

# 有酸素運動トレーニングによるインスリン抵抗性の改善と アディポサイトカインの関連 — 運動トレーニングで血中アディポネクチンは増加するか？ —

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## Association between Exercise Training and Adipocytokine Release on Insulin Resistance

by

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### ABSTRACT

Adiponectin is an abundantly secreted adipocytokine that modulates various biological functions. The increase in plasma adiponectin that accompanies exercise training has been shown to play a significant protective role against insulin resistance, dyslipidemia, and atherosclerosis. However, a previous study demonstrated that moderate intensity exercise training increases insulin sensitivity, despite decreases in plasma adiponectin. This study investigates the association between exercise and blood adiponectin concentration in subjects with metabolic syndrome.

A total of 37 subjects were randomly assigned to an exercise or a diet group. The exercise group was instructed to perform exercise training for 300 min/wk at lactate threshold intensity. The diet group was instructed by a dietician to restrict energy intake using the following formula:  $\text{Height}^2 \text{ (m)} \times 22 \text{ (BMI)} \times 25 \text{ (kcal/d)}$ . Body composition, aerobic capacity, glucose and lipid metabolism were assessed in pre and post intervention for all subjects.

Body mass, fat mass, fat percentage, and visceral fat were reduced in both groups after intervention. Aerobic capacity was increased only in the exercise group. Lean body mass significantly decreased only in the diet group. Exercise training decreased HbA1c (JDS), and plasma glucose as indicated by a 2-h oral glucose tolerance test. HOMA-IR was significantly lower in post intervention compared to baseline in the diet group. However, blood adiponectin concentration was unchanged in both groups. Furthermore, high molecular adiponectin concentration was reduced in the exercise group.

This study suggests that exercise training improves glucose metabolism without an associated increase in plasma adiponectin.

## 要 旨

本研究の目的は運動による糖代謝能の改善に血中アディポネクチン濃度が関与するかを、メタボリックシンドロームと、その危険因子を有する者で調査することを目的とした。

対象者は運動群 12 名と食事群 15 名に無作為に割り当てられ、3 ヶ月間の介入に参加した。運動群は乳酸閾値強度の運動を週当たり 300 分実施するよう指導された。食事群は理想体重 (BMI 22 の体重)  $\times 25 \text{ (kcal)}$  を 1 日の摂取エネルギー量とした減量プログラムを実施した。

介入前後の比較の結果、運動群は血中アディポネクチン濃度に差を認めず、また高分子アディポネクチンが有意に低下したのにもかかわらず、HbA1c (JDS) と経口糖負荷試験の血糖 2 時間値が低下した。また食事群でも両サイトカインに有意な変化を認めなかったが HOMA-IR は低下した。

本研究は身体運動や食事制限による糖代謝の初期の改善効果に血中アディポネクチン濃度が強く影響する因子でない可能性を示した。