

Summary

Heparin resistance occurs in about 20% of population. In that case, after application of a usual dose of heparin (2-3 mg/kg) ACT will not be sufficiently extended.

Aim: To determine the real incidence of heparin resistance in patients scheduled for a cardiac surgical procedure. To determine whether there is an association between preoperative treatment with heparin and the incidence of heparin resistance. Also, to establish whether there is an association between platelet count, patients' age, and heparin resistance.

Patients and methods: A total of 624 patients scheduled for on-pump surgery were included into a prospective study over a period of three years. Preoperative and intraoperative activated clotting time (ACT) values were recorded. Additionally, four factors referred to in the relevant literature as potential causes of developing heparin resistance were monitored in all patients: age ≥ 65 years, preoperative platelet count $\geq 300 \times 10^9/l$, preoperative administration of various types of heparin, antithrombin concentration $\leq 60\%$, and a combination of all. Patients were considered heparin-resistant if a heparin dose ≥ 5 mg/kg had not produced an anticoagulation response with ACT ≥ 480 s. Our data were evaluated using the test of agreement of relative frequency and the χ^2 test.

Results: In our group, heparin resistance was detected in 203 of the 624 patients (32.5%). The incidence of heparin resistance differed significantly from the anticipated 22%. Among the 624 patients, 363 (58.2%) were older than 65 years. The hypothesis of age-dependence ≥ 65 years is rejected ($p = 0.0391$) or is of borderline statistical significance. Regarding preoperative platelet count higher than $300 \times 10^9/l$, the hypothesis of independence was tested as opposed to the hypothesis of dependence. The hypothesis of independence was rejected ($p = 0.000027$). Before surgery, heparin was administered to 192 patients (30,8%). The hypothesis of dependence was tested as opposed to the alternative hypothesis of independence. The independence hypothesis was rejected ($p < 0.001$). Regarding preoperative antithrombin levels $\leq 60\%$, the hypothesis of independence was tested as opposed to the alternative hypothesis of independence. The hypothesis of independence of heparin resistance on antithrombin levels $\leq 60\%$ was rejected ($p < 0.001$).

Conclusion: Results of our study have confirmed an incidence of heparin resistance significantly higher than anticipated. Furthermore, our results have confirmed the incidence of heparin resistance to depend significantly on the tested risk factors, except for patients' age, which was of borderline statistical significance.