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Impact of exercise on catechol-O-methyltransferase activity in depressive patients: A preliminary communication

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Statement of the Problem: Catechol-O-methyltransferase (COMT) is a catabolic enzyme involved in the degradation of monoamines including the neurotransmitter dopamine. In fact, a decreased level of endogenous dopaminergic neurotransmitter has been reported in depressive subjects, as well as higher COMT activity in depressive patients in comparison to non-depressed subjects. Exercise has become increasingly accepted as an effective therapy in reducing depressive symptoms. However, the neurobiological mechanisms underpinning this improvement remain poorly clarified. The present study provides a key contribution to understand the paths by which exercise modulates the monoamine system. Indeed, the effect of exercise on COMT activity is unknown and it remains to be explained if chronic exercise changes COMT activity. This randomized control trial assesses the effects of chronic exercise on a soluble cytoplasmic isoform (S-COMT) activity in women with clinical depression.

Methodology & Theoretical Orientation: Fourteen women (aged: 51.4±10.5 years) diagnosed with clinical depression (according to the International Classification of Diseases-10) were randomized to one of two groups: Pharmacotherapy plus exercise (n=7) or only pharmacotherapy (n=7). The aerobic exercise program comprised a 45-50 min/session, three times a week for 16 weeks. Erythrocyte soluble COMT has been evaluated before and after the exercise intervention.

Findings: Exercise group in comparison to control group demonstrated a significant decrease ($p=0.02$, $r=-0.535$) in S-COMT activity between baseline and after 16 weeks.

Conclusion & Significance: Adding exercise to the usual treatment (pharmacotherapy) decreases significantly S-COMT activity levels of clinical depressed patients after 16 weeks. Our results provide evidence that exercise interferes with S-COMT activity, a molecular mechanism involved in depression.

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