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Does ceasing exercise induce depressive symptoms? A systematic review of experimental trials including immunological and neurogenic markers.

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Abstract

Background

Regular exercise in adults improves depressive symptoms (DS) and major depressive disorder (MDD), however the clinical effects of ceasing exercise are largely unknown.

Methods

Seven databases were searched from inception to December 2017. Eligibility criteria included English language studies investigating the effects of ceasing exercise on DS or MDD in regularly active adults with or without prior DS or MDD. Blood based markers related to exercise cessation (EC) were assessed, if recorded. Studies investigating exercise follow-up periods were excluded.

Results

No studies investigated EC in MDD. Six studies including two RCTS and three studies investigating neurogenic and immune biological markers associated with DS met inclusion criteria (152 healthy adults, females n=50/32.89%). Compared to baseline, EC increased DS after three days, one week, and two weeks. Female participants had significantly more DS than male participants. Following EC, no changes in brain derived neurotrophic factor (BDNF) or tumour necrosis factor alpha (TNF) were evident, however C-reactive protein (CRP) at week one and interleukin 6 (IL6) at week two were reduced.

Limitations

Quality concerns including risks of attrition and reporting bias limit our confidence in these results.

Conclusions

Ceasing regular exercise increases DS in healthy adults, with greater DS in females than males. Contrary to the cytokine/inflammatory hypothesis of depression, DS was associated with reduced CRP and IL6 and without increased TNF. High quality trials are needed to extend this field of research in both healthy and MDD populations.

Keywords

Neuroimmunomodulation; Depression; Exercise; Inflammation; Mental disorders; Neurogenesis.

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