Effect Of Hyperphenylalaninemia On Acetylcholinesterase Activity And RNA Expression In Brain Of Young Rats

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Introduction: Hyperphenylalaninemia is found in patients affected by phenylketonuria (PKU), a genetic disease caused by a deficiency of phenylalanine hydroxylase (PAH) activity. Brain damage is a common characteristic of PKU patients, although the pathophysiology is still uncertain. Aim: The aim of the present work was to investigate the effect of acute phenylalanine (Phe) administration on acetylcholinesterase (AChE) activity and its relative RNA expression in brain of rats. Methods: Male 30-day-old Wistar rats received a single subcutaneous Phe injection (5.2 µmol/g) and/or p-chlorophenylalanine (p-Cl-Phe, 0.9 µmol/g), an inhibitor of PAH. Control group received saline solution at the same volume. One hour after administration, cerebral cortex, striatum and hippocampus were isolated and the AChE activity and its relative RNA expression were determined. Results: We observed that animals subjected to hyperphenylalaninemia (Phe plus p-Cl-Phe) presented an increase of AChE activity only in striatum, when compared to control group. However, we did not observe any alteration in its mRNA expression. Conclusion: Our results suggest that hyperphenylalaninemia induced cholinergic alterations and might contribute to the brain damage observed in PKU patients.

Password: phenylalanine, acetylcholinesterase, brain, phenylketonuria

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