# Genetic polymorphisms and antiplatelet effect of clopidogrel in patients with coronary artery disease

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*Objective:* Antithrombotic drugs, such as clopidogrel is prescribed to patients with aspirin therapy undergoing percutaneous coronary interventions (PCI). Large inter-individual variation in clopidogrel responses has been reported. However, mechanisms of the non-responsiveness are unclear. In this study, we evaluated correlation between genetic polymorphisms of *CYP2C19* and *P2Y12* and antiplatelet effect of clopidogrel in aspirin treated patients with coronary artery disease (CAD).

*Method and Results:* We examined ADP-induced platelet aggregation responses in 39 patients prescribed clopigdogrel, and we identified that the platelet aggregation were significantly difference between *CYP2C19* genotype groups (Kraskal-Wallis test p=0.0037). We also examined occurrence of in-stent restenosis of coronary artery within a year from starting clopidogrel in patients and identified that odds ratio of in-stent restenosis in patients with heterozygous and homozygous mutant of *CYP2C19* was higher than in patients with wild type. As for *P2Y12* polymorphism, there were no differences in platelet aggregation and in-stent restenosis.

*Conclusion:* Genetic polymorphism of *CYP2C19* decreases antiplatelet effect of clopidogrel and may cause in-stent restenosis. Since clopidogrel is a prodrug, CYP2C19 enzyme metabolize clopidogrel to active metabolite in the liver. Genetic polymorphism of *CYP2C19* influences enzyme activity, so the patients carrying *CYP2C19* mutation are prone to be clopidogrel resistance. These results suggest that genetic information of *CYP2C19* maybe reliable predictive marker for effective antiplatelet therapy.