Sex differences in cardiovascular and all-cause mortality in middle-aged and older participants of a medically-supervised exercise program

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Background: Physical inactivity has been shown to be associated with all-cause mortality in both healthy and unhealthy middle-aged and older individuals. While regular exercise is equally recommended for men and women, it is virtually unknown if sex influences the long-term survival among participants of a medically-supervised exercise program (MSEP).

Purpose: To evaluate if cardiovascular and all-cause mortality differs between men and women who participates in a MSEP.

Methods: Retrospective data from an open cohort of individuals aged 36 to 85 years old (66% men) who participated in a private MSEP between March 1994 and December 2018 were analyzed. The participants were free to attend the exercise sessions anytime from 6 a.m. to 9:30 p.m. (Monday to Friday) or 7 a.m. to 4 p.m. (Saturday). In median, the participants completed 47 sessions (1 to 5992 sessions) and attended for 6 months. Exercise sessions last between 60-80 minutes on average and included aerobic, muscle power, flexibility and balance exercises for all participants. Depending on clinical condition, gross and fine motor coordination, inspiratory muscle and isometric handgrip training were also performed under direct supervision of a multiprofessional team. Before each exercise session, the participant was briefly assessed by the exercise physician and the aerobic exercise part was individually prescribed based on pre-participation evaluation/previous session data. Kaplan-Meier survival curves were separately determined for men and women - cardiovascular and all-cause mortality - and statistically compared by log rank test.

Results: Men and women had identical mean ages of 62.5 years-old (p>0.99) and median follow-up was 11 years, ranging from 0.1 to 24.8 years. From a total of 2,238 participants with different disorders (68% with coronary artery disease), 465 died (21%), with almost three times higher death rate for men (15.1%) as compared to women (5.7%) (p<0.001). Cardiovascular deaths were 27% of total and also proportionally more frequent in men than women (HR 0.63, 95% CI 0.44-0.9; p=0.012). Women had a higher long-term overall survival rate than men (83% vs. 77%, respectively, HR 0.66, 95% CI 0.55-0.80; p<0.001).

Conclusion: Long-term cardiovascular and all-cause mortality were much higher in men than women that participated in a MSEP and these differences could not be explained by age. Future studies are needed to explain these findings and to analyze if men and women in MSEP would need similar dose of exercise for better survival benefit.
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