ABSTRACT

Effect of Omega 3 Fatty Acids in Jurkat cell Intracellular Signaling and the involvement of sphingolipids

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Omega-3 fatty acids can control leukocyte function such as cytokine production and lymphocyte proliferation. The positive effects of omega-3 fatty acid supplementation are related to beneficial effects on autoimmune and inflammatory disorders. In this study we evaluated if the inhibitory effect of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) on lymphocyte proliferation is related to ceramide *de novo* synthesis. The toxicity of DHA and EPA in the presence of 10 μM fumonisin B1 (FB1) in Jurkat cells (leukemic T cells) was determinate by flow cytometry; lymphocyte proliferation was evaluated by thymidine incorporation; protein phosphorylation by western-blotting and apoptotic related gene expression by real time PCR. DHA inhibited lymphocyte proliferation when added to the medium at concentrations above 25 μM, whereas EPA inhibited it already at 12,5 μM. DHA and EPA promoted an increase in DNA fragmentation above 25 μM. DHA and EPA promoted a decrease on JAK1, p42/44 and Akt phosphorylation. Consequently expression of the bax gene was increased by DHA and EPA and expression of the bcl-2 and bcl-xL was decreased. In the presence of FB1 all these effects were reverted. In conclusion, the inhibitory effects of DHA and EPA on Jurkat cell proliferation involve ceramide *de novo* synthesis leading to a decrease on JAK 1, p42/44 and Akt phosphorylation.

Word Keys: lymphocyte, DHA and EPA

Supported by: FAPESP and CNPq