Effect Of High-Fat Diets Enriched With Different Fatty Acids On Lymphocyte Proliferation

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INTRODUCTION: Lymphocyte activation plays an important role in several inflammatory diseases. High-fat diets rich in saturated and n-6 fatty acids are related to obesity development and immune system dysfunction.

OBJECTIVES: The aim of this study was to compare the effect of diets with different contents of total lipids and n-3 fatty acids on lymphocyte activation in C57BL/6 mice.

METHODS: C57/BL6 mice were fed with control diet (chow) or diets containing either fish oil at 4% (NF) and 40% (HF) or lard at 4% (NL) and 40% (HL) (wt/wt) for four weeks (n=29). Afterwards, lymphocytes were isolated from the mesenteric lymph nodes and cell proliferative capacity (BrDU incorporation), percentage of T regulatory (Treg) cells and phosphatidylserine externalization (PE) were evaluated by flow cytometry (BD FACS Aria II) and analyzed using BD-Diva software.

RESULTS AND DISCUSSION: Lymphocytes from HL group presented a higher percentage of cells in apoptosis when compared to NL (40.6% higher), NF (55.32%) and HF (36%) with p<0.05 for all comparison. Concanavalin A stimulated lymphocyte proliferation from NL groups was higher than chow, NF and HF groups (p<0.01 for all comparison). Lymphocyte proliferation from HL group was 73% higher than HF (p<0.001). HF group presented an increase in the percentage of Treg cells in relation to the other groups.

CONCLUSION: High fat diet with low content of omega-3 fatty acids leads to disruption of lymphocyte regulation characterized by a decrease of Treg cells and increase of stimulated lymphocyte proliferation. However, high fat diet enriched with fish oil promoted an increase on the percentage of Treg cells decreasing stimulated proliferation.

Keywords: Lymphocytes, lymph nodes, immune system, diets, fish oil, n-3, lard, inflammatory diseases.

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