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# Essential fatty acid-rich diets protect against striatal oxidative damage induced by quinolinic acid in rats

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## Abstract

Essential fatty acids have an important effect on oxidative stress-related diseases. The Huntington's disease (HD) is a hereditary neurologic disorder in which oxidative stress caused by free radicals is an important damage mechanism. The HD experimental model induced by quinolinic acid (QUIN) has been widely used to evaluate therapeutic effects of antioxidant compounds. The aim of this study was to test whether the fatty acid content in olive- or fish-oil-rich diet prevents against QUIN-related oxidative damage in rats. Rats were fed during 20 days with an olive- or a fish-oil-rich diet (15% w/w). Posterior to diet period, rats were striatally microinjected with QUIN (240 nmol/ $\mu$ l) or saline solution. Then, we evaluated the neurological damage, oxidative status, and gamma isoform of the peroxisome proliferator-activated receptor (PPAR $\gamma$ ) expression. Results showed that fatty acid-rich diet, mainly by fish oil, reduced circling behavior, prevented the fall in GABA levels, increased PPAR $\gamma$  expression, and prevented oxidative damage in striatal tissue. In addition none of the enriched diets exerted changes neither on triglycerides or cholesterol blood levels, nor or hepatic function. This study suggests that olive- and fish-oil-rich diets exert neuroprotective effects.

Keywords: Essential fatty acids, Olive oil, Fish oil, Oxidative damage, Huntington's disease



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