肥満小児の体脂肪分布と生活習慣病リスクファクターに関する研究

三　重　大　学　　冨　樫　健　二
（共同研究者）国立三重病院　　増　田　英　成
同　　藤　沢　隆　夫
同　　神　谷　　齊
筑　波　大　学　　征　矢　英　昭

Distribution of Body Fat and Risk Factors for Chronic Diseases in Obese Children

by

Kenji Togashi
Department of Health & Physical Education, Faculty of Education, Mie University
Hidenari Masuda, Takao Fujisawa, Hitoshi Kamiya
Department of Pediatrics, Mie National Hospital
Hideaki Soya
Department of Exercise Biochemistry,
Institute of Health & Sports Science, University of Tsukuba

ABSTRACT

This study investigated the distribution of body fat in obese children as well as the relationship of fat distribution to risk factors for chronic diseases.

In 151 children with moderate to severe simple obesity（mean age 9.8 years, obesity index 45.8％）CT imaging at umbilical level was performed, then the areas of subcutaneous fat and visceral fat were calculated. The ratio of the area of visceral fat to that of subcutaneous fat was

designated as the V/S ratio. Blood was collected in the fasting state early in the morning, and lipid metabolism parameters such as TG, FFA, T-Cho, LDL-C, HDL-C and VLDL, liver function indices such as GOT, GPT and cholinesterase, and hormones associated with fat accumulation or degradation such as IRI, GH and cortisol were determined.

The mean areas of subcutaneous fat and visceral fat were 203.1 cm^2 and 42.6 cm^2, respectively, showing a V/S ratio of 0.21. Many risk factors for chronic diseases were correlated with subcutaneous fat, but correlations with visceral fat were weak. However, GOT, GPT, Apo A1, Apo A2 and cholinesterase showed stronger correlations with visceral fat. The V/S ratio was correlated solely with cholinesterase.

Obese children demonstrated the subcutaneous fat type of obesity even in cases of severe obesity. In adults, the risk for chronic diseases becomes higher with accumulation of visceral fat, while in children, the absolute amount of visceral fat is smaller, and therefore, subcutaneous fat showed a tendency toward closer association with risk factors for chronic diseases. However, some children demonstrated an absolute amount of visceral fat of more than 100 cm^2. In such children, early weight-reduction measures are required.

要　旨

肥満小児の体脂肪分布の実態を明らかにするとともに，脂肪分布と血中の生活習慣病危険因子との関連を検討した．

中～高度単純性肥満児童151名（平均年齢9.8歳，平均肥満度45.8％）を対象に臍高部CT画像撮影を行い，皮下脂肪面積と内臓脂肪面積を算出した．皮下／内臓脂肪面積比をＶ／Ｓ比とした．採血は早朝空腹時，もしくは随時採血で行い，トリグリセライド，FFA，総コレステロール，LDL-C，HDL-C，VLDLなどの脂質代謝関連指標，GOT，GPT，コリンエステラーゼなどの肝機能指標，痛風と関わる血清尿酸値，インスリン，成長ホルモン，コルチゾールなどの脂肪蓄積・分解に関わるホルモン等を定量した．

皮下・内臓脂肪面積の平均値はそれぞれ203.1cm^2，42.6cm^2であり，Ｖ／Ｓ比は0.21であった．各生活習慣病危険因子の多くは皮下脂肪と強く相関し，内臓脂肪との相関は皮下脂肪に比べ低かった．しかしながら，GOT，GPT，Apo A1，Apo A2，コリンエステラーゼに関しては内臓脂肪との相関の方が高かった．また，Ｖ／Ｓ比はコリンエステラーゼのみと相関が認められた．

小児肥満児は高度な肥満を呈していてもほとんどの者が皮下脂肪型であることが明らかとなった．成人では内臓脂肪の蓄積に伴い生活習慣病に対する危険度が高くなるが小児の場合，内臓脂肪の絶対量が少ないため生活習慣病危険因子との関連は皮下脂肪の方が強い傾向が認められた．しかし，内臓脂肪の絶対量が100cm^2を越える児童も認められ，早期の対応が必要であると思われた．