**Figure S1. The selection algorithm of study participants**

**Exclusion(n=48)**

Established Alzheimer disease

**Exclusion (n=6366)**

Missing data

**Enrolled in this study**

**(n=4578)**

**The original cohort of aged health examination participants**

**(n=10992)**

**Supplementary Table S1. The distribution of individual SPMSQ score level**

|  |  |  |
| --- | --- | --- |
| **SPMSQ Score** | **Number** | **Percentage (%)** |
| **0** | 4053 | 88.5 |
| **1** |  330 | 7.2 |
| **2** |  92 | 2.0 |
| **3** |  41 | 0.9 |
| **4** |  18 | 0.4 |
| **5** |  11 | 0.2 |
| **6** |  6 | 0.1 |
| **7** |  10 | 0.2 |
| **8** |  4 | 0.1 |
| **9** |  9 | 0.2 |
| **10** |  2 | 0.0 |
| **11** |  2 | 0.0 |

**Table S2. Demographic characteristics of study subjects (including 6366 participants excluded due to missing data)**

|  |  |
| --- | --- |
| 　 | **All participants(N=10944)** |
| **Age (years)** |  73.4 ± 6.2 |
| **Gender (male)** |  4094 (37.4%) |
| **Body height (cm)** |  156.0 ± 8.1 |
| **Body weight (kg)** |  60.0 ± 10.3 |
| **Body mass index (kg/m2)** |  24.6 ± 3.6 |
| **Systolic blood pressure (mmHg)** |  136.9 ± 19.9 |
| **Diastolic blood pressure (mmHg)** |  73.3 ± 11.4 |
| **Pulse rate (bpm)** |  74.7 ± 12.0 |
| **Waist circumference (cm)** |  83.8 ± 10.7 |
| **Hypertension (yes)** |  5255 (48.0%) |
| **Diabetes Mellitus (yes)** |  1873 (17.1%) |
| **Hyperlipidemia (yes)** |  1930 (17.6%) |
| **Depression (yes)** |  56(0.5%) |
| **Cardiovascular disease (yes)** |  1940(17.7%) |
| **Osteoporosis (yes)** |  101 (0.9%) |
| **Hyperthyroidism (yes)** |  70 (0.6%) |
| **Smoking in 6 months(yes)** |  632 (5.8%) |
| **Alcohol in 6 months(yes)** |  1566 (14.3%) |
| **Betel nut in 6 months(yes)** |  45 (0.4%) |
| **Exercise in 6 months(yes)** | 5894 (53.9%) |
| **AC sugar (mg/dL)** |  109.0 ± 28.3 |
| **Total protein (g/dL)** |  7.2 ± 0.5 |
| **Albumin (g/dL)** |  4.3± 0.3 |
| **GOT (U/L)** | 25.9 ± 17.7 |
| **GPT (U/L)** | 23.1 ± 19.8 |
| **Creatinine (mg/dL)** |  0.9 ± 0.5 |
| **Total cholesterol (mg/dL)** | 197.3 ± 36.7 |
| **Triglyceride (mg/dL)** | 122.0 ± 73.3 |
| **High density lipoprotein (mg/dL)** |  58.2 ± 16.1 |
| **Uric acid (mg/dL)** |  5.8 ± 1.5 |
| **Hemoglobin (g/dL)** | 13.2 ± 1.4 |
| **SPMSQ score (scores)** |  0.4 ± 1.4 |

The continuous variables were shown as mean ± SD; the categorical variables were shown as percentage.

Abbreviations: SPMSQ, Short Portable Mental Status Questionnaire

**Table S3. Comparisons of cognitive impairment group (SPMSQ≧3) and normal cognitive function group (SPMSQ<3) (including 6366 participants excluded due to missing data)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SPMSQ≧3 (N=359)** | **SPMSQ <3 (N=10585)** | ***P* value** |
| **Age (years)** |  80.1 ± 7.8 |  73.2 ± 6.0 | **<0.001** |
| **Gender (male)** |  94 (26.2%) |  4000 (37.8%) | **<0.001** |
| **Body height (cm)** |  151.2 ± 7.8 |  156.2 ± 8.1 | **<0.001** |
| **Body weight (kg)** |  55.1 ± 10.2 |  60.1 ± 10.3 | **<0.001** |
| **Body mass index (kg/m2)** |  24.0 ± 4.5 |  24.6 ± 3.6 |  **0.014** |
| **Systolic blood pressure (mmHg)** | 136.2 ± 22.6 | 136.9 ± 19.8 |  0.533 |
| **Diastolic blood pressure (mmHg)** |  72.4 ± 12.8 |  73.4 ± 11.3 |  0.118 |
| **Pulse rate (bpm)** |  77.7 ± 13.4 |  74.6 ± 11.9 |  **<0.001** |
| **Waist circumference (cm)** |  86.1 ± 12.2 |  83.8 ± 10.6 |  **<0.001** |
| **Hypertension (yes)** |  180 (50.1%) |  5057 (47.9%) |  0.413 |
| **Diabetes Mellitus (yes)** |  86 (24.0%) |  1787 (16.9%) |  **<0.001** |
| **Hyperlipidemia (yes)** |  37 (10.3%) |  1893 (17.9%) |  **<0.001** |
| **Depression (yes)** |  3 (0.8%) |  53 (0.5%) |  0.382 |
| **Cardiovascular disease (yes)** |  73 (20.3%) |  1867 (17.6%) |  0.188 |
| **Osteoporosis (yes)** |  2 (0.6%) |  99 (0.9%) |  0.461 |
| **Hyperthyroidism (yes)** |  0 (0%) |  70 (0.7%) |  0.122 |
| **Smoking in 6 months(yes)** |  15 (4.2%) |  617(5.8%) |  0.187 |
| **Alcohol in 6 months(yes)** |  16 (4.5%) |  1550 (14.6%) |  **<0.001** |
| **Betel nut in 6 months(yes)** |  1 (0.3%) |  44 (0.4%) |  0.690 |
| **Exercise in 6 months(yes)** |  86 (24.0%) |  5808 (54.9%) |  **<0.001** |
| **AC sugar (mg/dL)** | 112.1 ± 39.7 | 108.8 ± 27.9 |  0.120 |
| **Total protein (g/dL)** |  6.9 ± 0.6 |  7.2 ± 0.5 |  **<0.001** |
| **Albumin (g/dL)** |  4.1 ± 0.4 |  4.3 ± 0.3 |  **<0.001** |
| **GOT (U/L)** |  26.6 ± 21.1 |  25.9 ± 17.6 |  0.520 |
| **GPT (U/L)** |  21.6 ± 27.5 |  23.1 ± 19.5 |  0.165 |
| **Creatinine (mg/dL)** |  1.1 ± 0.6 |  0.9 ± 0.5 |  **<0.001** |
| **Total cholesterol (mg/dL)** | 188.9 ± 39.6 | 197.6 ± 36.6 |  **<0.001** |
| **Triglyceride (mg/dL)** | 127.6 ± 71.3 | 121.9 ± 73.4 |  0.145 |
| **High density lipoprotein (mg/dL)** |  51.0 ± 13.9 |  58.3 ± 16.1 |  **<0.001** |
| **Uric acid (mg/dL)** |  5.9 ± 1.9 |  5.8 ± 1.5 |  0.397 |
| **Hemoglobin (g/dL)** |  12.5 ± 1.6 |  13.2 ± 1.4 |  **<0.001** |

The continuous variables were shown as mean ± SD; the categorical variables were shown as percentage. Using chi-squared and t-test; Statistical significance was defined as *P*<0.05.

Abbreviations: SPMSQ, Short Portable Mental Status Questionnaire

**Table S4. Multivariate logistic regression of factors associated with cognitive impairment(SPMSQ≧3) (including 6366 participants excluded due to missing data)**

|  |  |  |
| --- | --- | --- |
|  | **Odds Ratio****Cognitive decline** **(SPMSQ≧3 )** | ***P* value** |
| **Age (years)** | 1.18 (1.13, 1.22)\* | <0.001 |
| **Gender (male)** | 0.48 (0.22, 1.02) |  0.055 |
| **Waist circumference (cm)** | 1.00 (0.98, 1.03) |  0.717 |
| **Diabetes Mellitus (yes)** | 1.52 (0.79, 2.90) |  0.208 |
| **Hyperlipidemia (yes)** | 0.59 (0.27, 1.31) |  0.197 |
| **Alcohol in 6 months(yes)** | 0.75 (0.22, 2.60) |  0.653 |
| **Exercise in 6 months(yes)** |  0.34 (0.25, 0.48)\* | <0.001 |
| **Albumin (g/dL)** |  0.26 (0.09, 0.72)\* |  0.010 |
| **High density lipoprotein (mg/dL)** |  0.97 (0.95, 0.99)\* |  0.005 |
| **Hemoglobin (g/dL)** | 1.06 (0.86, 1.30) |  0.614 |

Odds ratio (OR) and 95% confidence intervals (CIs) are shown after multivariate logistic regression.

\*Data are statistically significant (p < 0.05).

Abbreviations: SPMSQ, Short Portable Mental Status Questionnaire