



Pretreatment of Antiplatelet Therapy in ACS Patients: When and How?

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ABSTRACT

Pre-treatment antiplatelet therapy describes a strategy regarding administration of antiplatelet drugs, commonly a P2Y12 receptor inhibitor is administered prior to coronary angiography and when the coronary anatomy is unknown. Pretreatment antiplatelet therapy has shown to be beneficial in improving the outcomes of ACS patients. In STEMI cases undergoing PCI, the patient should receive DAPT (a combination aspirin and P2Y12 inhibitor) for the antiplatelet pretreatment. For NSTEMI cases, it is not recommended to administer routine pre-treatment with P2Y12 receptor inhibitor in patients in whom coronary anatomy is not known and no invasive management is not planned.

Introduction

The management of Acute Coronary Syndrome (ACS) has been a developing research issue in the recent decades nevertheless it remains a leading cause of mortality worldwide, account for approximately 5% – 8% of the cases within six months of diagnosis.¹ Pretreatment antiplatelet therapy has shown to be beneficial in improving the outcomes of ACS patients. However, several studies have shown a controversy regarding this strategy, especially in Non-ST Elevation Myocardial Infarction (NSTEMI) cases. This review paper is purposed to summarize the pretreatment antiplatelet therapy in STEMI and NSTEMI.

Discussion

Definition

Pre-treatment is defined as a strategy according to which antiplatelet drugs, usually a P2Y12 receptor inhibitor, are given prior to coronary angiography and when the coronary anatomy is unknown.² This definition encompasses a variety of different scenarios, in which pretreatment antiplatelet drugs is given at the referral hospital, in the emergency department, or even in the cath-laboratory after coronary angiography and before PCI.³

Ischemic vs Bleeding Risk

Activation of platelet aggregation and the coagulation cascade plays an important role in the acute phase of an ACS.^{4,5} This forms the basis of why it is believed that potent platelet inhibition is needed in ACS patients. Platelet inhibition using antiplatelet agent such as aspirin and P2Y12 receptor inhibitor is associated with ischemic benefit.²

On the other hand, administration of antiplatelet drugs may occur at the expenses of increased risk of bleeding.⁶ It becomes an important issue, since major bleeding events are associated with increase mortality in NSTEMI-ACS cases.⁷ To estimate the bleeding risk, scores such as CRUSADE Score or AUCITY score have been developed. Both have reasonable predictive value, with CRUSADE Score being the most discriminatory, for major bleeding in ACS patients undergoing coronary angiography.^{7,8}

Pretreatment for STEMI cases

ESC Guideline for management of acute myocardial infarction in patients presenting with ST-segment elevation (2017) set a Class IA recommendation in administration of combination of aspirin and P2Y12 inhibitor (prasugrel or ticagrelor, or if these are not available, clopidogrel may become a substitute) in patients undergoing primary PCI.⁹

The recommendation of oral dose aspirin are 150mg and 300mg and the preferred P2Y12 inhibitors dose are 60mg loading dose (prasugrel) or 180mg loading dose (ticagrelor). Prasugrel and ticagrelor are superior compared to clopidogrel because of its greater potency, more rapid onset of action, and better clinical outcomes.^{10,11} However, patients with history of stroke or transient ischemic attack are contraindicated to receive prasugrel. Age (age > 75 years), or low body weight (< 60 kg) patients will not meet the net clinical benefit while receiving prasugrel. If prasugrel is used in these patients, a reduced dose (5mg) is recommended.¹² Neither prasugrel nor ticagrelor should be used in patients with a previous hemorrhagic stroke, in patients on oral anticoagulants, or in patients with moderate-to-severe liver disease. When neither of these agents is available (or if they are

contraindicated), clopidogrel 600mg loading dose should be administered for substitute.

Pretreatment for NSTEMI cases

The new ESC Guideline (2021) recommends to give loading dose of aspirin in NSTEMI patients (Class Recommendation: IA). However, it not recommended to administer routine pre-treatment with P2Y12 receptor inhibitor in patients in whom coronary anatomy is not known (Class Recommendation: 3A). Lacking of RCTs supporting a routine pretreatment strategy using P2Y12 inhibitor might be the reason this recommendation is placed in 3A. ACCOAST Trial which enrolled 4033 patients showed that routine pre-treatment strategy using prasugrel did not reduced the rate of major ischemic events up to 30 days but increased the rate of major bleeding complications.¹⁴ Another trial, SCAAR, with 64.857 patients showed that routine pretreatment using P2Y12 inhibitor was not associated with improved clinical outcomes but was associated with increased risk of bleeding.¹⁵ ISAR-REACT 5 showed that a prasugrel-based strategy with deferred loading after knowledge of coronary anatomy in NSTEMI-ACS patients was superior to a routine ticagrelor-based strategy.

Conclusion

Pretreatment antiplatelet strategy is mandatory in ACS patient undergoing invasive management. In STEMI cases undergoing PCI, the patient should receive DAPT (a combination of aspirin and P2Y12 inhibitor) for the pretreatment. For NSTEMI cases, it is not recommended to administer routine pre-treatment with P2Y12 receptor inhibitor in patients in whom coronary anatomy is not known and no invasive management is not planned.

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