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Efforts dedicated to finding the cure for obesity and associated disorders lead to an intense interest in adipocyte metabolism. The consumption of ω -3 fatty acids (FA) presents beneficial effects on changes caused by obesity. The aim of this study was to investigate the adipokines secretion of isolated adipocytes from obese mice induced by high fat (HF) diet, supplemented or not with fish oil (FO) [rich in ω -3 FA (EPA/DHA, 5:1)] with emphasis on the differential response of subcutaneous and visceral adipose deposits, inguinal (ING) and retroperitoneal (RP) regions, respectively. C57BL/6J mice received control (CO) or HF diet for eight weeks. Supplementation with FO (2 g/Kg p.c., 3 times/week) was initiated eight weeks after the induction of obesity, remaining until the end; totaling 16 weeks of experimental protocol. The white adipose tissue ING and RP were removed for isolation of adipocytes that were subjected to DMEM/10% FBS culture for 30 hours. At the end, adipokines concentrations in the culture supernatant were determined using specific ELISA kits. The adipocytes of the HF group showed a significant hypertrophy followed by an increase in the secretion of proinflammatory cytokines TNF- α and IL-6 compared to the CO group, whereas the HF+FO group presented total reversion of this effect, in both ING and RP adipocytes. There was no difference in secretion of adiponectin. The relevance of isolated adipocytes in the secretion of these cytokines is highlighted here. The adipocytes are affected by the HF diet and the FO has a protective effect on these parameters.

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