

Abstract

J Nutr Biochem. 2010 Apr;21(4):351-356.

Dietary omega-3 fatty acids attenuate cellular damage after a hippocampal ischemic insult in adult rats.

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OBJECTIVE: The role of omega-3 polyunsaturated fatty acids (3PUFAs) on brain function is increasingly demonstrated. Here, the effect of dietary deprivation of essential 3PUFAs on some parameters related to neuroprotection was investigated.

METHODS: Rats were fed with two different diets: omega-3 diet and omega-3-deprived diet. To assess the influence of 3PUFAs on brain responses to ischemic insult, hippocampal slices were subjected to an oxygen and glucose deprivation (OGD) model of in vitro ischemia.

RESULTS: The omega-3-deprived group showed higher cell damage and stronger decrease in the [(3)H]glutamate uptake after OGD. Moreover, omega-3 deprivation influenced antiapoptotic cell response after OGD, affecting GSK-3beta and ERK1/2, but not Akt, phosphorylation.

CONCLUSION: Taken together, these results suggest that 3PUFAs are important for cell protection after ischemia and also seem to play an important role in the activation of antiapoptotic signaling pathways.

PMID: 19410444

