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Metabolically Healthy Obesity and Coronary Artery Calcification

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Background: There is a lack of consensus on a universally accepted standard for defining metabolic health (MH). Recently, a simple definition of MH was introduced based on anthropometric and metabolic parameters associated with CVD mortality in a prospective cohort study. We aimed to explore the relationship between the newly derived criteria of MH and coronary atherosclerosis using coronary artery calcification score (CACS), within Asian population.

Method: This cross-sectional study utilized health-checkup data from two university hospitals, involving 1,049 participants without a prior history of cardiovascular disease, who underwent CAC testing between January and December 2022. MH was defined as meeting the following criteria: (1) systolic blood pressure below 130 mm Hg and no use of blood pressure-lowering medication, (2) waist circumference < 90 cm for men and < 85 cm for women, and (3) absence of type 2 diabetes. Multivariate logistic regression was conducted to examine the odds ratio (OR) and 95% confidence interval (CI) of coronary calcification across different phenotypes.

Results: The prevalence of coronary calcification was 41.1%, and among all subjects, 7.9% were classified as having the metabolically healthy obesity (MHO) phenotype. In comparison to metabolically healthy normal weight (MHNW) subjects, individuals with MHO did not show an increased risk for coronary atherosclerosis (OR 0.93, 95% CI 0.48-1.79). Conversely, subjects classified as metabolically unhealthy had an increased risk compared to MHNW participants, regardless of their BMI category (OR 3.10, 95% CI 1.84-5.24 in metabolically unhealthy normal weight (MUHNW); OR 3.21, 95% CI 1.92-5.37 in metabolically unhealthy overweight (MUHOW); OR 2.73, 95% CI 1.72-4.33 in metabolically unhealthy obese (MUHO)).

Conclusions: These findings indicate that the new definition may effectively differentiate individuals at risk of cardiovascular disease from those who are not at risk within the Asian population.