

Effect of Chronic Administration of L-Tyrosine on Energy Metabolism in Rat Brain Treated With Omega-3

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Introduction: The enzyme tyrosine aminotransferase deficiency characterizes the inborn error of metabolism tyrosinemia type II, leading to increased levels of tyrosine and its by-products in plasma, resulting in eye, skin and neurological injuries. Whereas the mechanisms of brain injury are not well known, that studies indicate the involvement of changes in energy metabolism and oxidative stress in the pathophysiology of tyrosinemia, and there is an appropriate treatment. **Objectives:** The study aims to assess the omega-3 administration effect in the activity of complex I, II, III-III and IV of the mitochondrial respiratory chain, and creatine kinase in the developing rat brain subjected to animal model of hypertyrosinemia. **Material and Methods:** The animals were divided into 4 groups: control (tween + water), L-tyrosine (L-tyrosine + water), omega3 (omega-3 + tween) and L-tyrosine + omega-3. The treatment were realized in the 7th to the 28th day of life of the animal, being administered L-tyrosine (500 mg/kg body weight) intraperitoneally in 12/12 hours and omega-3 (0.1 g/kg body weight) by gavage only once a day. Twelve hours after the last administration, the animals were euthanized and the structures, cortex, hippocampus and striatum were separated for analysis. **Results and Discussion:** Our results showed that L-tyrosine inhibit the activity of complex I, II, III and IV in the striatum, and the administration of omega-3 reversed the damage to the partially complex I, and the overall activity of the complex II III and IV in the striatum. The creatine kinase activity was also decreased in the striatum in the tyrosine group, and the omega-3 reversed the damage. **Conclusions:** From these results, we suggest that chronic administration of L-tyrosine causes alterations in energy metabolism mainly in the striatum, and the omega-3 administration can be a potent adjuvant treatment for patients with tyrosinemia type II.

Keywords: tyrosinemia type II; omega-3; energy metabolism.
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