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Fat Distribution or Amount ; What is More Important?

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Obesity is a major risk factor of cardiovascular disease (CVD) risk assessment and management. The condition of obesity is heterogeneous as a phenotype. Many previous studies showed that the relationship between obesity and CVD depends not only on the amount but also on the distribution of body fat. Thus, we investigated the associations with body fat or body fat location determined Dual-energy X-ray Absorptiometry (DXA) anthropometry and subclinical atherosclerosis. This cross-sectional study enrolled 4046 participants without pre-existing CVD (1386 men, 2660 women; age 30–64 years) at the Cardiovascular and Metabolic Diseases Etiology Research Center. Regional adiposity (all z-score normalized) was acquired using a Lunar iDXA (GE Healthcare, Madison, WI, USA). The bilateral common carotid arteries were scanned using a high-resolution ultrasonographic system (LOGIQ S8, GE, Milwaukee, WI). Carotid atherosclerosis was defined as diffuse thickening of the carotid wall (carotid intima-media thickness $\geq 75\%$ tile). After adjustment for confounding

factors, body mass index (BMI), total fat, and visceral fat mass showed consistently increased risk of carotid atherosclerosis in both sexes. In particular, visceral fat mass had the highest area under the curve with risk of carotid atherosclerosis in both men (0.58; 95% confidence interval [CI], 0.55–0.62) and women (0.63; 95% CI, 0.61–0.66). In addition, after adjustment for total adiposity and confounding factors, gynoid fat showed protective effects for risk of carotid atherosclerosis in both men (odds ratio [OR], 0.67; 95% CI, 0.50–0.89) and women (OR, 0.86; 95% CI, 0.75–0.99). However, when we divided into 9 groups formed by combining tertiles of android fat and gynoid fat, in the group with the highest android fat, the odds ratio (95% CI) were for carotid atherosclerosis 1.49 (1.11–1.99) and 1.61 (1.26–2.05) in the middle and highest tertiles of gynoid fat, respectively, compared with the group with the lowest android fat and gynoid fat. In the group with the lowest android fat, there was not a statistically significant regardless of gynoid fat.