

Trends in Interventional Cardiology: What 2019 Left Promising Hopes in Interventional Cardiology Practice?

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In the end of last decade, 2019 left us with some promising trials that potentially may change our interventional practice. Among the numbers of trials and studies were published in 2019, I am going to cull some interesting clinical trials that may have changed our practice. What was ahead in 2019 for interventional cardiovascular medicine? They are modifying use of antiplatelet in acute coronary syndrome (ACS) and other conditions; new paradigms in the management of revascularization strategy; increased use of transcatheter aortic valve replacement (TAVR) and emerging of new generation stents and its effective outcomes.

Revascularization in acute coronary syndrome (ACS)

In patients with ST-segment elevation myocardial infarction (STEMI), percutaneous coronary intervention (PCI) of the culprit lesion reduces the risk of cardiovascular death or myocardial infarction. COMPLETE (Complete Revascularization with Multivessel PCI for Myocardial Infarction) Trial funded by the Canadian Institutes of Health Research has given interesting results that may change our practice in revascularization of coronary arteries. The COMPLETE trial was presented at European Society of Cardiology (ESC) Congress 2019 and studied patients presented with STEMI and multivessel disease. The study was concluded that among patients with STEMI and multivessel coronary artery disease, complete revascularization was superior to culprit-lesion-only PCI in reducing the risk of cardiovascular death or myocardial infarction, as well as the risk of cardiovascular death, myocardial infarction, or ischemia-driven revascularization [1].

Antiplatelet therapy

Another interesting trial that was conducted in Acute Coronary Syndrome (ACS) is ISAR-REACT 5 (The Intracoronary Stenting and Antithrombotic Regimen: Rapid Early Action for Coronary Treatment 5) trial. German Center for Cardiovascular Research and Deutsches Herzzentrum München supported this phase 4, multicenter, randomized, open-label trial was conducted in patients who presented with acute coronary syndromes with or without ST-segment elevation. The trial has given hope for patients who presented with acute coronary syndromes with or without ST-segment elevation, the incidence of death, myocardial infarction, or stroke was significantly lower among those who received prasugrel than among those who received ticagrelor and the incidence of major bleeding was not significantly different between the two groups [2].

When it comes to dual antiplatelet therapy (DAPT), Ticagrelor With Aspirin or Alone in High-Risk Patients After Coronary Intervention (TWILIGHT) study was one of the biggest highlights. In this double-blind trial, the trialists examined the effect of ticagrelor alone as compared with ticagrelor plus aspirin with regard to clinically relevant bleeding among patients who were at high risk for bleeding

or an ischemic event and had undergone PCI. In patients with a high risk of bleeding who had undergone PCI and three months of DAPT, ticagrelor monotherapy for 12 months, vs. ticagrelor plus aspirin, resulted in substantially less bleeding. The decrease in bleeding rates did not lead to ischemic harm over a period of one year. Given the data of TWILIGHT, in high-risk patients who had undergone PCI and were treated with ticagrelor and aspirin for 3 months, an antiplatelet strategy of continuing ticagrelor alone resulted in substantially less bleeding than ticagrelor plus aspirin, without leading to ischemic harm over a period of 1 year [3].

Stents

Type of stents and upgraded new generation the stents in PCI have been playing important role in the outcomes of primary percutaneous coronary intervention (PCI) for ST-segment elevation myocardial infarction (STEMI). We have known that newer-generation drug-eluting stents that combine ultrathin strut metallic platforms with biodegradable polymers might facilitate vascular healing and improve clinical outcomes in patients with acute myocardial infarction undergoing primary percutaneous coronary intervention (PCI). Based on this theoretical idea, BIOSTEMI (Biodegradable Polymer Sirolimus-Eluting Stents Versus Durable Polymer Everolimus-Eluting Stents in Patients With STEMI) trial was designed to patients with STEMI undergoing primary PCI were randomized to a biodegradable polymer sirolimus-eluting stent. This impressive study funded by Biotronik showed that among patients with STEMI undergoing primary PCI, the ultra-thin biodegradable polymer sirolimus-eluting stent was superior to the durable polymer everolimus-eluting stent with secondary outcomes' cardiac death of 3% with biodegradable polymer stents and 6% with durable polymer stents respectively [4].

Coronary artery bypass surgery (CABG) and percutaneous coronary intervention (PCI)

In ACS, traditional role of coronary bypass surgery for complex coronary arteries lesions should not be neglected. Thus, Evaluation of XIENCE Versus Coronary Artery Bypass Surgery for Effectiveness of Left Main Revascularization (EXCEL) trial was done by supporting of Abbott Medical Devices in Santa Clara vascular Centre, California, United States. The results of this important trial indicate that PCI with second-generation DES (Xience) is noninferior to CABG for clinical and functional outcomes at 3 years following revascularization of unprotected left main lesions. As noted earlier, repeat revascularization rates were higher with PCI. Thrombosis (stent vs. graft) rates were lower with PCI than with CABG. As expected, adverse clinical events were not uniformly distributed from a temporal standpoint between the two arms. The hazard was highest with CABG in the first 30 days and clinical outcomes were actually better with PCI up to 30 days. However, this reversed between 30 days and 3 years, such that outcomes were inferior with PCI compared with CABG beyond this time frame. This was also noted out to 5 years [5].

Valve intervention

In cardiac structural intervention, transcatheter aortic valve replacement (TAVR) provides an effective, less-invasive alternative to surgical aortic valve replacement (SAVR) for an increasing population of individuals with severe AS. In the early 2019, the results of the Placement of Aortic Transcatheter Valves 3 (PARTNER 3) and EVOLUT trials presented at American College of Cardiology 2019 (ACC.19) in New Orleans. This landmark study (PARTNER 3) involves 80 percent of the people who are currently being treated with surgery for aortic stenosis. The impressive outcome of this study is TAVR would be noninferior or comparable to surgery, and we were surprised to find an almost 50 percent reduction in the primary endpoint, from 15.1 percent in the surgical group to 8.5 percent with TAVR. Similarly, EVOLUT trial showed TAVR was statistically superior to surgery for the secondary combined endpoint of all-cause mortality or disabling stroke (0.8 vs. 2.6 percent). Patients receiving TAVR had significantly better quality of life and hemodynamics at 30 days. Given this data, TAVR is considered to be reasonable option in low risk patients [6,7].

In summary, interventional cardiology science in 2019 brought a lot of trials with the potential to change our interventional cardiology practice. This, in turn, requires that cardiovascular professionals work with policy makers and clinical practice guidelines provide recommendations applicable to patients with or at risk of developing cardiovascular disease.

Conflict of Interest

I have nothing to declare.

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