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Abstract

Metabolic syndrome represents a constellation of metabolic derangements, including central obesity, glucose intolerance, hyperinsulinemia, low HDL-cholesterol, high triglycerides, and hypertension (1–6). Obesity is the main factor in the onset of metabolic syndrome, and, in particular, visceral obesity is considered to be important (7). BMI is a very popular measurement of body size because of its availability. However, BMI is an index calculated from only height and weight, and cannot evaluate fat distribution. In contrast, waist circumference is considered to represent fat distribution (7–11), and to evaluate visceral obesity more accurately than other indices, such as waist-to-hip ratio, etc. (12, 13, 14).

The purpose of this study is to clarify how much waist circumference adds to information about obesity when we have BMI data. The subjects of this study were 35 to 79 years of age residents of Okazaki City who had health check-up examinations at the Okazaki Public Health Center from February 2007 to August 2011. A total of 7,491 people agreed to participate in the research. Among 5,181 subjects who did not take medicine, 2,712 men and 2,469 women were analyzed. First, we observed the Pearson's coefficient between two obesity indices (BMI and waist circumference) and metabolic syndrome components, as well as R-squared of two models, BMI only and BMI plus waist circumference. We evaluated the significance of waist circumference by the change in these two R-squares. Adding a waist circumference to the base regression model using BMI does not affect the R-squared. The largest was 0.034 for triglycerides among women, followed by 0.018 for HDL-cholesterol among women. We did not observe any significance of

waist circumference measurements at the health checkup examinations. Waist circumference did not add obesity information related to metabolic syndrome as long as we have BMI data. In conclusion, we found no evidence for waist circumference measurement with BMI.