Continuous clopidogrel dose modification after platelet function testing improves clinical outcome in acute coronary syndrome treated with percutaneous coronary intervention and initially determined high on-treatment platelet reactivity

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Introduction: High on-treatment platelet reactivity (HTPR) on clopidogrel correlates with adverse clinical outcomes in patients with acute coronary syndrome (ACS) treated with percutaneous coronary intervention (PCI)¹. Whether HTPR on clopidogrel is a modifiable risk factor for ischemic events is not clear. We sought to evaluate the effect of the serial clopidogrel dose tailoring after platelet function testing (PFT) on a clinical outcome of the patients with determined HTPR after successful PCI in ACS.

Patients and Methods: We screened 461 consecutive ACS patients. Exclusion criteria was present in 120 patients (continuous postinterventional glycoprotein (GP) IIb/IIIa receptor inhibitor perfusion, thrombocytopenia ($<150 \times 10^9/L$), significant renal insufficiency (creatinine $>200 \mu\text{mol/L}$), anemia ($\text{Htc} < 30\%$), hemorrhagic diathesis, concomitant chronic anticoagulation therapy and advanced age (>80 years of age). Patients without exclusion criteria (341) underwent PFT 12-24 hours following PCI. Patients with determined HTPR on

Figure 1. Flow chart of the personalized treatment with clopidogrel in the interventional group after coronary revascularization.

clopidogrel (n=87; 25.5%) were included in the study and randomized to the standard dose clopidogrel (control) group (n=44) and the interventional group (n=43). Blood samples for PFT using Multiplate® function analyzer (MEA) were drawn at day 1, 2, 3, 7, 30 and at month 2, 3, 6, 9 and 12 following PCI. The clopidogrel dose was modified at each PFT the interventional group with patients taking up to three 600 mg loading doses and a range of 75-300 mg maintenance dose of clopidogrel to achieve an optimal platelet reactivity (19-46 U) as set by the consensus statement².

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Results: Nine (20.9%) and 18 (41.8%) patients experienced either ischemic or bleeding adverse event in the interventional and control group during the 12-month follow up, respectively ($p = 0.044$). Composite ischemic events (hospitalization due to ischemia, target vessel revascularization, non-fatal myocardial infarction, stent thrombosis, stroke, cardiovascular death) were also significantly higher in the control group (16 vs 7 patients; $p = 0.034$). There was no difference in total bleeding outcomes ($p=1.000$).

Conclusion: We hypothesize that HTPR to clopidogrel is a modifiable risk factor and personalized antiplatelet therapy based on PFT might be implemented in ACS patients treated with PCI. Larger, similarly designed randomized studies are needed to confirm these results.

KEYWORDS: acute coronary syndrome, platelet reactivity, antiplatelet therapy, clinical outcome.

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Literature

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