Severity of depression and its relationship with the parameters obtained in the cardiopulmonary exercise test in patients of a cardiac rehabilitation program

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Background: Cardiovascular diseases are the leading cause of global morbidity and mortality. Depression causes specific disorders such as autonomic nervous system dysfunction, neurohormonal axis imbalance, proinflammatory and prothrombotic states. The alteration profiles in the parameters measured in the cardiopulmonary exercise testing (CPET) associated with the different severities of depression have not yet been characterized.

Purpose: To determine the association of the degree of depression and the parameters obtained in the CPET in patients undergoing a cardiac rehabilitation program.

Methods: Observational, comparative, cross-sectional, retrospective study of adult patients examined in the period from January 1, 2010 to December 31, 2017. Independent variables were degrees of depression according to Beck depression inventory, dependent variables were parameters reported in the CPET. Categorical variables were reported in frequency and continuous variables as averages. The comparison between groups was made with x2, T test, ANOVA according to type and number of variables and their distribution. Pearson's correlation to determine association.

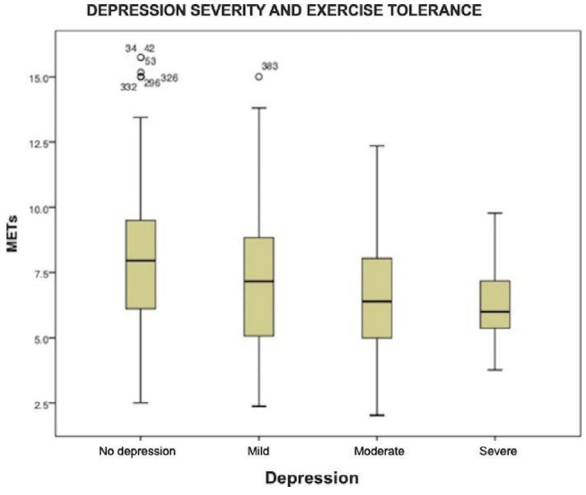
Results: From a total of 594 patients: 490 were men (82.4%), age 57.34±11.3. Maximum METs 7.49±2.42, heart rate (HR) response (percentage of theoretical maximum heart rate achieved) 82.79±12.69 and systolic blood pressure response (SBP) (ratio of peak SBP to resting SBP) 1.29±0.18. Bivariate analysis found significant differences between Beck's depression scale and study variables: Male ($p<0.0001$), married ($p=0.022$), diabetes ($p=0.012$), surgical revascularization ($p=0.05$), use of angiotensin II receptor antagonists ($p=0.027$).

Conclusions: The present study found association of depressive symptoms with male gender, married marital status, diabetes, surgical myocardial revascularization and treatment with angiotensin II receptor antagonists. In the CPET, significant differences were found in exercise tolerance measured by METs, HR response and SBP response between subjects without depression and those with mild and moderate depression.

Depression Severity and Study Variables

	No depression	Mild	Moderate	Severe	p
Gender	M (315), F (45)	M (113), F (30)	M (57), F (28)	M (5), F (1)	0.000
Single (S) Married (M)	S (44) M (242)	S (19) M (104)	S (7) M (54)	S (3) M (2)	0.022
Diabetes	97	58	33	2	0.012
Surgical revascularization	52	9	13	0	0.05
ARB	56	22	24	2	0.027

ARB: angiotensin receptor blocker.



Depression and Exercise Tolerance