Intracerebroventricular Administration Of Octanoic Acid Decreases NGF And BDNF Levels In Rat Brain

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Introduction: Medium-chain acyl-CoA dehydrogenase deficiency (MCADD) is the most frequent fatty acid oxidation disorder. MCADD patients present tissue accumulation of octanoic acid (OA). Clinically, progressive encephalopathy, drowsiness and lethargy that may develop into coma and death are found. Material and Methods: In the present work we investigated the effect of intracerebroventricular OA administration on neurotrophins levels in cerebral cortex, striatum, cerebellum and hippocampus of rats. Sixty-day-old Wistar rats received a single intracerebroventricular OA injection (1.66 μmol) through a cannula implanted using stereotaxic equipment. Control animals received artificial cerebral spinal fluid in the same volume. Animals were killed 1 h after OA administration and cerebral cortex, striatum, cerebellum and hippocampus were isolated. Nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF) were determined using commercial kits. Results: It was observed that OA administration reduced both NGF and BDNF levels in the striatum and reduced NGF levels in hippocampus. On the other hand, neurothrophin levels were not altered in cerebral cortex and cerebellum of these rats, when compared to control group. Conclusion: Taken together, these data suggest that OA induced alterations on synaptic plasticity and may help to explain, at least in part, the characteristic brain dysfunction observed in MCADD patients.

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