REPLY: Intravascular Ultrasound–Guided PCI

Undervalued Since its Inception

We appreciate Dr. Garcia-Garcia and colleagues for their valuable comments on our paper (1). Endeavor zotarolimus-eluting stent can be considered an "early-generation" drug-eluting stent (DES) along with first-generation DES (Cypher [Cordis, Milpitas, California] and Taxus [Boston Scientific, Natick, Massachusetts]), when classified into early-generation and new-generation according to the European Society of Cardiology/European Association of Percutaneous Cardiovascular Interventions report. However, considering that the safety of first-generation DES has been questioned because of suboptimal biocompatibility of durable polymers, and the next-generation DES were developed with the novel durable or biodegradable polymeric drug carrier systems, the Endeavor zotarolimus-eluting stent (Medtronic, Dublin, Ireland) coated with a biocompatible polymer (phosphorylcholine) may not be positioned as the same category of first-generation DES. Although the definition of "new-generation" can be confusing, in this meta-analysis, we first searched the randomized trials treated with DES and excluded 5 trials with first-generation DES.

Regarding the choice of major cardiovascular event (MACE), the impact of intravascular ultrasound (IVUS) guidance on clinical outcomes particularly of "the local coronary treatment" has already been reported in the IVUS-XPL (Impact of Intravascular Ultrasound Guidance on Outcomes of Xience Prime Stents in Long Lesions) trial, and patients with IVUS guidance had a 48% reduction in the 1-year MACE rate, primarily due to the lower risk of target lesion revascularization (TLR) (2). However, in this trial, the between-group differences in cardiac death or myocardial infarction were not different. Thus, the primary objective of this meta-analysis focused on the "hard" clinical outcomes, and the MACE, even not adding the TLR events, was lower in the IVUS-guidance group. The reduction of TLR was also confirmed in this meta-analysis.

In the IVUS-XPL trial, IVUS criteria for stent optimization were defined as a minimal lumen cross-sectional area greater than the lumen cross-sectional area at distal reference segments, and 54% (363 of 678) of patients met the criteria (2). In the RESET (REal Safety and Efficacy of 3-month dual antiplatelet Therapy following Endeavor zotarolimus-eluting stent implantation-Long)-Long substudy, 49% (126 of 256) of patients met these criteria (3). In the CTO-IVUS (Chronic Total Occlusion InterVention with drUg-eluting Stents guided by IVUS) trial, 60% (117 of 196) of patients met the following criteria: 1) minimal stent area ≥ distal reference lumen area; 2) stent area at chronic total occlusion segment ≥5 mm^2 as far as vessel area permits; and 3) complete stent apposition (4). Overall, 606 (54%) patients met the IVUS criteria among 1,130 patients who underwent IVUS in the IVUS-guided group. MACE (a composite of cardiac death, myocardial infarct, and stent thrombosis) was significantly lower in the patients who met the IVUS criteria versus those who did not meet the IVUS criteria (0% vs. 1.0%; p = 0.016).

In conclusion, IVUS-guided new-generation DES implantation was associated with favorable outcomes of "hard" MACE in long lesions or chronic total occlusions.

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