

Protective Effect of Alpha-melanocyte Stimulating Hormone in Cognitive Impairment and Oxidative Stress Associated with the Consumption of a High-fat Diet [†]

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Abstract: Long-term consumption of a high-fat diet (HFD) could induce neuroinflammation and enhance oxidative stress. However, consumption of an HFD for a short period of time can exacerbate the inflammatory response to a mild immune challenge, especially in the hippocampus, an area involved in contextual memory. Alpha-melanocyte stimulating hormone (α -MSH) exerts anti-inflammatory and neuroprotective effects. We studied whether short-term (5 days) HFD consumption plus a mild immune challenge (LPS 10 μ g/Kg), could induce cognitive deficits and an increase of oxidative stress. Our results show that short-term HFD does not affect body weight; however, it produces changes in total cholesterol. HFD impaired contextual fear memory in rats that received LPS. This effect was associated with increased markers of oxidative stress in the dorsal hippocampus. We observed an increase in advanced oxidation protein products (AOPP) and malondialdehyde (MDA) of 1182 and 183 percent, respectively. The treatment with α -MSH reverses both effects: the impairment in contextual memory and the increase in oxidative stress.

Our results indicate that HFD consumption for a short period sensitizes the central nervous system (CNS) to a subsequent immune challenge and produces impairment in the contextual fear memory that could be related to changes in oxidative stress. α -MSH could have a protective effect.

Keywords: high-fat diet; neuroinflammation; α -MSH; memory; hippocampus; oxidative stress.

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Conflicts of Interest

The authors declare no conflict of interest.