

Differential Effect of Ticagrelor Versus Clopidogrel on Coronary Microvascular Function in Patients with Coronary Artery Disease

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Background and Objectives: Ticagrelor is a new antiplatelet drug directly blocking P2Y₁₂-adenosine diphosphate (ADP) receptors, which show a better clinical profile compared to clopidogrel in patients with acute coronary syndrome. Ticagrelor inhibits adenosine reuptake and increases coronary blood flow by a direct dilation of the microcirculation. We aimed to evaluate the effect of ticagrelor on coronary microvascular function in patient with coronary artery disease (CAD) in comparison with clopidogrel.

Subjects and Methods: Twenty four patient with CAD were randomized to receive a single dose of ticagrelor (180 mg) or clopidogrel (300mg or on treatment state). Coronary microvascular function was invasively measured by using the index of microvascular resistance (IMR) and coronary flow reserve (CFR). The IMR was calculated from the ratio of the mean distal coronary pressure at maximal hyperemia to the inverse of mean hyperemic transit time (hTmn). The CFR was calculated dividing the hTmn by baseline mean transit time.

Results: There were no significant differences in baseline clinical and angiographic characteristics. CFR was not significantly different in both groups. (median: 4.00 [interquartile range(IQR) 2.30 to 4.92] vs 5.10 [IQR: 3.72 to 7.90], p= 0.24) However, IMR was significantly lower in ticagrelor than clopidogrel treated patients at 140 microgram/kg per minute adenosine infusion rate. (median: 10.74 [interquartile range (IQR) 8.02 to 12.31] vs 15.56 [IQR: 10.77 to 29.74], p=0.05).

Conclusions: In patients with CAD, ticagrelor might improves coronary microvascular function. These results suggest that ticagrelor could contribute to better clinical outcomes in CAD patients