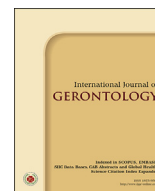




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Original Article

Thromboelastography evaluation of low response to clopidogrel in patients with acute coronary syndrome

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SUMMARY

Background: This study aims to measure platelet aggregation with thromboelastography (TEG) and observe low response to clopidogrel in patients with acute coronary syndrome (ACS) receiving dual antiplatelet therapy.

Methods: TEG was used to measure platelet aggregation in 167 hospitalized patients with ACS. Low response to clopidogrel and aspirin refer to adenosine diphosphate (ADP)-induced platelet aggregation $\geq 70\%$ and arachidonic acid (AA)-induced platelet aggregation $> 50\%$, respectively.

Results: Low response to clopidogrel was observed in 50 patients (29.9%) and 16 patients (9.6%) showed poor response to both clopidogrel and aspirin. The differences in gender, smoking history and total cholesterol (TC) on admission were statistically significant between patients with low and normal response to Clopidogrel ($P < .05$). The multivariate Logistic regression analysis showed that low response to aspirin and daily smoking 10 or less cigarettes were the risk factors of low response to Clopidogrel (the odds ratios were 1.047, $P = .000$ and 2.987, $P = .007$).

Conclusion: Partial ACS patients receiving standard antiplatelet therapy exhibited low response to clopidogrel, which was not affected by the age, combined therapy, or administration method of Clopidogrel, and the patients with low response to aspirin and daily smoking 10 or less cigarettes were more susceptible to low response to clopidogrel.

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1. Introduction

Platelet aggregation and activation play important roles in plaque rupture and thrombosis in patients with acute coronary syndrome (ACS).¹ Clopidogrel selectively inhibits the binding of adenosine diphosphate (ADP) to its platelet receptor, and the subsequent binding of fibrinogen to glycoprotein (GP) IIb/IIIa due to conformational change in GPIIb/IIIa, thereby irreversibly inhibiting platelet aggregation.² CURE³ and PCI-CURE⁴ have confirmed that the combination of clopidogrel and aspirin is more effective than aspirin alone at reducing the incidence of early and

long-term serious cardiovascular events in patients with ACS undergoing percutaneous coronary intervention (PCI). Therefore, dual antiplatelet therapy with aspirin and clopidogrel has been regarded as important treatment for ACS.^{5,6} However, according to literature at home and abroad, 4–44% of patients who receive standard dual antiplatelet treatment occurred ischemic events during their follow-up, and this phenomenon is known as the antiplatelet drug low responsiveness (ADLR).^{7–11} Currently, “cardiovascular events occurred after standardized antiplatelet therapy” is the clinical diagnostic criterion of ADLR, but this standard is not clear and cannot predict the occurrence of ADLR in advance, which can make judgments only until ischemic events occur. So, detecting the platelet function can become an ideal indicator toward ADLR. In this study, we observed the incidence of low response to clopidogrel in patients with ACS receiving dual antiplatelet therapy through detecting platelet aggregation with thromboelastography (TEG), and explored the possible contributing factors.

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Fig. 1. A flowchart for the participants' enrollment in this study.

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