**Effect of Ticagrelor on Microvascular Dysfunction in Patients with Coronary Artery Disease Including Acute Coronary Syndrome: a Systematic Review and Meta-analysis**

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**Introduction:**

Despite restoration of blood flow in patients with acute coronary syndrome (ACS) by revascularizing epicardial vessels via percutaneous coronary intervention (PCI), microvascular dysfunction (MD) still occurs in majority of patients impacting clinical and functional outcomes.

**Objective:**  We sought to perform meta-analyses on all studies that compared the use of ticagrelor to other P2Y12 inhibitors (clopidogrel and prasugrel) among varying spectrum of CAD patients. We selected studies that reported coronary physiologic measurements including index microcirculatory resistance (IMR), coronary flow reserve (CFR) and fractional flow reserve (FFR).

**Methods**: We searched PubMed, Cochrane Central Register of Clinical Trials, EMBASE and ClinicalTrial.gov (inception through July 10, 2021) for studies comparing ticagrelor with other P2Y12 inhibitors that reported various coronary physiological measurements among CAD patients. We used random-effects model to calculate standardized mean difference (SMD) with 95% confidence interval (CI). Outcomes of interest included IMR, CFR, and FFR.

**Results:** A total 4 randomized trials with 367 unique patients were included in the analysis. 70.6% were males with mean age 59.9 ± 2.14 years.

The pooled IMR in the ticagrelor group vs the clopidogrel/prasugrel group was SMD of -0.65 95% CI (-1.85, 0.56; p=0.18). The results were similar in the subgroup analyses. In regards to CFR, ticagrelor was associated with a higher CFR value with SMD of 0.43 95% CI (-0.25, 1.10; p=0.11) when compared to clopidogrel. This difference was absent when compared to the prasugrel. For the outcome of FFR, there was no significant difference between ticagrelor and either clopidogrel or prasugrel.

**Conclusion:** In this meta-analysis of small number of randomized trials, there was no difference noted in the coronary physiologic parameters in patients receiving ticagrelor vs clopidogrel or prasugrel. The data suggests that the ticagrelor compared to clopidogrel showed a signal of superiority in reducing microvascular injury, while ticagrelor compared to prasugrel had no difference. More data from larger randomized trials is needed to evaluate if one P1Y12 inhibitor is better than others in improving microvascular dysfunction.

**Key Words**: Microvascular dysfunction, IMR, FFR, CFR, P2Y12

**Figure:** Forest plot with subgroup analysis.

("Ticagrelor " OR "clopidogrel" OR "prasugrel") AND ("microvascular dysfunction" or "dysfunction")

