

Letter to the Editor: Definition of moderate ischemic mitral regurgitation: it's time to speak the same language

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Sir,

Chronic ischemic mitral regurgitation (IMR) remains one of the most complex items and unresolved aspects in the management of ischemic heart disease. Functional IMR is a valve disease, characterised by apparently normal leaflets and subvalvular apparatus. It occurs in approximately 20% to 25% of patients who suffered from an acute myocardial infarction (AMI) and represents a robust independent risk factor for mortality.¹ Grigioni et al. showed that the presence of functional IMR in patients with coronary artery disease is associated with an excess of mortality rate, independent of baseline patient characteristics and degree of LV dysfunction.² Moreover, in the Grigioni paper, high mortality rate was found to be directly related to the grade of IMR, evaluated by echocardiography using quantitative methods and, specifically, the effective regurgitant orifice area value (EROA). These authors reported that patients who had an AMI and concomitant functional IMR with an EROA ≥ 20 mm² displayed a worse prognosis.^{2,3}

Nowadays, there is general agreement that patients with moderate-to-severe or severe chronic IMR should undergo mitral valve surgery at the time of coronary artery bypass grafting (CABG), while trace-to-mild IMR can probably be left untreated. However, the management of moderate IMR is still controversial.^{4–7} Indications for the surgical treatment of moderate chronic IMR were not highlighted in the AHA/ACC guidelines,⁸ while a Class IIa recommendation to adding restrictive mitral valve annuloplasty during CABG was found in the ESC guidelines.⁹ Recently, in the executive summary of the ACCF/AHA guidelines for coronary artery bypass graft surgery, the authors recommended surgical treatment of moderate IMR during CABG (Class IIa).¹⁰

Usually, the echocardiographic evaluation of IMR is performed by both semi-quantitative and quantitative methods. The PISA or the stroke volume methods have high sensibility and specificity for the quantification of MR degree. Four grades of MR can be identified (Grade I = mild, Grade II = moderate, Grade III = moderate-to-severe, Grade IV = severe). Degenerative MR is considered

severe when the regurgitant volume (RV) is ≥ 60 ml or the EROA is ≥ 40 mm². On the other hand, according to the work of Grigioni and Lancellotti, functional IMR has been defined as severe for lower values of RV (≥ 30 ml) and EROA (≥ 20 mm²).^{2,3}

Although there is wide consensus regarding the cut-off value defining the severity of functional IMR, considerable controversies have been found in the quantification of moderate IMR. So, it is mandatory to quantify this lesion well for a better understanding of its impact on clinical outcomes.

In the recent literature, though there have been progressive changes in the definition of moderate IMR, there is still confusion among authors regarding the cut-off value characterizing moderate IMR.^{4,5,11,12}

So far, a common language for defining the presence of moderate IMR has not yet been established. By doing so, this could better guide our physicians in clinical decision making. Furthermore, we need to avoid what happened in the past. Indeed, according to those previous reports (different grade of MR and different entity of the pathology), no robust conclusion can be made about the management and the clinical impact of moderate IMR. As in degenerative MR, the quantitative evaluation of IMR appears to be the gold standard method. Using the conventional colour Doppler flow mapping in the left atrium and the measurement of the regurgitant jet width to quantify IMR may be subject to errors. In

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most cases, the regurgitant jet is eccentric due to asymmetric tenting of the posterior leaflet and the size and width of the colour jet may be underestimated. Moreover, most of the patients with IMR use diuretic therapy that changes heart loading and leads to changes in colour regurgitant jet mapping into the left atrium. The quantitative method using Doppler measurement of stroke volumes or, when feasible, the analysis of the flow convergence zone using the PISA method are more accurate. It has been shown that the RV and, specifically, the EROA are less load-dependent and more reliable. Nevertheless, we must keep in mind that IMR is a dynamic lesion, depending on the hemodynamic conditions, and its severity may vary over time. The use of inotropic agents or diuretics may alter the loading conditions and can substantially modify the real entity of IMR. The chronic volume overload in a ventricle that has decreased compliance causes an increase in ventricular wall stress and in end-diastolic pressures that lead to more LV remodelling and, subsequently, worsening MR, creating a vicious circle. Furthermore, the evaluation of mild-to-moderate IMR must be performed, not only in resting conditions, but, also, under exercise testing.¹³ This helps us to a better understanding of the entity of the lesion and its impact on symptoms, leading to exact treatment choice.

In our recent study, we evaluated the impact of moderate IMR (EROA = 10-19 mm²) on the clinical outcomes of patients undergoing isolated CABG.¹⁴ The 5-year free from all deaths and cardiac-related deaths among patients without IMR versus with IMR were, respectively, 90.5% ± 1.8% versus 73.7% ± 2.1% ($p < 0.001$) and 94.2% ± 1.6% versus 79.5% ± 1.5% ($p < 0.001$). Therefore, patients with IMR and EROA = 10-19 mm² had a worse prognosis and a higher 5-year mortality and morbidity compared with those without any grade of IMR who underwent isolated CABG.

In our opinion, there is an urgent need to homogenize the definition of moderate IMR, with the goal of a better understanding of this clinical entity. Two points of view may be considered. The first one, a new scaled-grade will be used for IMR (Mild: EROA <10 mm², Moderate: EROA = 10-19 mm², Severe: EROA ≥20 mm²). The second point of view is to keep the existing definitions, which are based on physiological measurements (i.e. an EROA of 20-40 is moderate and an EROA >40 is severe) and recognize, instead, that moderate functional ischaemic MR has an adverse prognosis and mitral valve intervention should also be considered in these patients. The analogy to this is in the case of tricuspid regurgitation (TR) where it is accepted that moderate functional TR in the presence of tricuspid annular dilatation is a surgical indication. The definition of moderate TR has not been changed to severe (as has been suggested for ischaemic

MR), but, instead, the recommendation is for surgical intervention in moderate TR.

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Conflict of interest statement

The authors have no conflicts of interest to declare

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