女性の皮下脂肪量の季節変動に関する実態解析

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Analysis on the Seasonal Change of Subcutaneous Fat Mass in Women

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Abstract
Excess accumulation of body fat causes various health and aesthetic problems. However, systematic investigation of physiological variation of subcutaneous fat mass, seasonal variation in particular, has been insufficiently investigated. In this study, we investigated seasonal change of subcutaneous fat mass in women in their 20–30’s, using Magnetic Resonance Imaging (MRI) and ultrasonography B mode, in comparison with the visceral fat mass, energy intake, blood lipid level, and leptin level. In 13 healthy females (mean age: 29.3 years old) who maintained their conventional life-style, a dietary survey, measurements of physical profile and subcutaneous fat mass, and blood analysis were performed in September, January, April, and July. Body weight, percentage body fat, the subcutaneous fat mass and subcutaneous fat thickness of the abdomen were highest in January, and lowest in July. Their differences between values of two seasons were statistically significant. The visceral fat mass and the subcutaneous fat thickness of thigh changed similarly, but the visceral fat mass in July was higher than in September. Calorie intake was high in September and April, the serum triglyceride level was high in September, and the plasma leptin level reached peaks in July and September. These changes were not related to the changes of body weight and adipose tissue mass. In this research, the subcutaneous fat mass increased in fall to winter and decreased in spring to summer, and the seasonal change was similar to visceral fat and was more marked in abdominal portion. Based on these findings, there may be some systematic or local regulatory mechanism that maintains, increases or decreases adipose tissue mass according to seasonally changes in circumferences and life manner. Seasonal change of body appearance was not clear, but relationship between physiological changes of body shape and adipose tissue mass, and affecting factors could be revealed by investigations using more detailed form measurement technique and quantitative analysis of energy metabolism.

Key words: subcutaneous, fat, seasonal change, MRI, ultrasonography.

1．緒 言

真皮下に存在する皮下脂肪、ならびに腹腔内に存在する内臓脂肪は、おもに中性脂肪をその細胞内に蓄積した脂肪細胞が組織を構成している。これらを総じた体脂肪は体重の10～30%程度をも占め、環境や生理的変動に応じて組織量や分布、代謝や分泌等の機能が調節されていると考えられる。この脂肪組織が過形成することは健康や美容の点から種々の問題、たとえば高脂血症などの生活習慣病、容姿や体型の乱れを生じさせることから、その生理的実態、調節メカニズムについての解明が期待されている。一般的に女性においでは、内臓脂肪量に対する皮下脂肪量の比が男性に比べて大きく、思春期以降に腹部から下肢にかけて皮下脂肪の特微的な蓄積が生じる1)、2)，といった性差が知られる。また皮下脂肪量が日常生活で生理的に変動することは経験的に認知され、季節による変動現象、すなわち夏に比べて冬季で体脂肪量が増大するという報告がなされている3)、4)が、いずれも調査期間、計測手法等の点で不十分であり、これらの現象について科学的知見が十分に取得されているとはいえない。そこで本研究では、軽微に女性の皮下脂肪量を追跡調査し、年間を通しての変動を体系的に解析することを目的とした。ここでは20～30歳代女性を対象に各