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Letters

TO THE EDITOR

The Problem of Target Vessel Revascularization as Endpoint When Coronary Anatomy Is Known

We read with great interest the paper written by Piróth et al. (1). In this substudy of the COMPARE-ACUTE (Comparison Between FFR Guided Revascularization Versus Conventional Strategy in Acute STEMI Patients With Multivessel Disease) trial, it is concluded that the value of fractional flow reserve (FFR) measured during primary angioplasty in non-infarct-related arteries with >50% visual stenosis managed conservatively has a strong impact on prognosis. This substudy and the main trial propose, as hypothesis, 2 relevant modifications in current clinical practice: 1) performing measurement of the FFR systematically during the primary angioplasty; and 2) complete revascularization of non-infarct-related arteries based on FFR value. The conclusions of the study stem from the composite endpoint of vessel-related nonfatal myocardial infarction and target vessel revascularization (TVR) at 24 months, the latter being the most frequent and determinant event (155 of 157 [98.7%] events, or 159 according to Figure 1). In our opinion, 2 issues may be considered.

First, one the one hand, TVR is a soft endpoint, highly prone to bias, especially when angiography is previously known. The authors rule out this bias, arguing that the treating cardiologist were unaware of the value of FFR in the culprit-only group. The correlation between angiogram and FFR is not perfect but exists, being more accurate in the most severe lesions (2). In patients with minor symptoms and stenosis >70% already known by the patient and the clinician, the threshold to indicate TVR might have been lower, while in those cases with similar symptoms but vessels with stenosis <70%, medical treatment might have been preferred.

Second, on the other hand, both patients and their clinicians were aware of the negative value of FFR in the complete revascularization group; hence, a lower indication of TVR in this group during follow-up may have biased the association between FFR value and events.

We would appreciate if the authors would share with us the data regarding how many lesions with an FFR value ≤0.80 had a target vessel-related nonfatal myocardial infarction, how many lesions had TVR in each group, and whether there was a significant relationship between TVR and the severity of the stenosis.

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TO THE EDITOR

Natural History of Nonculprit Plaques Following STEMI

Is the Devil in the Details?

In patients with ST-segment elevation myocardial infarction (STEMI) and multivessel disease, complete revascularization, as compared with culprit lesion-only, may reduce myocardial infarction (MI) occurrence (1), supporting the role of nonculprit plaques as drivers of atherothrombotic events (2).

In their elegant paper, Piróth et al. (3) provide insights into the natural history of medically treated

nonculprit lesions following a STEMI event from a physiological perspective. Although the adopted primary endpoint comprising cardiovascular mortality, nonculprit target vessel MI, and nonculprit target vessel revascularization is of that relevance, we found of interest the insights provided by target vessel MI events which more closely reflect the natural history of atherothrombosis. Specifically, the investigators found that among nonculprit arteries with lesions undergoing physiology assessment (i.e., all angiographically intermediate [>50%] lesions as mandated by the COMPARE-ACUTE [Comparison Between FFR Guided Revascularization Versus Conventional Strategy in Acute STEMI Patients With MVD] study protocol), those resulting in target vessel MI during follow-up had significantly lower fractional flow reserve (FFR) values as compared with those without target vessel MI (0.79 vs. 0.84; p = 0.016), generating the hypothesis of an inverse relationship between FFR values and atherothrombotic events among nonculprit angiographically intermediate lesions.

However, among 56 MI events unrelated to the infarct-related artery, 38 occurred in vessels not evaluated by FFR. In other words, 68% of nonculprit-related MI originated from mild (≤50% angiographic diameter stenosis) atherosclerotic lesions. This observation highlights once again the role of nonobstructive atherosclerosis in the pathogenesis of atherothrombotic events later after STEMI, which is likely characterized by more dynamic plaque burden activity and progression (2,4). The central role of disease-modifying medical therapy in addition to myocardial revascularization naturally ensues from this finding, along with the potential value of plaque imaging to assess burden, activity, and morphological features to accurately stratify at risk patients (2,4).

Of note, it would be of interest to know which proportion of target vessel MI during follow-up were related to physiologically significant (FFR ≤0.80) or nonsignificant nonculprit intermediate lesions at angiography. As uncertainty remains on which between an anatomy- versus a physiology-guided complete revascularization strategy following STEMI is superior to reduce atherothrombotic events (5), these data may help to shed lights on this important issue.

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REPLY: The Natural History of Nonculprit Lesions in STEMI Based on FFR

We thank Dr. López-Palop and colleagues and Dr. Gallone and colleagues for their interest in our paper (1). Dr. López-Palop and colleagues voice their concern that the treating cardiologists may have been biased in their decisions concerning target vessel (TV) revascularization (TVR) with the knowledge of the anatomic severity of non-infarct-related artery (IRA) lesions and the nonischemic fractional flow reserve (FFR) values in the FFR-guided complete revascularization arm. They argue that this may have influenced our findings.

We argue the following:

1. The COMPARE-ACUTE (Comparison Between FFR Guided Revascularization Versus Conventional Strategy in Acute STEMI Patients With MVD) trial is a strategy trial, designed to compare an FFR-guided complete revascularization treatment