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Home-based cardiac rehabilitation is as effective as centre-based cardiac rehabilitation among elderly with coronary heart disease: results from a randomised clinical trial

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Abstract

Background: participation in centre-based cardiac rehabilitation (CR) is known to reduce morbidity and mortality but participation rates among the elderly are low. Establishing alternative programmes is important, and home-based CR is the predominant alternative. However, no studies have investigated the effect of home-based CR among a group of elderly patients with coronary heart disease with a long-term follow-up.

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Methods: randomised clinical trial comparing home-based CR with comprehensive centre-based CR among patients ≥65 years with coronary heart disease.
Results: seventy-five patients participated. There were no significant differences in exercise capacity after the intervention between home and centre-based CR. Adjusted mean differences of peak VO_2 = 0.9 ml/kg/min (95% CI −0.7, 2.4) and of 6 min walk test = −18.7 m (95% CI −56.4, 18.9). In addition, no differences were found in the secondary outcomes of systolic blood pressure (−0.6 mmHg, 95% CI −11.3, 10.0), LDL cholesterol (0.3 mmol/l, 95% CI −0.04, 0.7), HDL cholesterol (0.2 mmol/l, 95% CI −0.01, 0.3), body composition, proportion of smokers and health-related quality of life. A group of patients who did not have an effect of either programmes were characterised by higher age, living alone and having COPD. At 12 months of follow-up, both groups had a significant decline in exercise capacity.
Conclusions: home-based CR is as effective as centre-based CR in improving exercise capacity, risk factor control and health-related quality of life. However, a group of patients did not improve regardless of the type of intervention. Continued follow-up is essential in order to maintain the gained improvements.

Keywords: *cardiac rehabilitation, elderly, physical activity, coronary heart disease, heart failure*

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Introduction

Participation in cardiac rehabilitation (CR) is known to reduce mortality and morbidity and increase health-related quality of life [1–3]. Rehabilitation programmes are often located at centres (hospitals), which make it difficult for some patients to participate. Especially older age and high co-morbidity are strong predictors for non-attendance [4]. Reviews and meta-analyses have documented the effect of centre-based rehabilitation also among the elderly (≥65 years) with coronary heart disease [5, 6], and since this group of patients is the fastest growing subgroup of cardiac patients, it is important to adapt the programmes according to their demands.

A suggested alternative to centre-based CR is home-based CR where the entire programme or part of this is moved from the centre to the patients' home. These programmes seem ideal in targeting the elderly patients, but have primarily been implemented in English-speaking countries. A recently published Cochrane meta-analysis [7] found that home-based CR programmes were not inferior to centre-based programmes. However, the populations were highly selected with under-representation of the elderly and patients with high co-morbidity and congestive heart failure were excluded.

The aim of this study is to compare home-based CR with centre-based CR among elderly patients ≥ age 65 years with coronary heart disease in a randomised design with 1-year follow-up.

This report follows the CONSORT guidelines [8].

Methods

Trial design

The study is a randomised clinical trial comparing home-based CR with centre-based comprehensive CR. Patients who declined participation in the study were offered the centre-based programme. The study population consisted of patients ≥65 years with a 'new' event of coronary heart disease defined as acute myocardial infarction (MI), percutaneous transluminal coronary intervention (PCI) or coronary artery bypass graft (CABG). Exclusion criteria were mental disorders (dementia), social disorders (severe alcoholism and drug abuse), living at nursing home, language barriers and the use of wheelchair.

Patients were recruited either from a database covering all invasive procedures in the catchment area of Bispebjerg University Hospital or from the Coronary Department. The recruitment period was from January 2007 to July 2008.

Patients were randomised in alternate block sizes of four to six using computer-generated randomly permuted blocks. Because of the nature of CR, the result of the randomisation could not be blinded and was therefore open to the investigator, involved health personnel and patients. Data were obtained at baseline and after 3, 6 and 12 months. The patients had to give informed consent before any trial-related procedures.

The study was approved by the local ethic committee (jr. nr. KF01327990), the Danish Data Protection Agency (jr. nr. 2006-41-7212) and is registered at www.clinicaltrial.gov (NCT00489801).

Interventions

The home programme

The home programme was designed to focus on the exercise component of CR, which was moved to the patients' home. A physiotherapist made home visits twice with 6 weeks interval in order to develop a training programme that could be performed at home and in the surrounding outdoor area. The physiotherapist made a telephone call in between the two visits to clarify any questions.

In order to prescribe adequate exercise programmes, a 6 min walk test (6MWT) and a maximal symptom-limited

exercise capacity test on bicycle ergometer measuring peak oxygen uptake (peak VO_2) were conducted.

The exercise programmes were individualised but followed international recommendations [9] with 30 min exercise per day at a frequency of 6 days a week and an intensity of 11–13 on a Borg scale [9]. The main types of exercise recommended were self-passed brisk walking and stationary bicycling.

All patients were offered dietary counselling and (if needed) smoking cessation.

The centre programme

This consisted of a 6-week intensive programme where patients were offered group-based supervised exercise training 60 min twice a week and were encouraged to exercise at home in order to comply with the international recommendations. As for the home programme, a physiotherapist individually tailored the exercise programmes. In addition, patients were offered six education lectures, two dietary counsellings, three practical cooking classes and (if needed) smoking cessation counselling. The programme has been published in detail elsewhere [10].

Regarding risk factor intervention and medical adjustment, a cardiologist counselled the patients both at home and in the centre intervention at baseline and after 3, 6 and 12 months. At 4 and 5 months, a telephone call was made to answer any questions. The pharmacological treatment followed international guidelines [11] and were thus identical in the two groups. When both the home and centre intervention ceased at 3 months both groups were encouraged to continue to exercise 30 min 6 days a week at an intensity of 11–13 on a Borg scale.

Outcome measures

Primary outcome was changes in exercise capacity determined by peak VO_2 and 6MWT.

Peak VO_2 was obtained by a symptom-limited exercise capacity test performed on an electrically braked cycle ergometer (ER900, Jaeger, Würzburg, Germany) with concomitant expired gas analysis using a facemask with breath-to-breath technique (Oxycon Pro System, Jaeger). The protocol started at 25 W increasing with 10 W every minute. The outcome measurements were obtained according to guidelines on cardiopulmonary exercise testing [12, 13], and gas analyses were thus registered as a mean every 15 s throughout the test. Peak VO_2 was defined as the highest mean value measured within the final minute of exercise. O_2 pulse was calculated as peak VO_2 divided by the corresponding maximal heart rate. The gas exchange ratio (RER) was calculated as VCO_2/VO_2. The VE/VCO_2 slope was estimated using all points obtained under the exercise test. Anaerobic threshold was estimated by the V-slope method [14] and automatically calculated.

The secondary endpoints were: sit to stand test (STS), self-reported level of activity (using a four-category self-administered questionnaire) [15], systolic and diastolic blood pressure, total, HDL and LDL cholesterol, body mass index (BMI), waist–hip ratio, proportion of smokers and health-related quality of life estimated by SF-12 and Hospital Anxiety and Depression Scale (HADS).

Co-morbidity was assessed by the Charlson co-morbidity index (CMI) [16], which measures the burden of 19 co-morbid conditions and takes into account both the number and the severity of each condition through a weighted index.

Power calculations

The calculation of sample size is based on an expected minimum increase in peak VO_2 of 15%, since this difference is found to be of clinical importance [17]. In comparable patient populations, an average peak VO_2 at baseline is 1300 ml/min and SD around 300 [18, 19]. A sample size of 74 would have a power of 80% and a 5% significance level.

Statistical analysis

All data were analysed by intention to treat.

Baseline data were compared using two-sided *t*-test for continuous variables and chi-square test for categorical variables. HADS scores were not normal distributed, although treated as such, since transformation of the data did not change the result.

To test the effect of the two interventions at 3 and 12 months, a mixed model of regression analysis was used with a time * treatment interaction term. The models were adjusted for age, gender and baseline value.

To evaluate predictors that significantly influence exercise capacity (6MWT and peak VO_2), the variables age, gender, congestive heart failure, dyspnoea, angina, co-morbidity, risk factors for coronary heart disease, medication, socio-demographic data and baseline scores of HADS and SF-12 were tested in the mixed model with the time * treatment interaction term. Variables were included and removed individually. The cut-off point for removing covariates from the model was set to $P > 0.10$. $P < 0.05$ was considered significant.

All statistical analyses were performed using STATA for windows release 10.0.

Results

A total of 75 patients participated; see the flow chart in Supplementary data available in *Age and Ageing* online. Baseline characteristics according to intervention are listed in Table 1 and show no significant differences between the two groups. In addition, no significant differences were found in the use of medication and in socio-demographic

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Table 1. Baseline characteristics according to intervention

Characteristic	Centre, *n* = 39	Home, *n* = 36
Age (years)	74.7 (5.9)	74.4 (5.8)
Men, *n* (%)	26 (66.7%)	19 (52.8%)
Risk factors		
Hypertension, *n* (%)	27 (69.2%)	25 (69.4%)
Hyperlipidemia, *n* (%)	36 (92.3%)	31 (86.1%)
Diabetes, *n* (%)	6 (15.4%)	10 (27.8%)
BMI (kg/m^2)	27.9 (4.4)	27.7 (5.0)
Current smokers, *n* (%)	14 (35.9%)	14 (38.9%)
Medical history		
Previous MI, *n* (%)	12 (30.8%)	10 (27.8%)
Previous PCI, *n* (%)	7 (18.0%)	7 (19.4%)
Previous CABG, *n* (%)	6 (15.4%)	6 (16.7%)
Heart failure LVEF ≤45%, *n* (%)	12 (30.8%)	14 (38.9%)
Event prior to entry into the study		
Post-MI without invasive procedure, *n* (%)	3 (7.7%)	4 (11.1%)
Post-PCI, *n* (%)	27 (69.2%)	24 (66.7%)
Post-CABG, *n* (%)	9 (23.1%)	8 (22.2%)
Clinical status		
Peak VO_2 (ml/kg/min)	14.3 (4.3)	15.0 (4.0)
Anaerobic threshold (ml/min)	824.9 (294)	883.5 (292)
6MWT (m)	339.8 (122)	329.2 (119)
STS	9.9 (4.1)	11.1 (4.5)
Systolic blood pressure (mmHg)	139.4 (23.2)	134.9 (19.6)
Diastolic blood pressure (mmHg)	75.3 (8.5)	74.1 (10.7)
Waist–hip ratio	0.9 (0.1)	0.9 (0.1)
Dyspnoea, NYHA II–IV, *n* (%)	22 (56.4%)	19 (52.8%)
Angina, CCS II–IV, *n* (%)	9 (23.1%)	7 (19.4%)
Self-reported active lifestyle, *n* (%)	20 (52.6%)	21 (60.0%)
Co-morbid conditions		
CMI score 0, *n* (%)	5 (12.8%)	1 (2.8%)
1–2, *n* (%)	13 (33.3%)	11 (30.6%)
≥3, *n* (%)	21 (53.9%)	24 (66.7%)
COPD, *n* (%)	8 (20.5%)	11 (30.6%)
Peripheral arterial disease, *n* (%)	14 (35.9%)	16 (44.4%)
Laboratory values		
Total cholesterol (mmol/l)	4.0 (1.2)	4.2 (0.9)
HDL cholesterol (mmol/l)	1.3 (0.6)	1.4 (0.5)
LDL cholesterol (mmol/l)	2.1 (1.1)	2.1 (0.7)
Health-related quality of life		
HADS anxiety score	3.2 (3.3)	4.4 (4.3)
HADS depression score	3.9 (3.3)	4.3 (3.6)
SF-12 PCS	39.9 (8.8)	37.4 (9.5)
SF-12 MCS	51.3 (8.9)	49.5 (12.2)

Values are presented as mean (SD) unless stated otherwise.
LVEF, left ventricular ejection fraction; MCS, mental component summary scale of SF-12; PCS, physical component summary scale of SF-12.

data (data not shown). All patients were treated with lipid-lowering drugs and 73.3% with beta-blockers.

Ten patients were not able to perform the exercise test, due to co-morbidity.

A total of seven patients died (centre *n*= 3 and home *n*= 4) and four patients dropped out (centre *n*= 2 and home *n*= 2). Their baseline data were comparable with baseline data from patients who continued in the study.

The group of non-participants were older (*P*= 0.04), more often had co-morbid conditions and heart failure (*P*= 0.02) and had a higher mortality rate, although this difference was not significant (hazard ratio 1.8, 95% CI 0.7, 4.3; *P*= 0.2).

Effect on exercise outcomes

Table 2 shows the effect of the interventions at 3 months from the adjusted mixed model of regression analysis with the time * treatment interaction term. For the primary outcome of exercise capacity, 6MWT increased by 17.4 m (95% CI −9.4, 44.2; *P*= 0.20) in the home group and 36.1 m (95% CI 9.8, 62.5; *P*< 0.01) in the centre group and peak VO_2 by 1.2 ml/kg/min (95% CI 0.1, 2.4; *P*< 0.05) and 0.4 ml/kg/min (95% CI −0.6, 1.4; *P*= 0.46), respectively, with no significant differences between the groups. No significant differences were found in the other outcome measurements.

Table 3 shows the follow-up data at 12 months. There was a significant decline in 6MWT and peak VO_2 in both the centre and the home group, with no significant differences between the groups. Approximately one-third of patients in both groups did not improve in exercise capacity after the intervention and continued to decline at 12 months follow-up. Predictors for lack of improvement were older age, having COPD and living alone. However, there were no indications of differences in the effect of the two interventions with increasing age, COPD and living alone, although statistical power to detect this was limited.

Other outcomes

No consistent patterns were seen for either clinical status outcomes, laboratory values or health-related quality of life at 3 and 12 months (Tables 2 and 3). However, there was a significant increase in HADS anxiety score in the centre group at 3 months followed by a decrease when ending the programme at 12 months.

The number and length of acute and non-acute admissions and adverse events (admission for MI, progressive angina, decompensated congestive heart failure, severe bleeding, new malignant disease and performance of PCI) were equally distributed at 12 months follow-up (data not shown).

Discussion

The results of this study indicate that home-based CR is as effective as centre-based comprehensive CR in an unselected group of patients ≥age 65 years with coronary heart disease. There were no significant differences between groups for the primary endpoints of exercise capacity and the secondary endpoints. These findings are consistent with the results from other trials [19–21] and could add to the evidence that home-based CR is a valid alternative to centre-based CR in elderly ≥65 years with coronary heart disease.

Exercise outcomes

This study demonstrated low to modest effect in both the home and the centre group for the primary outcome

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Table 2. Effect of interventions at 3 months within group and between groups

	Within-group centre		Within-group home		Between groups	
	Δ 0–3 months	95% CI	Δ 0–3 months	95% CI	Δ 3 months between home and centre	95% CI
Exercise data						
Peak VO_2 (ml/kg/min)	0.4	−0.6, 1.4	**1.2**	**0.1, 2.4****	0.9	−0.7, 2.4
Anaerobic threshold (ml/min)	30.5	−73.7, 134.7	15.7	−109.9, 141.3	−14.8	−177.8, 148.3
VE/VCO_2 slope	−1.3	−4.0, 1.4	−1.6	−4.8, 1.6	−0.2	−4.4, 3.9
Maximum heart rate	1.6	−4.1, 7.2	0.4	−6.6, 7.3	−1.2	−10.2, 7.8
O_2 pulse	0.01	−0.8, 0.9	0.5	−0.6, 1.6	0.5	−1.0, 1.9
6MWT (m)	**36.1**	**9.8, 62.5***	17.4	−9.4, 44.2	−18.7	−56.4, 18.9
STS	**1.3**	**0.1, 2.4****	−0.6	−1.8, 0.5	**−1.9**	**−3.6, −0.3****
Clinical status						
Systolic blood pressure (mmHg)	−2.3	−9.8, 5.1	−3.0	−10.6, 4.6	−0.6	−11.3, 10.0
Diastolic blood pressure (mmHg)	0.7	−3.1, 4.5	**−4.2**	**−8.1, −0.3***	−4.9	−10.4, 0.5
BMI (kg/m^2)	0.2	−0.3, 0.6	0.1	−0.4, 0.5	−0.1	−0.7, 0.5
Waist–hip ratio	0.0	−0.02, 0.02	0.01	0.01, 0.03	0.01	−0.02, 0.04
Cessation of smokers, *n* (%)	0 (0%)		0 (0%)		0 (0%)	
Self-reported active lifestyle, *n* (%)	**8 (23.5%)****		5 (14.7%)		−3 (8.8%)	
Laboratory values						
Total cholesterol (mmol/l)	−0.3	−0.6, 0.001	0.2	−0.2, 0.5	**0.5**	**0.02, 0.9****
HDL cholesterol (mmol/l)	−0.04	−0.2, 0.1	0.1	0.0, 0.2	0.2	−0.01, 0.3
LDL cholesterol (mmol/l)	−0.2	−0.4, 0.1	0.1	−0.1, 0.4	0.3	−0.04, 0.7
Cholesterol/HDL ratio	−0.02	−0.3, 2.7	−0.1	−0.4, 0.2	−0.1	−0.5, 0.3
Health-related quality of life						
HADS anxiety score	**1.8**	**0.6, 2.9***	−0.1	−1.2, 1.0	**−1.8**	**−3.4, −0.3****
HADS depression score	0.6	−0.4, 1.7	−0.2	−1.2, 0.8	−0.8	−2.3, 0.6
SF-12 PCS	0.5	−2.4, 3.4	1.4	−1.5, 4.3	0.9	−3.1, 5.0
SF-12 MCS	−0.2	−3.6, 3.2	0.8	−2.6,4.3	1.0	−3.8, 5.9

All data are adjusted for age and gender. A positive Δ indicates an increase in outcome at 3 months or is in favour of home-based rehabilitation. MCS, mental component summary scale of SF-12; PCS, physical component summary scale of SF-12. Boldface values indicate significance.

*$P < 0.01$.

**$P < 0.05$.

measurements of peak VO_2 and 6MWT. Other trials have found a higher effect after home and centre-based CR [21–25]. There are several likely explanations for this difference. Our population was much older and had a higher degree of co-morbidity, which are factors known to limit the effect of exercise training. In addition, the population was more deconditioned at baseline (mean peak VO_2= 14.6 ± 4.2 ml/kg/min corresponding to 4.2 ± 1.2 MET) and 6 weeks of intervention might be too short a duration to obtain a full effect. Moreover, most studies used the predicted values of exercise capacity (MET) as opposed to the direct measurement of VO_2 or did not standardise VO_2 with weight, which overestimates the effect of intervention [26].

One-third of our population did not improve in peak VO_2 and 6MWT irrespective of the type of intervention. Predictors for poorer outcome were older age, having COPD and living alone. This finding shows that exercise training of elderly cardiac patients is difficult and indicates that some patient groups need more attention and even more special designed exercise programmes. An initial screening of patients at the CR Units with focus on co-morbidity, disability and socio-demographic data could identify this high-risk group.

After completing the rehabilitation programme, patients in both groups had a decrease in exercise capacity at 6 months and a further significant decrease at 12 months. These findings are not consistent with two other reports that found a sustained improvement in exercise capacity if the exercise component was initiated at home [24, 27]. The discrepancy could be caused by several factors. In the study by Smith *et al.* [27] the population were younger (mean age 54.3 years) and patients with disability were excluded. In the study by Marchionni *et al.* [24], their intervention of 8 weeks was comparable with our intervention and the population included the elderly (mean age 75 years). However, their population of elderly were highly selected with the exclusion rate of 72% due to co-morbidity, disability and heart failure.

Other outcomes

No consistent pattern in the effect of interventions emerged. This was not surprising since the study was not powered to show an effect, and our findings correspond well with the results from other studies [1, 3, 5, 20]. In addition, our population had a higher degree of risk factor control at entry to the study, and hence a further decrease could not be expected.

The significant increase in HADS anxiety score in the centre group at 3 months could be explained by the psychological stress that may occur with the prospect of participating in the centre programme in unfamiliar settings.

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Table 3. Follow-up data at 12 months within group and between groups

	Within-group centre		Within-group home		Between groups	
	Δ 3–12 months	95% CI	Δ 3–12 months	95% CI	Δ 12 months between home and centre	95% CI
Exercise data						
Peak VO_2 (ml/kg/min)	**−2.0**	**−3.1, −0.9***	**−2.5**	**−3.8, −1.1***	−0.4	−2.1, 1.3
Anaerobic threshold (ml/min)	−90.3	−202.0, 21.3	−60.4	−194.9, 74.0	29.9	−144.9, 204.7
VE/VCO_2 slope	−0.4	−3.8, 3.0	0.6	−3.4, 4.7	1.1	−4.2, 6.4
Max. heart rate	−6.2	−12.4, 0.1	−5.1	12.8, 2.6	1.1	−8.8, 11.0
O_2 pulse	−0.7	−1.6, 0.2	−1.0	−2.1, 0.2	−0.2	−1.7, 1.2
6MWT	**−27.4**	**−51.5, −3.3****	**−44.8**	**−69.7, −19.8***	−17.4	−17.3, 52.1
STS	−0.2	−1.3, 1.0	−0.4	−1.6, 0.7	−0.3	−1.9, 1.4
Clinical status						
Systolic blood pressure (mmHg)	1.4	−5.7, 8.5	4.6	−2.9, 12.0	3.2	−7.1, 13.5
Diastolic blood pressure (mmHg)	−2.1	−6.0, 1.9	3.9	−0.2, 8.0	**6.0**	**0.3, 11.6****
BMI (kg/m^2)	0.3	−0.2, 0.7	0.2	−0.3, 0.6	−0.1	−0.8, 0.5
Waist–hip ratio	**−0.02**	**−0.04, −0.01****	0.0	−0.02, 0.02	0.02	−0.01, 0.05
Cessation of smokers, *n* (%)	**−3 (8.8%)***		**−2 (−6.7%)***		1 (3.3%)	
Self-reported active lifestyle, *n* (%)	0 (0%)		−4 (−13.3%)		−4 (−13.3%)	
Laboratory values						
Total cholesterol (mmol/l)	0.1	−0.2,0.3	−0.2	−0.4, 0.1	−0.2	−0.6, 0.1
HDL cholesterol (mmol/l)	0.03	−0.1, 0.2	− 0.03	−0.2, 0.1	−0.1	−0.2, 0.1
LDL cholesterol (mmol/l)	−0.02	−0.2, 0.2	−0.2	−0.3, 0.03	−0.1	−0.4, 0.1
Cholesterol/HDL ratio	−0.1	−0.4, 0.2	−0.1	−0.4, 0.2	0.03	−0.4, 0.4
Health-related quality of life						
HADS anxiety score	−1.1	−2.3, 0.1	−0.1	−1.3, 1.1	1.0	−0.7, 2.7
HADS depression score	0.3	−0.8, 1.4	**1.2**	**0.1, 2.3****	1.0	−0.6, 2.5
SF-12 PCS	1.2	−1.4, 3.8	1.0	−1.6, 3.6	−0.2	−3.8, 3.5
SF-12 MCS	2.6	−0.9, 6.0	2.3	−1.1, 5.7	−0.3	−5.1, 4.6

All data are adjusted for age and gender. A positive Δ indicates an increase in outcome at 12 months or is in favour of home-based rehabilitation. MCS, mental component summary scale of SF-12; PCS, physical component summary scale of SF-12. Boldface values indicate significance.

*$P < 0.01$.

**$P < 0.05$.

In our home-based programme, there was no systematic patient education and dietary counselling and tobacco cessation was optional. However, several meta-analyses have not found any differences in rehabilitation outcomes between programmes that solely offer the exercise component and programmes with additionally psychological and educational intervention [1–3].

Limitations of the study are first the numbers of patients included, which weakens the conclusion drawn from the study, but our study is not small compared with other exercise trials [7, 17]. Only 23% of eligible patients in our study consented to participate, which compromise the external validity. However, our inclusion rate is comparable with the inclusion rate in other CR trials [24, 28], and although disappointing, a similar participation rate is estimated to be present in the everyday setting at the CR units [29]. We cannot rule out that there is a difference between the home and the centre intervention as indicated by the confidence intervals. However, wide confidence intervals are often seen in exercise trials and our findings are in concordance with both the large BRUM trial [28] and the HF-ACTION trial. [17].

Conclusions

Home-based CR is as effective as comprehensive centre-based CR in a population of elderly patients with coronary heart disease. Patients with higher age, who live alone and have COPD, did not achieve an increase in exercise capacity which was independent of the type of intervention. Identification of this high-risk group is important and could be accomplished by a screening procedure at entrance to a CR programme. In addition, it is especially important to have close follow-up with continued guidance beyond the initial rehabilitation to improve sustainability of the effects.

Key points

- Home-based cardiac rehabilitation is as effective as centre-based cardiac rehabilitation in improving exercise capacity
- No differences were found between the two groups in blood pressure, body composition, smoking, HDL and LDL cholesterol.
- A sub-group of patients characterised by higher age, living alone and having COPD did not improve.
- Elderly patients with coronary heart disease have a high burden of comorbid conditions and disability.
- Continued guidence after the initial rehabilitation period is important in this fragile group of patients.

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Conflicts of interest

There is no conflict of interest to declare.

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Supplementary data

Supplementary data mentioned in the text is available to subscribers in *Age and Ageing* online.

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Comparison of centre and home-based health assessments: early experience from the Irish Longitudinal Study on Ageing (TILDA)

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Abstract

Background: some cohort studies of ageing and health supplement questionnaire-based surveys with in-home measurements of biological parameters and others have required respondents to attend assessment centres. Centre-based assessments facilitate detailed measurements and novel technologies, but may differentially influence participation. The aim of this paper is to compare the characteristics of participants who attended a centre with those who chose a home assessment and those who did not have a health assessment.
Methods: trained field workers administered a computer-assisted personal interview (CAPI) to a random sample of community-dwelling people aged 50 and over in the participants' homes. All questionnaire respondents were invited to attend an assessment centre for a comprehensive physical assessment. Participants who refused or were unable to attend a centre were offered a home assessment.
Results: of the 291 participants who completed the CAPI, 176 had a health assessment: 138 in an assessment centre and 38 in their own home. The centre, home and no visit respondents differed in demographic characteristics, behavioural factors, physical functioning and health. Lower socio-economic status, physical inactivity and current smoking were the most robust predictors of non-participation in the health assessment. Home respondents had the highest levels of physical disability and were much weaker (grip strength) and slower (walking speed) than centre respondents.
Conclusion: home and centre physical assessments are required to avoid systematically over-representing healthier and wealthier respondents.

Keywords: *ageing, health assessment, cohort study, elderly*

Introduction

In order to describe fully the health and well-being of older people, both questionnaire and biological measurements are required [1, 2]. A number of ongoing nationally representative cohort studies of older people, which were originally developed based on the collection of questionnaire data by personal interviews, have supplemented their data collection

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