

Anxiety, Depression and Stress Management

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The influence of exercise on Cortisol, Anxiety and Stress levels in patients with Depression

Clinical depression has been connected with cortisol changes, high stress and anxiety levels. The neurobiology of depression has not been totally understood yet, but there is support demonstrating that stressful life events and dysregulation on the stress physiology, especially in the hypothalamus-pituitary-adrenal (HPA) axis are strongly associated. Changes in plasma concentrations e.g. in cortisol have been systematically reported.

We examined the effects of exercise in patients with depression on cortisol, stress and anxiety levels. Nineteen women with clinical depression were randomly assigned to one of two groups: aerobic exercise plus pharmacotherapy or only pharmacotherapy. Control group involved ten patients who carried on with their usual pharmacological therapy but without exercise and the exercise group included nine patients that performed aerobic exercise, 45-50 min/session, three times/week, for 16 weeks. Cortisol in plasma was measured using the chemiluminescent ADVIA Centaur Cortisol immunoassay and Depression Anxiety Stress Scale-21 (DASS-21) was used to assess anxiety and stress levels.

Results showed that anxiety and stress sub-scales (assessed by DASS-21) presented a significant reduction that indicated an anxiolytic exercise effect. Exercise group had a statistically

significant and large effect on both anxiety ($p=0.025$; $\eta^2p=0.262$) and stress ($p=0.012$; $\eta^2p=0.316$) scores. After exercise intervention cortisol response to exercise did not differ when we observed the interaction between time X group ($F(1,17)=1.724$, $p=0.207$, $\eta^2p=0.092$). Since no significant changes in cortisol plasma levels between groups were found, it was not possible to bridge the effect of exercise in depressive symptoms and cortisol levels. The lack of significant difference between groups may be explained by the small sample size and patients' large age range (18–65 years), which could contribute to a greater result variability and the inclusion of patients diagnosed with different subtypes of depressive pathology. Data are preliminary outcomes from a small sample and should be replicated.

Speaker Biography

Lara S F Carneiro, BSc (Sports Science), MSc and PhD, is a Lecturer in the exercise and mental health field. She was a PhD fellow in 2012 by the Portuguese Foundation for Science and Technology, after leading a trial of exercise for major depressive disorder. In 2014 she was awarded the first prize of Psychology and Pedagogy in Sports with the investigation "Exercise as a complementary treatment of pharmacotherapy in patients with clinical depression" by the Portuguese Olympic Committee and the Millennium BCP Foundation. She is interested in the effects of exercise on major depressive disorder, its moderators, and its neurobiological correlation. She has participated in national and international conferences as an invited speaker and keynote.

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