Coenzyme Q10 displays antidepressant-like activity with reduction of hippocampal oxidative/nitrosative DNA damage in chronically stressed rats.

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BACKGROUND: Multiple evidences suggest that depression is accompanied by an induction of oxidative/nitrosative stress (O&NS) pathways and by a reduced antioxidant status. Coenzyme Q10 (CoQ10) is an essential cofactor in the mitochondrial electron transport pathway and has a powerful antioxidant capacity.

METHODS: This study investigated the effect of chronic treatment with CoQ10 (25, 50, 100 and 150mg/kg/day, i.p. for 3 weeks) on depressive-like behavior and hippocampal, O&NS, and DNA damage, induced by chronic restraint stress (CRS), an experimental model of depression, in rats.

RESULTS: CoQ10 showed a significant antidepressant effect, as evidenced by amelioration of CRS-induced behavioral aberrations in forced swimming and open field tests, elevated corticosterone level and body weight loss. Moreover, CoQ10 dose-dependently restored the hippocampal catalase, glutathione peroxidase and reduced glutathione and decreased the hippocampal malondialdehyde, nitric oxide and 8-hydroxy-2'-deoxyguanosine levels, which indicated a potential protective effect of CoQ10 against hippocampal O&NS lipid peroxidation and DNA damage.

CONCLUSION: CoQ10 possesses antidepressant activity and can protect against CRS-induced hippocampal DNA damage which could be mediated in part by maintaining mitochondrial function and its well documented antioxidant properties. Therefore, CoQ10 may have a potential therapeutic value for the management of depressive disorders. However, further research, is still required to characterize the mechanism of the antidepressant effect of CoQ10 and extend these results before the safe application in humans.

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