Metabolic syndrome and inflammation in adipose tissue occur at different times in animals submitted to a high-sugar/fat diet

Abstract
Obesity is associated with low-grade inflammation, triggered in adipose tissue, which may occur due to an excess of SFA from the diet that can be recognised by Toll-like receptor-4. This condition is involved in the development of components of the metabolic syndrome associated with obesity, especially insulin resistance. The aim of the study was to evaluate the manifestation of the metabolic syndrome and adipose tissue inflammation as a function of the period of time in which rats were submitted to a high-sugar/fat diet (HSF). Male Wistar rats were divided into six groups to receive the control diet (C) or the HSF for 6, 12 or 24 weeks. HSF increased the adiposity index in all HSF groups compared with the C group. HSF was associated with higher plasma TAG, glucose, insulin and leptin levels. Homeostasis model assessment increased in HSF compared with C rats at 24 weeks. Both TNF- and IL-6 were elevated in the epididymal adipose tissue of HSF rats at 24 weeks compared with HSF at 6 weeks and C at 24 weeks. Only the HSF group at 24 weeks showed increased expression of both Toll-like receptor-4 and NF-B. More inflammatory cells were found in the HSF group at 24 weeks. We can conclude that the metabolic syndrome occurs independently of the inflammatory response in adipose tissue and that inflammation is associated with hypertrophy of adipocytes, which varies according to duration of exposure to the HSF. (AU)