Optimal antiplatelet therapy in out-hospital cardiac arrest with mild therapeutic hypothermia

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Background: Out-of-Hospital Cardiac Arrest (OHCA) and Mild therapeutic hypothermia (MTH) has been linked to an increased risk of Stent Thrombosis (ST) in comatose survivors who underwent percutaneous coronary intervention (PCI). There is no formal recommendation about which antiplatelet regimen should be used in patients with Acute Coronary Syndrome (ACS) after OHCA

Methods: Prospective, single center study.

We compared antiplatelet efficacy of clopidogrel and ticagrelor at different time points after primary PCI in OHCA patients underwent MTH with 2 systems (VerifyNow®) and light transmission aggregometry.

With the system (VerifyNow®) the results were expressed in P2Y12 reaction units (PRU) in response to ADP-prostaglandin E1.

With the aggregometry in vitro platelet aggregation was measured in response to ADP (20 lmol/L at 37 C). The main result was the percentage of maximal platelet aggregation

Results: 24 consecutive OHCA patients were included in our hospital.

We confirmed that residual platelet activity was higher with clopidogrel than with ticagrelor, expressed by PRU, 2 h after loading dose (229 ± 56 vs. 180 ± 30, $p<0.014$), 6h after loading dose during MTH (203 ± 45 vs. 135 ± 51, $p<0.004$), 24h after loading dose during MTH (188 ± 52 vs. 58 ± 64, $p<0.0001$), after warming (200 ± 55 vs. 27 ± 24, $p<0.0001$) and 24 h after warming (201 ± 57 vs. 31 ± 24, $p<0.0001$).

With the aggregometry we observed higher percentajes of maximal platelet aggregation in response to ADP with clopidogrel than ticagrelor since 6 hs after loading dose. 2 h after loading dose (44 ± 17 vs. 36 ± 23, p: 0.439), 6h after loading dose during MTH (42 ± 13 vs. 24 ± 20, $p<0.02$), 24h after loading dose during MTH (26 ± 20 vs. 9.5 ± 6.5, $p<0.005$), after warming (26 ± 16 vs. 12 ± 8, $p<0.02$)..

Conclusion: In this study, we observed a lower antiplatelet efficacy of clopidogrel compared with ticagrelor in patients with OHCA after PCI with MHT. This decrease in antiplatelet efficacy persists after the warming. Similarly to other settings, ticagrelor might be a valid alternative to clopidogrel in those patients

Figure 1: Comparison of clopidogrel and ticagrelor efficacies by P2Y12 VerifyNow® assay

Figure 2: % of maximal platelet aggregation in response to ADP