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LETTER

Subcutaneous to visceral fat ratio: a possible risk factor for metabolic syndrome and cardiovascular diseases

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Dear editor

We would like to comment, with great interest, about the recently published article "Visceral-to-subcutaneous fat ratio as a predictor of the multiple metabolic risk factors for subjects with normal waist circumference in Korea" by Oh et al,[1] which we found very interesting and valuable. This study is a good step to determine the predictive value of visceral-to-subcutaneous fat ratio (VSR) in persons with normal waist circumference for the diagnosis of risk factors for metabolic syndrome.

Metabolic syndrome is defined as a cluster of risk factors that occur together, resulting in a high risk of cardiovascular diseases, cerebrovascular events, and diabetes mellitus. At least three of the five main metabolic risk factors – abdominal obesity, high blood pressure, increased blood glucose level, increased serum triglycerides, and decreased high-density lipoprotein cholesterol – must be present in order to make a diagnosis of metabolic syndrome. According to the guidelines from National Heart, Lung and Blood Institute and American Heart Association, these risk factors are defined as following: abdominal obesity defined as a waist circumference ≥102 cm in men and ≥88 cm in women, blood pressure ≥130/85 mmHg, fasting blood sugar level ≥100 mg/dL, serum triglycerides 150 mg/dL or above, and high-density lipoprotein cholesterol ≤40 mg/dL and ≤50 mg/dL in men and women, respectively.[2]

Obesity is a heterogeneous condition, and regional distribution of fat is important to understand the role of obesity in disturbances of lipid and glucose metabolism. Adipose tissue, in obese patients, can accumulate in subcutaneous areas as well as visceral parts of abdomen. There are anatomical, physiological, clinical, and prognostic differences between subcutaneous and visceral fat. Visceral fat has been associated with greater risk of developing heart disease, cerebrovascular conditions, and diabetes compared to subcutaneous fat.[3]

In this cross-sectional study, the authors compared visceral fat area, subcutaneous fat area, and VSR in order to determine if VSR has any role in determining the metabolic risk factors in persons with normal waist circumference. The study results showed that VSR can predict the presence of nonadipose metabolic risk factors in men with normal waist circumference, but in the case of women, the results were nonsignificant with p-value >0.05.

We reviewed few other studies on association of VSR as a risk factor for metabolic syndrome and cardiovascular diseases which also show significant results. The study by Kaess et al[4] showed a significant correlation between the ratio of visceral adi-

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pose tissue to subcutaneous adipose tissue and cardiovascular diseases. Another study conducted in Japan concluded that there is a dose-dependent response between visceral fat area and risk for metabolic syndrome in normal weight population.[5]

We recommend that further studies should be conducted in order to consider VSR as an established risk factor for metabolic syndrome and cardiovascular diseases. Moreover, VSR may give worthwhile information for interventions to improve risk factors for metabolic syndromes and cardiovascular diseases.

Disclosure

The authors report no conflicts of interest in this communication.

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