Cardiac Rehabilitation in Heart Failure: Looking Further Ahead

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ABSTRACT

Heart failure (HF) is associated with significant morbidity and mortality. Despite major advances in the treatment of HF, there are still important unmet needs among this patient population. Cardiac rehabilitation has a central role in cardiovascular prevention and for overall disease management, and can have an important impact among HF patients. The authors present a brief overview on the current role of cardiac rehabilitation among HF patients in a contemporary setting and discuss some areas of future research in the context of this intervention.

INTRODUCTION

Cardiac rehabilitation (CR) programmes play a pivotal role in the cardiovascular continuum, being of paramount importance in the management of several pathological processes.[1-3] Exercise, one of the pillars of this intervention, can have profound interactions with the cardiovascular system.[2,4] Additionally, contemporary CR programmes have evolved into comprehensive frameworks designed to provide an integrative approach to the individual patient, encompassing not only exercise training, but several other interventions on a multidisciplinary setting.[1,5] Over the last few decades, a wealth of data have shown the beneficial effects of CR, on both outcomes, such as mortality, and different measures of functional capacity and quality of life, especially in individuals with coronary heart disease,[2,3,6,7] attesting to its relevance.

MAIN BODY

Heart failure (HF) presents a major and growing challenge, having an important prevalence among several world regions and being associated with substantial morbidity, mortality, and healthcare costs.[8,9] Whilst there have been significant improvements in the management of this syndrome, in regards to pharmacological and device-based treatments there are still important unmet needs in this patient population.[8,10]

Importantly, and especially for HF with a preserved ejection fraction, this syndrome can also be associated with several changes affecting the musculoskeletal, respiratory, and peripheral vascular systems; therefore, exercise training could be particularly pertinent.[2,10,11] In addition, the ample scope of CR also makes this intervention attractive given the overall clustering of cardiovascular risk that can be present in these individuals.[1,2,5,8] As such, there has been considerable interest in the role of CR programmes among HF patients.[8,12,13]

In this regard, several studies have been designed to assess the potential impact of CR programmes.[14-16] Importantly, data on this matter should be reviewed while taking into consideration both study designs and the protean nature of this entity (as expressed by patient and programme characteristics). The HF-ACTION trial, including 2,331 patients with HF and a reduced ejection fraction, showed that an exercise training programme, although safe, was not associated with a significant reduction in all-cause mortality or hospitalisations.[17] However, when adjusting for highly prognostic covariates, including cardiopulmonary exercise test duration, left ventricular ejection fraction, history of atrial fibrillation/flutter, Beck Depression Inventory II score, and HF aetiology, there were significant reductions on all-cause mortality or hospitalisations.[17] Remarkably, and as previously discussed, these data should take possible limitations relating to the patient population studied, the design of the programme, background therapy, and the blinding status into consideration.[17,18] Indeed, the type of exercise training modality should be highlighted, as this can lead to discrepant results in terms of different CR programmes.[19] In this regard, though high-intensity interval training has shown promising results,[19,20] a recent multicentre study (the SMARTEX Heart Failure Study) compared the effects of a supervised programme of high-intensity interval training or moderate continuous training among patients with HF and a reduced ejection fraction, and this study did not show significant differences in terms of aerobic capacity or left ventricular remodelling.[21] However, before generalisation of results, it should be mentioned that the differences in training intensity between groups partly overlapped (being less than intended).[21] Additionally, in HF with a preserved ejection fraction, a pilot study appeared promising for high-intensity interval training in terms of both peak oxygen consumption and diastolic function parameters.[22] Interestingly, and showcasing the multisystemic nature of the HF syndrome, other modalities of exercise training such as those relating to the inspiratory muscles seem of potential relevance.[23] Given the present data, further research appears justified in order to ascertain the optimal strategy for HF patients with a reduced, as well as preserved, ejection fraction.[13,22,24]

Another issue worth mentioning relates to the timing of the CR intervention.[12,25] A recent Cochrane review showed that in the context of HF, CR can be of importance in the reduction of hospitalisations, as well as providing improvements in quality of life.[14] In the present meta-analysis, the authors reported no reduction in mortality, but an improvement could be present in long-term interventions.[14] This notion was previously described in the seminal study by Belardinelli et al.,[25] in which a 10-year CR programme among HF patients (with an ejection fraction <40% at baseline) was associated with significant improvements in terms of functional capacity, left ventricular ejection fraction, and cardiac mortality. The most recent Cochrane meta-analysis also reported improvements on quality of life measures,[14] a finding which has also been recently reported in an article by Taylor et al.[15] in the context of the ExTraMATCH II collaboration. Additionally, the latter analysis, which addressed individual patient data from 13 trials, encompassing a total of 3,990 patients, also reported significant improvements in exercise capacity.[15] Though these results should be interpreted in light of possible biases, as elegantly discussed by the authors and featured in the comparison of the results for the effect on mortality and hospitalisations with the Cochrane review, they reinforce the prominent role of CR among HF patients.[12,14,16,26,27] Notably, it should be stressed that despite the present data, CR uptake remains a challenge,[1,28] especially among older individuals, female patients, and those with more comorbidities.[28] As such, strategies to improve patient participation, specifically in these subgroups, are an area of growing clinical importance.[1,28]

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New data aiming to ascertain the role of CR programmes among less-studied groups of patients are also emerging. Although data is limited, a recent position paper by the Heart Failure Association (HFA) of the European Society of Cardiology (ESC), described that in patients with left ventricular assist devices, CR appears a promising therapy.[29,30] Future research should allow further refinements on the impact of this intervention among left ventricular assist devices recipients.[30,31] Another rapidly expanding area of investigation concerns the possible role of exercise and CR programmes in the mitigation of cardiotoxicity associated with cancer treatments.[32] Again, preliminary data showed this strategy to be feasible,[33-35] with a recent study showing that a supervised exercise programme was able to attenuate functional decline during anthracycline chemotherapy among women with early stage breast cancer.[33] Larger studies are needed to address the potential impact of this approach, namely in terms of overall mortality and morbidity, as well as the optimal timing and programme duration.[35]

CONCLUSION

Given the present data and the growing complexity associated with HF, the role of CR remains of ample significance, as highlighted in the Class I recommendation for these programmes by the ESC.[1] As contemporary patient care evolves into an era of evermore personalised medicine, the broad scope of this time-tested intervention remains central in order to provide a holistic approach to this challenging patient population.

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