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Commentary

Physical activity, exercise and fitness for prevention and treatment of heart failure

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Substantial evidence supports the importance of physical activity (PA), exercise training, and cardiorespiratory fitness (CRF) in the prevention and treatment of most cardiovascular diseases (CVD), including heart failure (HF) [1,2]. Low levels of PA/CRF, as well as higher body mass indices (BMI) and obesity, are probably even more related with HF with preserved ejection fraction (EF; HFpEF) than with HF with reduced EF (HFrEF) [1]. Among patients with established HF, at least those with chronic stable HFrEF, in the United States (US), cardiac rehabilitation (CR) is a class I recommended PA intervention that irrefutably reduces the risk of subsequent hospitalizations, adverse events, and morbidity/mortality, but unfortunately very few eligible patients are attending much less completing these formal CR programs for CVD, much less HF. Although the evidence also strongly supports the benefits of PA, exercise and higher muscular and cardiorespiratory fitness for HFpEF as well as HFrEF, CR is not currently an insurance covered indication in the US for HFpEF as it is for HFrEF [2].

In this Issue of American Heart Journal Plus, Izawa and colleagues [3] in a study from Japan assessed PA levels in 276 chronic HF patients and evaluated the relationship between PA and health utility (HU) to HF disease severity based on the NYHA Functional Classification. Their results demonstrated that higher steps per day and total PA energy expenditure (PAEE), as well as HU, all decreased significantly with HF severity. This Japanese cohort, however, was relatively lean (mean BMI 23–24 range), much more so than most HF patients in the US who would have a BMI in the upper 20s to low to mid 30s and higher, with reduced EF (average in the mid 30s), so PA may be even more important in heavier patients and those with higher EF. Also, although these results cannot determine causation versus association, these data, nevertheless, support the importance of PA for the prevention and treatment of HF.

In patients with established HF, CR has the potential to improve psychological profiles, quality of life, CRF, and major CVD morbidity

and mortality and prevent re-hospitalizations [2]. Previous studies have demonstrated significant increases in PA in CR days, but supplementation of CR attendance with pedometers may provide real time PA feedback and has been shown to enhance the volume of PA accumulated over a week, which should improve CRF and prognosis [4]. Pedometers, which are relatively inexpensive and easy to use, are a great tool to track PA and also to motivate people to obtain adequate amounts of PA. In this Japanese HF population, higher PA (steps per day) and total PAEE was associated with less severe HF and lower NYHA Functional Classification. Certainly, the American Association of Cardiovascular and Pulmonary Rehabilitation have emphasized the importance of progressive exercise volumes, which include the use of high-intensity exercise training, to improve outcomes in CR Programs, including those for HF. In patients with HF, higher compliance with PA and exercise training was associated with higher CRF levels and considerably better clinical outcomes compared to those with less compliance with PA /exercise training.

The major limitations of CR for CVD in general and maybe more so for HF is poor attendance and completion of these programs [2]. In the future, this may be better accomplished with tele-medicine and remote – and home-based CR programs [5], as well as use of pedometers, accelerometers, smart phones, etc. Clearly, standard CR has not worked well in the past and is likely to be less effective in the future, so efforts are needed to re-invent and invigorate PA and CR efforts in CVD and HF.

Finally, we applaud these authors of this study from Japan for further illustrating the importance of PA and PAEE and HU in HF severity [3]. HF is complex disease that presents many challenges to patients, thus caring for patients with HF requires a team approach. CR programs are ideally suited to support patients with HF to improve their quality of life, with a major emphasis on participation in increased levels of PA and exercise which results in improved CRF. Clearly, increased levels of PA,

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exercise, and CRF will go a long way for the prevention and treatment of most CVD, including HF. Greater efforts are needed to promote PA, exercise and CRF from youth to adulthood and throughout the health-care systems for the long-term primary prevention of HF and the promotion of PA, exercise, CRF and, specifically, CR for the secondary prevention of HF.

Disclosures

Dr. Lavie serves as a Speaker and Consultant for Personalized Activity Intelligence and the PAI Applications.

CRediT authorship contribution statement

Lavie CJ: Conceptualization, Methodology, Writing-Original draft preparation, Editing, and Supervision.

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Kaminsky LA: Conceptualization, Methodology, Writing-Original draft preparation, and Editing.

Declaration of competing interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

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