Abstract: P2708

Clopidogrel versus ticagrelor on coronary microvascular and peripheral endothelial function after non-ST elevation acute coronary syndrome: a randomised trial

Authors:
J Xu¹, S Lo¹, C Mussap¹, J French¹, R Rajaratnam¹, K Kadappu², U Premawardhana², P Nguyen², C Juergens¹, D Leung¹, ¹Liverpool Hospital, Department of Cardiology - Sydney - Australia, ²Campbelltown Hospital, Department of Cardiology - Sydney - Australia,

Citation:

Coronary Microcirculation and Collaterals

Funding Acknowledgements:
Dr. James Xu is funded by a post-graduate scholarship from the Australian Government Research Training Program (RTP)

Background: Ticagrelor has been shown to reduce microvascular injury and improve peripheral endothelial function compared to clopidogrel in ST-elevation myocardial infarction and stable patients. However, comparable data is lacking in non-ST elevation acute coronary syndromes (NSTEMI).

Purpose: To investigate the effects of clopidogrel versus ticagrelor on coronary microvascular function and peripheral endothelial function in NSTE-ACS patients.

Methods: Patients hospitalised for NSTE-ACS were prospectively randomised 1:1 to clopidogrel (300mg loading then 75mg daily) or ticagrelor (180mg loading then 90mg twice-daily). Coronary microvascular function was assessed with index of microcirculatory resistance (IMR) in the infarct related artery (IRA) and non-IRA before and after percutaneous coronary intervention (PCI) using a standard pressure-temperature coronary wire. Peripheral endothelial function was assessed with flow-mediated vasodilation (FMD) of the brachial artery, performed on admission prior to antiplatelet loading and again before discharge, using a pneumatic cuff and 10MHz linear ultrasound transducer.

Results: A total of 40 patients were included for analysis (Figure 1). Median age was 53.5 (IQR 49.0-61.5) years, 35 (87.5%) were male, 11 (27.5%) had diabetes, 19 (47.5%) were smokers. Median peak troponin T was 527 (175-1006.5) ng/L, median GRACE score 91.5 (78.3-103.3) and median SYNTAX score 13 (6-20). Baseline characteristics were similar between both groups. There was no significant difference in the median baseline IMR between the 2 groups in both the IRA (clopidogrel 14.4 [IQR 12.2-18.6] vs ticagrelor 20.8 [11.3-27.4], p=0.22) and non-IRA (14.0 [11.0-22.0] vs 14.0 [10.0-29.5] respectively, p=0.74). 28 patients underwent PCI to the IRA (12 clopidogrel, 16 ticagrelor). There was no significant difference in the median post-PCI IMR between the 2 groups (19.5 [14.5-24.5] vs 29.0 [19.0-35.6] respectively, p=0.11). However, there was significant worsening of post-PCI IMR compared with pre-PCI IMR (19.5 vs 15.0, p=0.049) in the clopidogrel group but not in the ticagrelor group (29.0 vs 25.4, p=0.47). FMD was performed in 23 patients (9 clopidogrel, 14 ticagrelor). Admission median %FMD (change in post-stimulus diameter as a percentage of the baseline diameter) was similar between the 2 groups (13.2% [10.1-17.6] vs 12.2% [10.2-15.8] respectively, p=0.41). There was a trend towards higher median pre-discharge %FMD in the ticagrelor group (12.8% [12.2-18.0]) compared to the clopidogrel group (10.4% [9.5-11.2], p=0.09). There was a trend towards lower pre-discharge %FMD compared to admission in the clopidogrel group (10.4% vs 13.2%, p=0.05) but not the ticagrelor group (12.8% vs 12.2%, p=0.43).

Conclusions: In our NSTE-ACS patients undergoing PCI, ticagrelor resulted in less disruption of coronary microvascular function and may also have beneficial effects on peripheral endothelial function compared to
Hospitalised NSTE-ACS patients planned for invasive treatment strategy

Admission FMD

Guideline directed medical therapy + randomisation 1:1 clopidogrel 300mg (then 75mg daily) vs ticagrelor 180mg (then 90mg twice-daily)

Ticagrelor (n=27)
2 withdrew consent
2 protocol violation

Clopidogrel (n=19)
2 protocol violation

Coronary physiological measurements (including IMR) before and after PCI

Ticagrelor (n=23)

Clopidogrel (n=17)

Repeat FMD prior to discharge

clopidogrel.