



Research Letter

Changes in derived measures from six-minute walk distance following home-based exercise training in congestive heart failure: A preliminary report[☆]



A B S T R A C T

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The response of derived parameters from six-minute walk distance (6MWD), like 6MW work (6MWW), to exercise training and its correlation with quality of life (QoL) in congestive heart failure (CHF) is not known. A secondary analysis from a randomized controlled trial on 30 patients (23 males; mean age 57.7 ± 10.4 years; mean ejection fraction $31 \pm 10\%$) with CHF in NYHA class I–IV who completed an eight-week home-based exercise training program found a significant improvement in 6MWW ($p < 0.05$), with similar correlations between 6MWD and 6MWW with QoL. 6MWW does not appear to provide additional benefit to 6MWD in cardiac rehabilitation for CHF.

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To the Editor,

Congestive heart failure (CHF) results in severe limitations in function, as a result of a complex interplay of various physiological systems.¹ Evaluation of exercise capacity has always relied upon the use of cardiopulmonary exercise testing (CPX) as the gold standard; however, this poses financial limitations in developing countries.² An alternate method is the use of the simple, inexpensive, six-minute walk test (6MWT). However, despite its ease of use, it does have limitations. One way to overcome them is

through the use of six-minute walk work, 6MWW (i.e., body weight \times distance walked), which considers the weight of the body and the force required to move this body to reduce the source of variation from $r = 0.58$ to $r = 0.81$.^{3,4}

Since, the role of 6MWW has not been explored in patients with CHF, this preliminary study, through a secondary analysis of data, assessed the effects of a home-based exercise program on the 6MWW in patients with CHF and its correlation with quality of life.

This was a secondary analysis of a randomized controlled trial, which assessed the effects of an eight-week home-based exercise

Table 1

Demographic details and changes in six-minute walk test of participants enrolled.

	Experimental (n = 15)		Control (n = 15)	
Age	56.87 \pm 10.45		58.73 \pm 10.81	
Sex (male:female)	13:3		10:5	
NYHA, median (IQR)	4 (4,3)		4 (4,3)	
Ejection fraction, mean \pm SD	30 \pm 8.8		31 \pm 12.5	
Causes for HF				
Previous MI	12		11	
Hypertension	3		4	
Medications				
Diuretics	15		15	
Digoxin	9		8	
ACE inhibitors	12		12	
SF-36 (PCS), median (IQR)	33.8 (41.2,28.5)		32.3 (44.35,29.7)	
SF-36 (MCS), median (IQR)	33.4 (37.5,29)		33.2 (36.95,21.8)	
	Discharge	Follow-up	Discharge	Follow-up
6MWD ^{a,b}	423.7 \pm 128.1	514.1 \pm 134.9	296.4 \pm 123.6	349.1 \pm 142.5
6MWW ^{a,b}	25,688 \pm 8639	31,272 \pm 9555	15,414 \pm 6905	18,081 \pm 8228

^a $p < 0.05$ between groups.

^b $p < 0.05$ within groups.

[☆] Disclosures: This was presented as a poster and adjudged the best poster at the National Update in Cardiology at Manipal, Karnataka, India (November 2012).

program on functional capacity and quality of life.⁵ The trial involved baseline assessments of functional capacity using the 6MWD and quality of life using the Medical Outcomes Survey – short form 36 (SF36). Ethical approval was obtained and participants provided written informed consent prior to participation in this study. Baseline evaluations and follow-up evaluations of 6MWD and QoL were performed through a nonblinded method. The experimental group received a structured home-based exercise program, while the control group received physician-directed advice on physical activity/exercise. Patients were followed up weekly by telephone and reviewed at the end of eight weeks with the exercise logs for final evaluation.

A total of 30 patients meeting the inclusion criteria were recruited into this trial. Further details on the flow of participants according to the CONSORT have already been described in a previous publication.⁵ The demographic details of the participants and the changes observed following home-based exercise training are given in Table 1. Correlations between 6MWD and 6MWW with both the components of the SF36 showed moderate correlation at discharge. However, at follow-up, both the 6MWT and 6MWW show good correlation with the physical component of the SF36 ($r = 0.882$; $p < 0.001$ and $r = 0.801$; $p < 0.001$).

This preliminary work suggests there is no additional benefit of using 6MWW, even though it better represents the work of walking than the 6MWD alone.³ The good correlations with QoL, especially the PCS component of SF36, suggest that the 6MWW is as good as the 6MWT, when tested against each other. In addition, both the derived variables of the 6MWT showed a good response to exercise training as well. However, this could also be due to the inclusion of the 6MWD in these derived measures. Therefore, there may not be an additional benefit to the use of 6MWW over the 6MWD in cardiac rehabilitation for CHF.

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Conflicts of interest

The authors have none to declare.

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