Evaluation of Neurotrophins Levels in Brain of Rats Submitted to Experimental Model of Methylmalonic Acidemia

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INTRODUCTION: The methylmalonic acidemia is characterized by tissular accumulation of methylmalonic acid (MMA), due to deficient activity of the enzyme L-methylmalonyl-CoA mutase. The prevalence of this disease is estimated at 1:48,000 live births and its main clinical manifestations are neurological damage and chronic renal failure. In this study, we evaluated the levels of neurotrophins in cerebral cortex of rats subjected to an experimental model of methylmalonic acidemia associated with a model of acute renal failure induced by Gentamicin (GM).

MATERIAL AND METHODS: It was conducted an experimental study with 30 days old male Wistar rats, divided into 4 groups: MMA, GM, GM + MMA and control. All the animals received an intra-peritoneal injection of saline or GM and after one hour, three subcutaneous injections of either saline MMA, with an interval of 11 hours between each administration. One hour after the last injection, the animals were euthanized by decapitation. The cerebral cortex was isolated, homogenized, and levels of neurotrophins NGF and BDNF were assessed using commercial kits.

RESULTS AND DISCUSSION: It was observed a significant decrease in the levels of NGF in the cerebral cortex of rats treated with Gentamicin alone, and associated with MMA, without changing the levels of BDNF. Furthermore, administration of MMA alone did not significantly alter the levels of BDNF or NGF. CONCLUSIONS: The results presented in this study show that high concentrations of MMA associated with kidney failure cause a decrease in the levels of NGF. These findings may be involved in the pathophysiology of brain damage found in patients affected by methylmalonic acidemia.

Key words: methylmalonic acidemia; methylmalonic acid; acetylcholinesterase; Neurotrophins
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