

Modulation of immune system cells from adipose tissue induced by exercise and caloric restriction in obese mice

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Abstract

During obesity establishment immune cells resident in adipose tissue become important as sources of pro-inflammatory mediators. Exercise and caloric restriction are important non-pharmacological tools against body mass increase and are poorly investigated concerning their effects on immune cells of adipose tissue in obese organisms, especially when a high fat diet is consumed. Thus, after a previous period of high fat diet consumption, mice were submitted to chronic swimming training or 30% caloric restriction in order to investigate the effect of both interventions on immune cells resident in adipose tissue. Our results demonstrated that both exercise and caloric restriction were able to reduce body mass in animals consuming high fat diet. However, in general, such strategies induced different changes in the numbers of immune cells resident in adipose tissue or in serum cytokines/chemokines produced by mice in a fat diet regimen. Specifically, exercise was able to increase NK number in adipose tissue and serum levels of IL-6 and RANTES while caloric restriction increased CD4/CD8 ratio and increased MCP-1 levels. Together, these data suggest that body mass reduction is not the only prerequisite to determine the effects of exercise or caloric restriction and reinforce the idea that the combination of both strategies is better than their single utilization. We also investigated the role of leptin in these parameters using the leptin deficient mice (ob/ob) after swimming protocol. We observed that exercise didn't affect the food intake, body weight as well as immune cells of adipose tissue in ob/ob mice, highlighting the leptin role in exercise and in adipose tissue inflammation.