EFFECTS OF AMYLOID-β PEPTIDE AND MELOXICAM-LOADED NANOCAPSULES ON ENERGETIC METABOLISM ENZYMES IN HIPPOCAMPUS OF MICE

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Alzheimer’s disease (AD) is the most common form of dementia and cognitive impairment, begin characterized by accumulation of amyloid-β peptide (aβ). Neurodegenerative disorders have shown alterations in cerebral energy metabolism. Clinical studies indicated that some non-steroidal anti-inflammatory drugs (NSAIDs) could reduce the prevalence of AD. Meloxicam is a NSAID that poorly crossed the blood–brain barrier, limiting the use of this drug for the treatment of neurodegenerative disorders. Considering few studies about the involvement of energy metabolism enzymes in neurodegenerative diseases, in the present study we investigated the activities of creatine kinase (CK), adenylate kinase (AK) and pyruvate kinase (PK) after injection of aβ (25-35) in hippocampus of mice. Moreover, the effect of meloxicam-loaded nanocapsules in restoring enzyme activities was studied. Mice received aβ (3 nmol/ 3 µl/ per site) or filtered water intracerebroventricular. One day after, mice were treated with blank nanocapsules or meloxicam-loaded nanocapsules (M-NC) or free meloxicam (M-F) intragastrically via gavage (5 mg/kg). Treatments were performed each other day, until the fourteenth day, mice were killed and hippocampus was removed for determination of enzymatic activities. Statistical analysis were performed using a two-way analysis of variance followed by the Tukey’s test and values p < 0.05 were considered statistically significant. No significant difference was observed among the groups for the activity of CK mitochondrial fraction. However, mice injected aβ and treated with M-NC decreased CK activity in cytosolic fraction. Moreover, animals injected aβ and treated with M-NC showed a decrease in AK activity, another important enzyme for brain energy metabolism. Finally, for the PK activity in cytosolic fraction, did not demonstrated significant difference amount groups. In conclusion, more studies are needed to evaluate the enzymes of energy metabolism in this model of AD, as well as the effects of treatment with M-NC in the phosphoryltransfer network.

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