30-day outcomes of P2Y12 inhibitor pretreatment in patients with STEMI submitted to primary PCI – systematic review and meta-analysis

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Introduction: Dual antiplatelet therapy (DAPT) with aspirin and a P2Y12 inhibitor is the cornerstone of antithrombotic therapy in patients with ST-segment elevation myocardial infarction (STEMI). Yet, there is uncertainty surrounding the optimal timing for the initiation of the P2Y12 inhibitor. This study aims to evaluate the effectiveness and safety of P2Y12 pretreatment by means of a systematic review and meta-analysis of studies in primary percutaneous coronary intervention (PCI) in STEMI.

Methods: We performed a systematic search of electronic databases Pubmed, CENTRAL and Scopus until March of 2021. Studies were considered eligible if they were: a) comparing P2Y12 inhibitor upstream administration vs. treatment during PCI; b) patients enrolled for STEMI and submitted to primary PCI. Studies with patients treated with fibrinolysis or medical therapy only were excluded. Major clinical outcomes included 30-day occurrence of all-cause death, definite stent thrombosis and re-infarction. Thrombolysis in myocardial infarction (TIMI) flow-grade pre-PCI and post-PCI, in-hospital cardiogenic shock and major bleeding events were analysed.

Results: Out of 2193 articles, 18 studies were included (1 randomized clinical trial [RCT] and 17 observational studies [non-RCT]), with a total of 76,836 patients, 52,181 in the pretreatment arm. At 30 days, pretreatment was associated with a reduction in definite stent thrombosis (1 RCT & 4 Non-RCT: OR 0.40; 95% CI 0.18–0.90), but no significant reduction in all-cause death (1 RCT & 7 Non-RCT: OR 0.77; 95% CI 0.56–1.04) or re-infarction (1 RCT & 4 Non-RCT: OR 0.73; 95% CI 0.49–1.09). Regarding in-hospital outcomes, pretreatment showed a significant reduction in the occurrence of cardiogenic shock (5 Non-RCT: 0.62; 95% CI 0.51–0.79), major bleeding events (1 RCT & 14 Non-RCT: 0.83; 95% CI 0.75–0.92) and in the number of patients with TIMI flow <3 postPCI (1 RCT & 8 Non-RCT: 0.82; 95% CI 0.73–0.93). Pretreatment was not associated with lower number of patients with TIMI flow <3 pre-PCI (1 RCT & 5 Non-RCT: 0.85; 95% CI 0.66–0.90).

Conclusion: Pretreatment with DAPT, including a P2Y12 inhibitor, was associated with lower risk for definite stent thrombosis and cardiogenic shock, but was not associated with lower all-cause death or re-infarction.