

SUPPLEMENTARY METHODS

Anthropometric and body composition measurements

Height and weight were measured to one decimal place in cm and kg using an automatic device, with participants either barefoot or wearing only thin socks and clothing. Waist circumference (in cm) was measured at the mid-point between the last rib and the iliac crest with the tape kept horizontal, while participants stood upright. Hip circumference (in cm) was recorded by encircling the tape around the widest part of the buttocks, ensuring it remained horizontal.

Based on multi-frequency bioelectrical impedance analysis (MF-BIA; InBody 3.0, Biospace, Seoul, Korea), total skeletal muscle mass and body fat mass were measured. MF-BIA assumes that the human body consists of five interconnecting cylinders and measures the impedances of these body compartments directly. Impedances were measured at four specific frequencies (5, 50, 250, and 500 kHz), producing 20 impedance values for five body segments (trunk, right and left arms, and right and left legs) [1,2]. Weight-adjusted skeletal muscle index and percent body fat were calculated by dividing the skeletal muscle mass (kg) and body fat mass (kg) by the total body weight (kg), respectively. Fat-to-muscle ratio was determined by dividing body fat mass by total skeletal muscle mass.

Covariates

As features related to incident diabetes, the following covariates were considered; sex, age, education levels, physical activity, alcohol intake, current smoking status, total energy intake, dietary diversity score (DDS), and log-transformed C-reactive protein levels, and unweighted genetic risk score (GRS) at baseline.

A physically active person is someone who engages in more than 150 minutes of moderate-intensity activity per week or more than 75 minutes of vigorous-intensity activity per week. Individuals who were active but did not meet the above criteria were defined as moderately physically active, and individuals who reported no physical activity were defined as physically inactive [3]. Alcohol consumption was defined as non-drinkers, moderate drinkers, and heavy drinkers. Heavy drinkers are defined as those who drink more than 14 g/day for women

and more than 28 g/day for men. Subjects who drank alcohol but did not meet the above criteria were defined as moderate drinkers [3]. Data collected through a reliable dish-based semiquantitative food frequency questionnaire for 103 foods were used to calculate a DDS following the method used by Kim et al. [4]. One point was given to individuals who consumed each food group more than once a week. A total of 12 food groups (grains, chicken, processed meat, processed red meat [non-ruminant], processed red meat [ruminant], eggs, fish & seafood, legumes, nuts & seeds, vegetables, fruits, and milk) were evaluated, and the range is from 0 to 12 points, with higher numbers indicating that more diverse food groups were consumed. It was classified into three groups according to interquartile values. The community-based cohort provides genotyping data from the Illumina HumanExome BeadChip v1.1 (Illumina Inc., San Diego, CA, USA). We calculated an unweighted GRS based on 25 variants linked with glycosylated hemoglobin identified in genome-wide association studies in Asia. Each single nucleotide polymorphism was assigned 0, 1, or 2 according to the number of risk alleles and then summed. The calculated scores were divided into quartiles. Subjects with missing data were classified into the missing group.

SUPPLEMENTARY REFERENCES

1. Lee C, Kim HJ, Chang TI, Kang EW, Joo YS, Kim HW, et al. Synergic association of diabetes mellitus and chronic kidney disease with muscle loss and cachexia: results of a 16-year longitudinal follow-up of a community-based prospective cohort study. *Aging (Albany NY)* 2021;13:21941-61.
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3. Byrd DA, Judd SE, Flanders WD, Hartman TJ, Fedirko V, Bostick RM. Development and validation of novel dietary and lifestyle inflammation scores. *J Nutr* 2019;149:2206-18.
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