

Low-Intensity Functional Training and Supplemental Astaxanthin Reduce Adipokine Levels and Cardiovascular Risk Factors in Obese Men

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Abstract

This study looked at how 12 weeks of high-intensity exercise with astaxanthin supplementation affected adipokine levels, insulin resistance, and lipid profiles in obese individuals. Four groups of seventeen individuals each were formed randomly from the sixty-eight obese males: the control group (CG), the supplement group (SG), the training group (TG), and the training plus supplement group (TSG). Participants received astaxanthin or a placebo for 12 weeks (20 mg/daily tablet). High-intensity functional training (HIFT) sessions lasted 60 minutes each, three times each week, for a total of 36 sessions. Adipokines (CTRP9 and CTRP2) levels, growth differentiation factors 8 and 15 (GDF8 and GDF15), metabolic profiles, body composition, anthropometric measurements, and cardio-respiratory indices were assessed.

Keywords: Migrant organizations • Networks • Social protection

Introduction

Obesity is linked to increased adipocyte size, increased reactive oxygen species (ROS) production, secretion of pro-inflammatory cytokines, and lipid deposition to promote insulin resistance in peripheral tissues. It also promotes co-morbid diseases such as cardiovascular diseases, type 2 diabetes, and metabolic syndrome. In addition to other proteins including Cq1/TNF-related proteins (CTRPs) and growth differentiation factors (GDFs), adipocytes also produce adiponectin, leptin, resistin, and visfatin into the bloodstream. Adipose tissue releases CTRPs that control lipid and glucose metabolism. The CTRP adipokine family has 15 members (CTRP-1 to CTRP-15), with localised tissue expression. Adipocytes are the primary tissue of high expression for CTRP-2 and CTRP-9. In both human and animal models of obesity, there is an increase in CTRP-2 and CTRP-9 secretion. Transforming growth factor (TGF)-family secretory proteins, including as GDF-8 and GDF-15, are known as GDFs. Myostatin, also known as GDF-8, is essential for maintaining the homeostasis of skeletal muscles, and studies have shown that GDF-8 expression levels are inversely correlated with fat loss, insulin sensitivity, and glucose absorption [1,2].

Methods

There were 101 participants who initially volunteered for the study after calling in public spaces like gyms, medical clinics, hospitals, and social networks. Of these, 33 were ruled ineligible, leaving 68 participants in the study (mean age: 27.6 8.4 yrs; mean height: 167.8 3.1 cm; mean weight: 94.7 2.0 kg; mean BMI: 33.6 1.4 kg/m²), who were split into 4 groups of 17 participants

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BMI > 30 kg/m², inactivity for the previous six months, absence of endocrine, metabolic, or cardiovascular illnesses, and abstinence from alcohol use were the inclusion criteria for the study. Participants with joint diseases or physical limitations as well as those taking supplements and drugs that can affect adipose and muscle tissue were also excluded from the study [3-5].

Discussion

We looked at how 12 weeks of HIFT combined with astaxanthin affected adipokine levels, insulin resistance, and lipid profiles in obese males. Our results show that 12 weeks of CrossFit exercise training combined with astaxanthin: (A) decreased anthropometric indices (body weight, BMI, FFM, and body fat percentage); (B) improved cardio-respiratory fitness (measured by VO₂peak); (C) improved lipid profiles (HDL-C, LDL-C, TC, and TGs); (D) improved post-test metabolic markers (glucose, insulin, and HOMA-IR). Increased adipocyte hypertrophy and hyperplasia are linked to obesity. Through the inhibition of mitochondrial -oxidation, AMPK activity, and the encouragement of lipogenesis, increased fat deposition by adipocytes is followed by these changes in lipolysis and lipogenesis [6].

Conclusion

The size and make-up of the networks—i.e., the different kinds of network partners that make them up—vary. However, in their day-to-day social protection-related activities, MOs are mostly connected to local actors, despite the fact that national institutions also play a significant but less prevalent role. Second, we found that governmental actors and welfare organisations were most crucial for social protection-related behaviours, whereas other organisations, including other MOs, played a modest role. This was done by concentrating on the relevance of the 15 MOs' network partners. Surprisingly, local network partners were far more significant than since MOs rely on them for financing and expertise, local government actors (such municipal integration centres) and welfare groups stood out as being particularly significant collaboration partners. However, not all organisations are equally respected in local hierarchies, and partnerships are not always marked by amicable cooperation; conflicts and unequal power dynamics between the network partners can undoubtedly occur.

Acknowledgement

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Conflict of Interest

None.

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