



Dietary tocotrienol/gamma-cyclodextrin complex increases mitochondrial membrane potential and ATP concentrations in the brain of aged mice

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Brain aging is accompanied by a decline in mitochondrial function. In vitro studies suggest that tocotrienols, including gamma- and delta-tocotrienol (T3), may exhibit neuroprotective properties [1]. However little is known about the effect of dietary T3 on mitochondrial function in vivo. In this study we monitored the effect of a dietary T3/gamma-cyclodextrin complex (T3CD) on mitochondrial membrane potential and ATP levels in the brain (cortex) of 21 month old aged mice. Mice were fed either control diet or a diet enriched with T3CD providing 100 mg T3 per kg diet for 6 months. Dietary T3CD significantly increased mitochondrial membrane potential and ATP levels as compared to controls. The increase of MMP and ATP due to dietary T3CD was accompanied by an increase in the protein levels of the mitochondrial transcription factor A (TFAM). Furthermore dietary T3CD slightly increased mRNA levels of superoxide dismutase, gamma-glutamyl cysteinyl synthetase and heme oxygenase 1 in the brain. Overall, present data suggest that T3CD increases TFAM, mitochondrial membrane potential and ATP synthesis in the brain of aged mice.

Literatur

- [1] S. G. Khee, Y. A. Yusof, S. Makpol, "Expression of senescence-associated microRNAs and target genes in cellular aging and modulation by tocotrienol-rich fraction," *Oxidative Medicine and Cellular Longevity*, 725929, 2014, doi:10.1155/2014/725929.