LETTERS TO THE EDITOR

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Geometry or function for the prediction of prognosis following revascularization in ischaemic cardiomyopathy: beyond the ejection fraction

I read with great interest the recent article in the Journal by Joshi et al., regarding the prognostic value of improvement in ejection fraction (EF) following revascularization in patients with ischaemic cardiomyopathy (ICM). I wish to raise some points for consideration.

Previous studies have shown the importance of the degree of left ventricular (LV) geometry and LV remodelling, both on the ability to recover global function and to inform prognosis. Schinkel et al. found that, in 118 ICM patients assessed before and after revascularization, patients with significant myocardial viability but in whom EF did not improve had significantly larger left ventricular end-systolic volumes (LVESV) than those in whom EF improvement was seen. ROC curve analysis indicated that an initial LVESV ≥140 mL accurately predicted lack of recovery of function. The same group later published data showing that this negatively affects outcome—indeed, they showed that patients with small ventricles and no viability had a lower event rate during follow-up (24%) than those with large ventricles and viable myocardium (38%). These findings were in keeping with those previously reported by Senior et al., who found that in 70 ICM patients followed up for a mean of 3.5 years, the only multivariate predictor of survival patients was baseline LVESV irrespective of whether patients were managed medically or revascularized. It is now believed that severely dilated ventricles—which have undergone severe remodelling—are unable to improve in function following revascularization, irrespective of the quantity of hibernating myocardium.

Given this background, it is notable that in the study by Joshi et al., there was a strong trend towards larger cavity size in those who died vs. the survivors (152 vs. 123 mL) and this gave a very borderline P-value of 0.052. The authors do not mention this difference between their groups or comment on the importance of LV geometry in their paper. The authors do not inform us of the change in LVESV at follow-up echocardiography and whether the change in LVESV was entered into their multivariate regression model. It would have been interesting to know how change in LVESV was related to change in EF following revascularization in their particular patient cohort.

Additionally, certain methodological issues warrant attention. First, over one-quarter (25.3%) of patients were incompletely revascularized. The authors do not comment on whether incomplete revascularization was accounted for in their analysis—those LV segments not revascularized may not be expected to improve in function and usually would then be excluded from the analysis. As this was a retrospective study, the timing of follow-up echocardiography was not in the hands of the authors—however, it should be acknowledged that this was performed at a mean of just 4.8 months after surgery. Previous work has shown that functional recovery can take significantly longer than this, given that there appear to be an admixture of varying degrees of stunned and hibernating myocardium in such patients. Consequently, it is possible that, had echocardiography been performed at 9 or 12 months following revascularization, a larger proportion of hibernating myocardium would have been identified.

In conclusion, Joshi et al. should be commended for contributing further to the evidence base in the field of ICM. However, it is surprising they have not discussed the importance of LV geometry in these patients—both on ability to predict functional recovery and predict prognosis—and not reported how ventricular geometry changed following revascularization. The current evidence base strongly suggests that LV geometry, over and above the EF, plays a critical role in determining outcome in ICM patients.

Conflicts of interest: none declared.

References

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We appreciate the insightful comments of Shah regarding geometry and function for prognostic assessment in ischaemic cardiomyopathy. We agree with him about the prognostic importance of end-systolic volume (ESV). As Shah points out, in our investigation, there was a trend towards larger base-line ESV before revascularization in patients with cardiac death (P = 0.052). For the purposes of responding to Shah’s query, we assessed the prognostic value of ESV following revascularization. Larger ESV on follow-up...