

体脂肪燃焼効果を増強する衣服の開発

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Development of Clothes to Promote a Body Fat Burning Effect

by

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ABSTRACT

Aim: Physical exercise is important for limiting fat mass and preventing obesity. During the low temperature phase of the menstrual cycle, in women, aerobic exercise before lunch is effective in helping maintain lipid consumption. This study aimed to clarify the conditions under which body fat is easily consumed during aerobic exercise, which can be easily performed. We also aimed to clarify the effect of supported pants on consumption of body fat.

Methods: The subjects were eight young Japanese females aged 20s who were slightly a slender to obese one (BMI: 18.7-24.5). They woke at 06:00 after 7 hours of sleep and took the prescribed diet until 07:30. They then entered a climate-controlled room (24.5°C , 50.0%). Subjects were seated for one hour while wearing a short-sleeved 100% cotton t-shirt and one of the following: 100% polyester running pants

(A), basic pants with 80D yarn (B), 80D yarn pants with a partial modification of pressure with supporting material (C), or 110D yarn pants with the same design as C (D) made from the preliminary experiment. They then engaged in aerobic exercise with loads from 40% to 65% of the maximum heart rate and a total of 30 minutes exercise. Respiratory metabolism and heart rate were measured with a bicycle ergometer. The amount of energy/adipose/carbohydrate was calculated from RQs and oxygen intake.

Results/Findings/Conclusion: Total lipid consumption of aerobic exercise was reduced 12.2–16.1 times larger than control at rest. Body fat was reduced significantly larger (1.3 times) with C compared with A as control. C and D pants, which are partial compression garments, helped to reduce body fat more efficiently than A (non-compression garment) or B (constant compression garment). And if the same exercise intensity, the heart rate was controlled, but oxygen intake increased, it then was thought adipose consumption increased. Our findings show partial compression garments may be most effective in reducing body fat.

要 旨

肥満は生活習慣病などの様々な病気を引き起こす要因の一つであり、体脂肪を適切に保ちながら健康的な生活を送るためには、運動習慣を身につけることが重要である。本研究では有酸素運動下においてより脂肪を燃焼させる着圧パンツの開発を目的とした。被験者は20歳代女子8名で、呼吸代謝と心拍数を人工気象室(24.5℃, RH50%)内で測定した。半袖Tシャツに、4種類のパンツ(A:ポリエステル100%の無加圧, B:80Dのナイロンとポリウレタン糸の地編みの着圧ハーフパンツ, C:Bに部分加圧, D:Cと同デザインで110Dの地糸使用)を着用させた。エアロバイクを用いて有酸素運動を30分間与え、得られた呼吸商から消費エネルギー量(kcal/min)、糖質・脂質量(g/min)を求めた。また、静止時を基準にした相対脂質消費量は、A~Dの順に、12.3倍、12.2倍、16.1倍、14.2倍となり、かつAに比べCの消費量は1.3倍有意に多くなった。