

ABSTRACT (EN)

Low-carbohydrate diets are a debated topic in relation to athletic performance, overweight and obesity, but also to the health status of the individual. The impact on health and fitness is still ambiguous.

The aim of this study was to compare and investigate the effect of a low carbohydrate, in this case ketogenic, diet on body composition, sports performance at different exercise loads and levels of selected circulating cytokines.

Our study aimed to investigate the effects of a cyclic ketogenic reduction diet (CKD) vs. a nutritionally balanced reduction diet (RD) combined with regular resistance/aerobic training in healthy young men for 8 weeks.

Participants in both the CKD and RD groups reduced their body weight, body fat, and body mass index (BMI) values. In the CKD group, the amount of fat-free mass (net body weight) and the amount of water in the body decreased. In the RD group, however, the volume of these parameters did not change significantly. Muscle strength parameters were not affected in the CKD group, while maximal strength performances in chest pulldown and lower limb press increased in the RD group. Similarly, endurance performances were not affected in the CKD group, whereas maximal power output and maximal oxygen consumption increased in the RD group. Our findings suggest that equivalent weight loss was achieved in healthy young men undergoing resistance and aerobic training using different nutritional regimens, specifically CKD and RD. The CKD group also slightly reduced fat-free body weight. The results of the study further indicate that while CKD is effective in reducing body weight, it is not an effective method to improve anaerobic or aerobic performance in healthy young men. Furthermore, our results suggest that changes in osteonectin and musclin levels could contribute to improvements in muscle strength and endurance performance and partially explain the differential effects of CKD and RD on physical fitness.

In conclusion, diets that restrict dietary carbohydrates improve body composition, but athletic performance decreases significantly after 3-4 weeks. Increased musclin and lower osteonectin levels in healthy young men who perform resistance and aerobic exercise during RD could help to elucidate changes in increases in muscle strength and endurance performance and explain differences in physical fitness between CKD and RD.

KEYWORDS: low-carbohydrate diets, ketogenic diet, reduction diet, body composition, sports performance