Platelet function in patients undergoing peripheral angioplasty

Borowski G., Nowaczynska A., Zubilewicz T.
1. Department of Vascular Surgery and Angiology, Medical University of Lublin, Poland;
2. Department of Haematology and Bone Marrow Transplantation, Medical University of Lublin, Poland.

INTRODUCTION
In spite of the use of antiplatelet drugs – acetylsalicylic acid (ASA) and Clopidogrel, some patients with peripheral artery disease (PAD) undergoing percutaneous transluminal angioplasty (PTA) develop thrombotic complications which, in turn, prove the above treatment insufficient. This phenomenon describing as aspirin resistance and Clopidogrel resistance was recognised in 5% up to 60% of population. The aim of the study was assessment of drug resistance in patients undergoing PTA, the impact of surgery on this phenomenon development, its relationship with diabetes, hypertension, smoking and changes of platelet surface antigen expression after PTA, according to applied antiplatelet therapy.

MATERIAL AND METHODS
The study included a total of 72 patients, with a group of patients taking ASA on a permanent basis (n=45) and in whom treatment was implemented after the procedure (n=27). Patients were also divided according to the antiplatelet therapy applied, either double-therapy after stent implantation (n=38), or ASA monotherapy after balloon angioplasty (n=36). Daily doses were 75 mg.

3 methods for the evaluation of the platelet function:
- IVY bleeding time,
- Cytometric evaluation of platelet surface antigen (CD62p and CD63) expression,
- Hemostasis measurement by Analyzer PFA-200® (Siemens).

RESULTS
In the PFA-200:
- 37.8% ASA resistance - before surgery (65% were tobacco smokers)
- 63% ASA resistance - after PTA and first dose of ASA
- 73.7% Clopidogrel resistance - after stenting and first dose of clopidogrel.

Significant increase of the expression of CD62p and CD63 markers after PTA were observed in all groups. According to IVY method, aspirin resistance was found in 40% of patients permanently receiving ASA.

CONCLUSIONS
1. Among patients with PAD stages IIB, III, and IV the level of laboratory ASA resistance is about 40%.
2. Smoking was found to be an additional factor affecting the development of resistance to antiplatelet drugs.
3. Undergoing PTA procedure results in an increase in resistance to antiplatelet medications.
4. As a result of PTA there is an increase in the expression of P-selectin and CD63, and hence increased activation of blood platelets which is not sufficiently prevented with these antiplatelet drugs applied in the perioperative period.
5. Double antiplatelet therapy limits blood platelet activation to a greater extent, compared to the therapy with only ASA.