

Patophysiologic and gender differences regarding exercise responses in decompensated heart failure patients

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Funding Acknowledgements: Type of funding sources: None.

Introduction: Heart Failure patients often present impairment on their functional capacity. Exercise training is the key component of cardiac rehabilitation and must be early implemented. Knowing the characteristics that lead a patient to be a good responder to an exercise intervention would be useful to identify the ones that could benefit from this same intervention.

Purpose: Identify the characteristics of good responses to an aerobic exercise training in decompensated heart failure (HF) patients and understand if there are gender differences.

Methods: Cross sectional study with 76 inpatients who performed an aerobic exercise training program (AET). Functional capacity was evaluated at admission and discharge using three different tools: the London Chest of Activity of Daily Living (LCADL) scale, the Barthel Index (BI) and the 6-minute walking test (6MWT). Multivariate linear regression was performed by gender to understand which variables lead a patient to have better performance. Since it is known that men and women have different responses to exercise training, the results and analysis of the data collected were performed by gender.

Results: Seventy-six patients (52 men) were included. The mean age was 67 ± 10 years, 15.8% were New York Heart Association (NYHA) class IV and 76.3% had reduced ejection fraction. The major etiology of HF was ischemic disease (35.5%). Six predictive equations were obtained, one for each functional capacity (FC) tool divided by gender. NYHA class III patients do not differ from class IV in terms of FC at discharge. However, HF reduced ejection fraction patients presented higher 6MWT distance (309,6m vs 231m) and lower LCADL score (11 vs 15) compared to non-reduced. Gender analysis showed that women had an average of 4 days longer in-hospital stay and a considerable difference in the 6MWT. At admission women walked 15 meters less than men and at discharge 69 meters less, presenting also lower score at BI and higher at LCADL. However, only the discharge 6MWT distance presents a statistical significant difference (69 meters; $p = 0.01$). Traditionally women are more sedentary and present less fitness level than men. The linear regression model shows that gender is an independent variable that contributes to the change in the 6MWT - favouring men.

Conclusions: The AET program appears to be more effective in younger patients, with low FC at admission and who are less impaired. Those with left systolic ventricular function apparently interfered with progression during the program. Gender influences the performance of patients undergoing exercise training. Men present higher FC at discharge but the predictive models are stronger for women. These results are consistent with the idea that gender plays an important role in determine the performance of patients in exercise training programs.