



# CYP2C19 polymorphisms in acute coronary syndrome patients undergoing clopidogrel therapy in Zhengzhou population

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**ABSTRACT.** The goal of this study was to explore the polymorphisms of CYP2C19 (CYP2C19\*2, CYP2C19\*3) in patients with acute coronary syndrome (ACS) undergoing percutaneous coronary intervention (PCI) on clopidogrel therapy in Zhengzhou city for guidance on clinical medication and reduction in the incidence of thromboembolic events. Two hundred and thirty-four ACS patients undergoing PCI were included in the study, including 171 males (average age =  $64.13 \pm 12$  years) and 63 females (average age =  $67.86 \pm 10.20$  years). Pyrosequencing analysis detected CYP2C19\*2/\*3 genotypes, which were divided into wild-type homozygous C/C, mutant heterozygous C/T, and mutant homozygous T/T. This study further explored the relationship between CYP2C19 polymorphisms and clopidogrel resistance in ACS patients. Gene frequencies of C/C, C/T, and T/T for CYP2C19\*2 were 39.74, 50, and 10.26%, respectively, while the frequencies of C/C, C/T, and T/T for CYP2C19\*3 were 94.02, 5.55, and 0.43%, respectively. According to platelet aggregation analysis, 203 cases normally responded to

clopidogrel (86.8%) and 31 cases were clopidogrel resistant (13.2%). There was a correlation between gender and genotype distribution but none between age and genotype. In addition, patients with clopidogrel resistance were treated with ticagrelor antiplatelet therapy instead of clopidogrel, and only 1 case in all patients suffered thrombotic events during a 3-12 month follow-up. In conclusion, CYP2C19\*2/\*3 polymorphisms may be associated with clopidogrel resistance. Wild-type homozygote and single mutant heterozygote of CYP2C19\*2/\*3 can be given a normal dose of clopidogrel, while carriers with single mutant homozygote or double mutant heterozygote require ticagrelor antiplatelet therapy as an alternative.

**Key words:** Clopidogrel; Polymorphism; Coronary heart disease