



## LETTER TO THE EDITOR

### Assessment of coronary microvascular dysfunction: An integral part of risk-stratification in Takotsubo cardiomyopathy - A response



### Avaliação da disfunção coronária microvascular: uma parte integrante da estratificação de risco na miocardiopatia de Takotsubo. Resposta

Dear Editor,

We have read the article by Yalta et al. on the subject of our previously published clinical case of Takotsubo cardiomyopathy (TTC)<sup>1</sup> and we would like to highlight several important points:

Firstly, coronary slow flow (CSF) and TIMI frame count (TFC) must be analyzed with caution, despite their role as a marker of enhanced coronary microvascular resistance and its association with ischemia, arrhythmia, heart failure and even mortality.<sup>2</sup> CSF is affected by the patient's clinical features: adenosine diphosphate-induced platelet aggregation rate, smoking status, total cholesterol, hematocrit, fasting blood glucose, red cell distribution width etc.<sup>3,4</sup> Moreover, technical and physiological variables may have an impact on TFC, including injection force, nitrate administration, dye injection at the beginning of diastole or heart rate.<sup>5</sup>

Currently, hyperemic microvascular resistance (HMR) and the index of microcirculatory resistance (IMR) are the gold standard for invasive assessment of coronary microvascular dysfunction (CMD). Recent European guidelines highlight not only the role of HMR/IMR, but also coronary flow reserve (CFR), and recommend that CMD should be diagnosed by measuring CFR or minimal microcirculatory resistance (HMR or IMR).<sup>6</sup> This is why we considered physiological coronary flow studies to be more precise than CSF or TFC.

Secondly, a recently published paper reported the case of eight consecutive patients diagnosed with TTC, in whom the invasive physiological assessment of microcirculation in the left anterior descending coronary artery was obtained

using a pressure-temperature sensor-equipped wire.<sup>7</sup> Most patients had normal or borderline IMR values, however, CFR was reduced in all but two patients. This was similar to the findings of our published report. There is a lack of evidence supporting the role of invasive CFR or IMR/HMR in predicting outcome or recurrence in TTC, but the role of these indices has been clearly linked to prognosis in many other scenarios, including in ST-elevation myocardial infarction.<sup>8</sup>

Thirdly, CMD in TTC is time-dependent and microvascular damage with temporal evolution toward resolution might closely correlate with myocardial stunning recovery. In our case, catheterization was performed early and consequently, both CFR and HMR were profoundly affected, revealing severe, but probably transient microvascular dysfunction.

Our patient was treated with beta-blockers and nitroglycerin (as coronary vasodilators) to reduce left ventricular filling pressure and afterload in the absence of left ventricular outflow tract obstruction.<sup>9</sup> Nevertheless, we agree with Yalta et al. that the physiological assessment of coronary blood flow will lead us to a better understanding of TTC, enabling us to choose the correct medical treatment or even prevent recurrence. We still, however, have a long way to go until this happens.

### Conflict of interest

The authors have no conflicts of interest to declare.

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