

## The efficacy of cardiac rehabilitation on exercise performance in men and women

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**Background:** Over the last years exercise training has gained IA class recommendation as a core component of cardiac rehabilitation (CR) in patients with coronary artery disease (CAD). Despite the strong evidence of higher mortality and rehospitalisation rates in women compared with men with CAD, women are less frequently enrolled in CR programs and show lower exercise adherence. However, when enrolled women showed similar improvement as men, but this remains to be further elucidated.

**Purpose:** The aim of this study was to examine the gender differences in improvement of exercise performance in patients with CAD following CR programme.

**Methods:** A total of 91 patients with CAD (74 men and 17 women, mean (SD), aged 59 (11) years and 60 (10) years,  $p > 0.05$ ; median (interquartile range), height 177 (173, 181) cm and 159 (158, 167) cm,  $p < 0.001$ ; weight 92.1 (82.4, 98.6) kg and 72.3 (69.1, 79.6) kg,  $p = 0.001$ , respectively) participated in out-patient CR. Each patient completed 36 exercise sessions comprised of general warm up with calisthenics, followed by 5 aerobic intervals of cycling on stationary bikes (5 minutes of loaded cycling at the intensity of 50 %-70% of peak power separated by 2 minutes intervals of unloading cycling) and finished with stretching and breathing exercises. Training load and target training heart rate were increased every two weeks. The exercise test was performed at baseline and after CR.

**Results:** At baseline, there was a significant difference between men and women in peak power (P max) (men 122 (25) W vs. women 74 (19) W,  $p < 0.001$ ), maximum oxygen consumption (VO2 max; men 19.45 (3.60) ml/kg/min vs. women 16.00 (3.35) ml/kg/min,  $p < 0.001$ ) and exercise test time (men 658 (150) s vs. women 363 (115) s,  $p < 0.001$ ). During the training both genders increased training intensity (men: +34 (12) W and women: +25 (9) W, both  $p < 0.001$ ) and target heart rate (men: +10 (5, 19) bpm and women: +10 (5, 20) bpm, both  $p < 0.001$ ), whereas training intensity was increased more in men than women (+9 W,  $p = 0.003$ ). Exercise training led to improvement in P max (men: +15 (20) W,  $p < 0.001$ , women: +14 (12) W,  $p < 0.001$ ), VO2 max (men: +1.87 (2.52) ml/kg/min,  $p < 0.001$ , women: +2.47 (2.05) ml/kg/min,  $p < 0.001$ ) and exercise test time (men: +99 (134) s,  $p < 0.001$ , women +95 (90) s,  $p < 0.001$ ). In addition, after adjusting for baseline values there were no sex differences in post training P max, VO2 max and exercise test time.

**Conclusions:** CR improved the exercise performance similarly in men and women, thus, more women should be encouraged to enrol into CR programmes. Still, larger and adequately powered randomised studies are warranted to further elucidate this issue.