Intravascular imaging associated with improved outcomes compared with angiography

August 28 2023

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Intravascular imaging-guided percutaneous coronary intervention (PCI) is associated with a lower rate of target lesion failure compared with

angiography-guided PCI, according to late breaking research presented in a Hot Line session August 27 at ESC Congress 2023.

Numerous randomized trials have compared intravascular imaging-guided PCI with angiography-guided PCI. However, most of these prior trials have used intravascular ultrasound (IVUS). Optical coherence tomography (OCT) is a newer intravascular imaging modality that has enhanced resolution compared to IVUS. During Hot Line session 4 at ESC Congress 2023, two randomized trials of OCT-guided versus angiography-guided PCI will be presented for the first time, the ILUMIEN IV trial in high-risk patients with complex lesions and the OCTOBER trial in bifurcation lesions.

The authors of the current study performed a real-time updated network meta-analysis, integrating data from the ILUMIEN IV and OCTOBER trials with prior studies, to examine the effects of intravascular imaging guidance versus angiography guidance. The analysis compared: 1) the overall effects of intravascular imaging (IVUS and OCT) in improving outcomes of the PCI procedure versus angiography; 2) IVUS versus angiography; 3) OCT versus angiography; and 4) IVUS versus OCT.

The analysis incorporated 20 randomized trials of intravascular imaging-guided PCI compared with angiography-guided PCI in 12,428 patients with chronic and acute coronary syndromes. Of those, 7,038 were randomly allocated to intravascular imaging guidance (including 3,120 patients randomized to IVUS guidance, 2,826 patients randomized to OCT guidance, and 1,092 patients randomized to IVUS or OCT guidance), and 5,390 patients were randomly allocated to angiography guidance. Patients were followed for between six months and five years.

The primary endpoint was target lesion failure, defined as a composite of cardiac death, target vessel myocardial infarction, or target lesion revascularization. Secondary endpoints included cardiac death, target

vessel myocardial infarction, target lesion revascularization, and stent thrombosis, as well as all-cause death, all myocardial infarction and target vessel revascularization.

Intravascular imaging (IVUS or OCT) guidance of PCI resulted in reductions in the primary composite outcome of target lesion failure by 31% compared with angiography guidance of PCI. Regarding secondary outcomes, intravascular imaging guidance of PCI resulted in reductions in cardiac death by 46%, target vessel myocardial infarction by 20%, target lesion revascularization by 29%, and stent thrombosis by 52% compared with angiography guidance of PCI. There were also statistically significant reductions in all-cause death, all myocardial infarction and target vessel revascularization with intravascular imaging guidance of PCI. The outcomes were similar for OCT-guided PCI and IVUS-guided PCI when compared individually against angiography and when compared to each other.

Principal investigator Dr. Gregg Stone of Icahn School of Medicine at Mount Sinai, New York, said, "The results of this network meta-analysis emphasize the importance of physicians using intravascular imaging with either OCT or IVUS to optimize stent outcomes and improve the long-term prognosis of their patients."

Provided by European Society of Cardiology