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Percutaneous coronary intervention versus medical therapy for coronary lesions with positive fractional flow reserve (FFR) but preserved coronary flow reserve (CFR). A substudy of the COMPARE-ACUTE

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Introduction: International guidelines recommend performing percutaneous coronary intervention (PCI) on stable coronary lesions with a positive fractional flow reserve (FFR) to improve clinical outcomes. It remains unclear if FFR positive lesions with preserved coronary flow reserved (CFR) might be better treated medically.

Purpose: This study compared clinical outcomes between PCI and medical therapy for stable FFR-positive lesions with preserved CFR.

Methods: We performed a substudy of the randomized, multicenter COMPARE-ACUTE trial in which treated ST-elevation myocardial infarction patients with stable non-culprit lesions were randomized to either FFR-guided PCI or medical therapy. Based on baseline and hyperaemic pressure gradients, we computed the so-called pressure bounded-CFR (pb-CFR) and classified lesions as low (<2) or preserved (≥2). Our primary end point was a composite of death from any cause, non-fatal myocardial infarction, revascularization, or cerebrovascular events (MACCE) at 12 months.

Results: A total of 980 lesions from 885 subjects were included in this sub-study due to availability of baseline and hyperaemic pressure gradients. For the 462 lesions with FFR≤0.80, 249 had a pb-CFR<2 while 29 had a preserved CFR (pb-CFR≥2). The rate of MACCE at 1 year did not differ significantly between subjects with FFR≤0.80 and pb-CFR<2 versus FFR≤0.80 and pb-CFR≥2 (24% vs. 30%, p=0.44). Because of randomization, baseline characteristics were well balanced between subjects with FFR≤0.80 and pb-CFR≥2 who were treated by PCI or medical therapy. Importantly for subjects with FFR≤0.80 and pb-CFR≥2, MACCE occurred more frequently when treated medically compared with PCI (50% vs. 0% respectively, p=0.01).

Conclusions: In this post-hoc substudy from a large randomized controlled trial of 885 subjects with 980 lesions, a preserved pb-CFR≥2 did not associate with an improved clinical outcome when FFR≤0.80. Subjects with FFR-positive coronary lesions but a preserved pb-CFR experienced significantly worse clinical outcomes when treated medically instead of with PCI. These data suggest that a stenosis with a FFR≤0.80, even when pb-CFR remains preserved, benefits from treatment with PCI.