Impact of exercise training modalities on changes in quality of life during cardiac rehabilitation

Dominique Hansen[1,2], Gitte Hooyberghs[1], Amélie Smolders[1], Frank Vandereyt[2]

[1]REVAL–Rehabilitation Research Center (BIOMED), Faculty of Medicine and Life Sciences, Hasselt University, Diepenbeek, Belgium; [2]Jessa Hospital, Heart Centre Hasselt, Hasselt, Belgium

INTRODUCTION

Patients with coronary artery disease (CAD) and congestive heart failure (CHF) experience reductions in exercise and functional capacity, which adversely affects the health-related quality of life (QoL).

Exercise intervention (as part of multidisciplinary rehabilitation) positive affects QOL in these patients, but it remains unknown whether the selection of specific exercise training modalities leads to greater improvements in QOL.

AIM

To evaluate the impact of different exercise training modalities on changes in QOL in CAD and CHF patients during rehabilitation intervention.

METHODS

Cross-sectionally (in part 1) 291 CAD and CHF patients were studied (226 males, mean age 63±11 years) for independent relations between QOL (by HeartQol) and physical fitness (measured by ergospirometry testing), CVD risk profile and subject characteristics.

Next, 125 patients completed a supervised cardiac rehabilitation intervention (in part 2) (program duration 16±4 weeks, 36±6 exercise sessions, session duration of 43±2 min at 57±23 % of peak cycling power output, strength training was applied in 7±13 sessions), in which at entry and completion of this intervention QoL, HADS and physical fitness was assessed.

Relations between (changes in) these variables were assessed in both studies by multivariate linear regression analyses.

RESULTS

In part 1, total QoL score was significantly elevated in patients with a higher peak oxygen uptake and age at entry of rehabilitation, underwent a PCI and did not take nitrates (n=291, p>0.05) (see Table 1). No other significant independent relations were observed. Total HADS score was significantly lower in patients with a higher peak cycling power output and age at entry of rehabilitation, underwent a endo-ACAB and did not take nitrates (n=291, p>0.05). No other significant independent relations were observed.

In part 2, as result of intervention significant improvements were observed in total HeartQol score (from 30.2±7.6 to 34.4±6.3), HADS score (from 9.6±6.4 to 8.1±6.6) and peak cycling power output (142±46 to 167±53 W) (p<0.05). However, the change in QOL total score or any subscore did not correlate with the selection of specific exercise training modalities (p>0.05), but greater improvements were noticed in patients experiencing greater changes in physical fitness, taking nitrates or having underwent CABG surgery (n=125, p<0.05) (see Table 2).

Table 1 Multivariate regression analysis to explain quality of life, anxiety and depression at entry of rehabilitation

	HADS anxiety	HADS depression	HADS total	HeartQoL physical	HeartQoL emotional	HeartQoL total
Model r²	0.049	0.057	0.060	0.178	0.038	0.154
Significant relations (p<0.05)	Peak cycling power output	Nitrate intake	Underwent endo-acab	Underwent PCI	Peak cycling power output	Nitrate intake
	(-)	(+)	(-)	(+)	(+)	(-)
	Age	VO2peak (ml/kg/min)	Nitrate intake	VO2peak (ml/kg/min)	Age	VO2peak (ml/kg/min)
	(-)	(-)	(+)	(+)	(+)	(+)
			Age			Underwent PCI
			(-)			(+)
			Peak cycling power output			Age
			(-)			(+)

+ indicates a positive relation, - indicates a negative relation

Table 2 Multivariate regression analysis to explain changes in quality of life, anxiety and depression during rehabilitation

Change in	HADS anxiety	HADS depression	HADS total	HeartQoL physical	HeartQoL emotional	HeartQoL total
Model r²	0.113	0.181	0.097	0.25	0.08	0.255
Significant relations (p<0.05)	Presence of diabetes	Nitrate intake	ΔBlood pressure	Underwent PCI	Presence of diabetes	Nitrate intake
	(-)	(-)	(+)	(-)	(+)	(+)
	Age	Exercise sessions	Presence of diabetes	Nitrate intake	Underwent CABG	Underwent CABG
	(-)	(-)	(-)	(+)	(+)	(+)
				ΔPeak cycling power output		ΔPeak cycling power output
				(+)		(+)

+ indicates a positive relation, - indicates a negative relation, Δ indicates change over time

CONCLUSION

Exercise-based cardiac rehabilitation leads to significant improvements in the quality of life in patients with CAD and CHF.

The selection of different exercise training modalities did not affect the change in the quality of life, although changes in physical fitness were independently related to changes in quality of life.

To optimize quality of life in these patients improvements in physical fitness should thus be strived for.

Declaration of interest

The authors declare that there is no conflict of interest associated with this publication

Contact: dominique.hansen@uhasselt.be