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Caloric restriction versus malnutrition: Modulation of inflammatory cytokines and renin-angiotensin system expression in adipose tissue

Deborah de Farias Lelis[1], Thales Pinheiro[1,2], João Marcus Andrade[1], Thaisa Pinheiro[2], Alanna Paraíso[1], Thaísa Crespo[1], Antônio Sérgio Barcala[1], Gislaine Jorge[1], Antônio Caldeira[1,2] and Sérgio Santos[1,2,3]

[1]Universidade Estadual de Montes Claros (Unimontes), Brazil
[2]Integrated Colleges Pythagorean of the Montes Claros (FIP), Brazil
[3]Universidade Federal de Minas Gerais (UFMG), Brazil

The increasing prevalence of obesity worldwide is of great importance since is considered a risk factor for cardiovascular diseases. The purpose of this study was to evaluate the metabolic profile, inflammatory markers and the renin-angiotensin system expression in the adipose tissue of mice subjected to different caloric restriction degrees and treated with standard and high-fat diet. Male Swiss mice were divided into eight groups and were fed for eight weeks with: G1: Standard Diet (ST) *ad libitum*; G2: ST+20% caloric restriction; G3: ST+40% caloric restriction; G4: ST+60% caloric restriction; G5: High-Fat Diet (HFD) *ad libitum*; G6: HFD+20% caloric restriction; G7: HFD+40% caloric restriction; G8: HFD+60% caloric restriction. Food intake, body weight, glycemic parameters, lipid profile and albumin were assessed. The weight of adipose tissues and the area of adipocytes from epididymal adipose tissue were analyzed. The expression of AGT, ACE, ACE-2, IL-6 e TNF-α epididymal adipose tissue was evaluated by PCR at real-time. The main findings showed a reduced body weight, improved glycemic and lipid profile, reduced albumin, decreased weights adipose tissues and reduced adipocyte size in epididymal adipose tissue. It was also noticed a reduced expression of mRNA of IL-6, TNF-α, AGT and ACE in the 20% and 40% treatment groups and an increase on its expression in the 60% caloric restriction groups. It was concluded that 20% and 40% of caloric restriction improved metabolism controlling the pro-inflammatory cytokines expression in mice, while a severe 60% caloric restriction produce a new pro-inflammatory profile with increased AGT and ACE expression.

dehlelisfarias@gmail.com