

【Review Article】

**Exercise Intervention and Energy Balance
- Is Exercise Beneficial for Weight Control ? -**

Miki Eto¹⁾, Kazunori Ohkawara^{2,3)}

Abstract

Exercise is one of the beneficial ways to reduce or manage weight. However, some studies have reported that actual weight reduction induced by exercise intervention was less than the expected amount. This phenomenon occurred more frequently in women subjects than men subjects. One of reasons for decreased actual weight reduction is energy compensation after exercise which is derived from decreased non-exercise activity thermogenesis (NEAT) and increased food intake. Several investigations reported that, when subjects started an exercise intervention, NEAT gradually decreased over several weeks, although other studies using a doubly labeled water method showed total energy expenditure, including exercise and NEAT components, did not decrease during exercise intervention. However, the magnitude of energy compensation through increased food intake seemed to be greater than that through decreased NEAT. It is reported that women especially showed energy compensation through increased food intake and that a high amount of instructed exercise was also a trigger for higher energy compensation. Furthermore, a medium-term exercise intervention resulted in the improvement of satiety response after meals, which may be related to changes in appetite hormones. However, there is large individual variability in energy compensation response which cannot be fully explained by known factors. Further studies are needed, including an approach from the field of brain science.

Key words: energy compensation, energy balance, exercise intervention, physical activity

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- 1) Doctoral Program in Sports Medicine, Graduate School of Comprehensive Human Sciences, University of Tsukuba, Ibaraki, Japan
 - 2) Faculty of Informatics and Engineering, University of Electro-Communications, Tokyo, Japan
 - 3) Department of Health Promotion and Exercise, National Institute of Health and Nutrition, Tokyo, Japan