Exercise-based cardiac rehabilitation, physical fitness, and physical activity in cardiac disease

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Arvid Carlsson, Medicinaregatan 3, den 5 oktober 2018, klockan 13.00

Av

Maria Borland

Fakultetsopponent:
Docent Anita Wisén,
Medicinska fakulteten, Institutionen för hälsovetskaper
Lunds Universitet, Sverige

Avhandlingen baseras på följande delarbeten


SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR NEUROVETENSKAP OCH FYSIOLOGI
Exercise-based cardiac rehabilitation, physical fitness, and physical activity in cardiac disease

Health and Rehabilitation/Physiotherapy, Institute of Neuroscience and Physiology, Sahlgrenska Academy, University of Gothenburg

Maria Borland

Abstract

Background: Evidence suggests that individualised exercise-based cardiac rehabilitation should be offered to patients with ischemic heart disease and chronic heart failure (HF) because it improves physical fitness and health-related quality of life (HR-QoL), and reduces cardiac mortality and hospital admissions. If physiotherapist-led exercise-based cardiac rehabilitation (PT-X) can similarly improve physical fitness in patients with atrial fibrillation (AF), and improve physical activity levels in patients with chronic HF or permanent AF, has been sparsely studied. In addition, whether increased physical activity in patients with chronic HF or permanent AF can improve physical fitness in the same way as exercise has not been evaluated.

Aim: The general aim for this thesis was to investigate the effect of individually prescribed PT-X in elderly patients with chronic HF or permanent AF especially in regards to exercise modality, physical fitness, level of physical activity, HR-QoL, and metabolic risk factors.

Method and Main Findings: Study I. A randomised controlled trial (RCT) in patients with chronic HF and comorbidity investigating the effect of PT-X regarding the level of physical activity, physical fitness (i.e., exercise capacity and muscle function), and HR-QoL. Physical activity did not increase significantly after PT-X, though self-reported physically activity levels were higher. Physical fitness and HR-QoL improved significantly in the PT-X group compared to the control group. Study II. A RCT multicentre trial comparing PT-X and physical activity on prescription (PAP) with regard to physical fitness, level of physical activity, HR-QoL and metabolic risk markers in patients with permanent AF. Physical fitness improved significantly in PT-X compared to PAP. PAP increased energy expenditure but not physical fitness. No significant difference was found in HR-QoL or metabolic risk markers. Study III. A 3-month follow-up of study II investigating the effect of 3 months detraining with respect to physical fitness, level of physical activity, and HR-QoL in patients with permanent AF. The improvements achieved in physical fitness in the PT-X group decreased significantly with detraining, and HR-QoL was markedly reduced.

Conclusion: PT-X is well tolerated and safe and, therefore, should be used to improve physical fitness in patients with chronic HF or permanent AF. Neither PT-X nor PAP increases the physical activity level. PT-X improves HR-QoL in patients with chronic HF but not in patients with permanent AF. In patients with permanent AF, it is important to continue exercising because detraining reverses the gains in physical fitness obtained from PT-X and markedly decreases HR-QoL.

Keywords: exercise-based cardiac rehabilitation, exercise, physical fitness, physical activity, health-related quality of life, atrial fibrillation, heart failure.