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Beneficial effect of oral supplementation of virgin coconut oil on methotrexate induced cerebral neurotoxicity and inflammation in rats

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Background: Methotrexate is an anticancer drug associated with several toxicities on organs through oxidative stress and inflammation. The study evaluated oral supplementation of virgin coconut oil (VCO) against cerebral neurotoxicity and inflammation induced by methotrexate (MTX) in rats.

Methods: Eighteen Wistar rats were divided into three groups (n=6) as Control, MTX and VCO + MTX. Rats were orally administered VCO (5 mL/kg) for 17 consecutive days, while a single dose of MTX (20 mg/kg bw, i.p.) was administered on day 14 only. Homogenate samples obtained from the cerebrum were used to analyze antioxidant enzymes, reduced glutathione (GSH), malondialdehyde (MDA), nitric oxide (NO), acetylcholinesterase (AchE) and inflammatory cytokines tumor necrosis factor-α (TNF-α) and interleukin-6 (IL-6).

Results: MTX administration significantly ($p<0.05$) reduced activities of antioxidant enzymes and level of GSH in cerebrum, whereas MDA, NO, AchE, TNF-α and IL-6 levels significantly ($p<0.05$) increased in cerebrum relative to normal control. In contrast, oral supplementation of VCO attenuated the MTX induced biochemical alterations relative to MTX group in the current study.

Conclusion: Our findings suggest beneficial effect of VCO against MTX neurotoxicity. Oral supplementation of VCO may prevent MTX neurotoxicity in cancer patients.

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