h later) thromboelastographic parameters were similar in all groups. In group A no significant correlations between lysis on set time, postoperative blood loss and D-dimer levels were found. Based on our results, thromboelastographic signs of fibrinolysis were clearly detectable during cardiopulmonary bypass in group A, but not at any time in groups B and C.