

Association of uric acid with the decline in estimated glomerular filtration rate in middle-aged and elderly populations: evidence based on the China Health and Retirement Longitudinal Study

Supplemental Table 1. Baseline characteristics of participants included and excluded in the study

Characteristics	participants included			P-value
	participants included in baseline (n=7769)	in the baseline and excluded after follow-up (n=3231)	participants included in the study (n=4538)	
Demographic and biomarker indicators				
Age (years)	58 (52~65)	58 (52~66)	58 (52~64)	0.51
45~59	4370 (56.2)	1,797 (55.6)	2,573 (56.7)	0.34
60~	3399 (43.8)	1,434 (44.4)	1,965 (43.3)	
Female [n (%)]	4170 (53.7)	1676 (51.9)	2494 (55.0)	<0.01
Married with spouse [n (%)]	6490 (83.5)	2626 (81.3)	3864 (85.2)	<0.001
Education				
Middle school and below [n (%)]	5471 (70.4)	2248 (69.6)	3223 (71.0)	0.17
High school and above [n (%)]	2298 (29.6)	983 (30.4)	1315 (29.0)	
Ever drink [n (%)]	3032 (39.0)	1272 (39.4)	1760 (38.8)	0.60
Ever smoke [n (%)]	3010 (38.7)	1309 (40.5)	1701 (37.5)	<0.01
Rural region [n (%)]	5021 (64.6)	2009 (62.2)	3012 (66.4)	<0.001
Height (m)	1.58 (1.52~1.64)	1.58 (1.52~1.64)	1.58 (1.52~1.64)	0.72
Weight (kg)	57.8 (51.0~65.7)	57.3 (50.3~65.2)	58.2 (51.4~65.9)	<0.01
Waist (cm)	84.9 (78.0~92.0)	84.0 (77.4~91.2)	85.0 (78.6~92.3)	<0.01
Body mass index (kg/m ²)	23.1 (20.9~25.8)	22.9 (20.6~25.6)	23.3 (21.1~25.9)	<0.001
HGS (kg)	31.0 (25.0~39.0)	30.5 (24.5~39.0)	31.0 (25.0~39.0)	0.74
HGS group [n (%)]				
The low quarter of HGS	1955 (25.2)	882 (27.3)	1073 (23.6)	<0.001
The upper three quarters of HGS	5814 (74.8)	2349 (72.7)	3465 (76.4)	
Systolic blood pressure (mmHg)	126 (114~141)	127 (115~141)	126 (114~141)	0.19
Diastolic blood pressure (mmHg)	75 (67~83)	75 (67~83)	74 (67~83)	0.36
Blood examination				
WBCs (×10 ⁹ /L)	5.9 (5.0~7.2)	6.0 (5.0~7.3)	5.9 (5.0~7.2)	0.08
Hemoglobin (mg/dL)	14.2 (13.1~15.5)	14.2 (13.0~15.5)	14.3 (13.1~15.5)	0.82
Platelet (×10 ⁹ /L)	207 (163~254)	204 (160~251)	209 (164~257)	<0.01
Blood urea nitrogen (mg/dL)	15.0 (12.5~18.0)	15.0 (12.5~18.0)	14.9 (12.5~17.9)	0.23
Fasting glucose (mg/dL)	101.7 (94.5~110.2)	101.5 (94.3~110.5)	101.9 (94.9~109.8)	0.20
GHbA1c (%)	5.1 (4.9~5.4)	5.1 (4.9~5.4)	5.1 (4.9~5.4)	0.89
Total cholesterol (mg/dL)	191.0 (168.6~215.3)	191.0 (168.6~214.9)	191.6 (168.6~215.7)	0.35
Triglyceride (mg/dL)	102.7 (74.3~145.1)	101.8 (74.3~144.3)	103.5 (74.3~146.0)	0.36
HDL cholesterol (mg/dL)	49.5 (40.6~59.9)	50.0 (41.0~60.3)	49.1 (40.6~59.5)	0.12
LDL cholesterol (mg/dL)	115.2 (94.3~138.0)	115.2 (94.7~138.0)	115.6 (94.3~138.0)	0.71
hs-CRP (mg/L)	0.94 (0.55~1.74)	0.95 (0.56~1.75)	0.92 (0.54~1.73)	0.24
Uric acid (mg/dL)	4.3 (3.6~5.1)	4.4 (3.6~5.2)	4.2 (3.5~5.0)	<0.001
Q1	1937 (24.9)	733 (22.7)	1204 (26.5)	<0.001
Q2	1941 (25.0)	764 (23.6)	1177 (26.0)	

Q3	1947 (25.1)	862 (26.7)	1085 (23.9)	
Q4	1944 (25.0)	872 (27.0)	1072 (23.6)	
eGFR (mL/min/1.73m ²)	95.0 (85.1~102.5)	93.8 (83.5~102.0)	95.9 (86.3~102.7)	<0.001
60~89 mL/min/1.73m ²	2780 (35.8)	1272 (39.4)	1,508 (33.2)	<0.001
90~ mL/min/1.73m ²	4989 (64.2)	1959 (60.6)	3,030 (66.8)	
Disease states and corresponding medications				
Hypertension [<i>n</i> (%)]	3180 (40.9)	1303 (40.3)	1877 (41.4)	0.36
Antihypertensive therapy [<i>n</i> (%)]	1470 (18.9)	606 (18.8)	864 (19.0)	0.75
Diabetes mellitus [<i>n</i> (%)]	1256 (16.2)	540 (16.7)	716 (15.8)	0.27
Hypoglycemic therapy [<i>n</i> (%)]	267 (3.4)	114 (3.6)	153 (3.4)	0.74
Heart disease [<i>n</i> (%)]	892 (11.5)	358 (11.1)	534 (11.8)	0.35
Therapy for heart disease [<i>n</i> (%)]	543 (7.0)	220 (6.8)	323 (7.1)	0.60
Dyslipidemia [<i>n</i> (%)]	4702 (60.5)	1920 (59.4)	2782 (61.3)	0.10
Therapy for dyslipidemia [<i>n</i> (%)]	363 (4.7)	114 (3.5)	249 (5.5)	<0.001
Rheumatism [<i>n</i> (%)]	2653 (34.2)	1105 (34.2)	1548 (34.1)	0.94
Therapy for rheumatism [<i>n</i> (%)]	1021 (13.1)	399 (12.4)	622 (13.7)	0.08

Data are *n* (%) or median (interquartile range); HGS: handgrip strength; WBCs: white blood cell; GHbA1c: glycosylated hemoglobin A1c; HDL: high-density lipoprotein; LDL: low-density lipoprotein; hs-CRP: high-sensitivity C-reactive protein; eGFR: estimated glomerular filtration rate.

The Mann-Whitney U test was for continuous variables and χ^2 test was for categorical variables between Group 1 and Group 2 respectively.

Supplemental Table 2. Univariate analysis of variables between eGFR decline group and non-eGFR decline group

Variables	Coef.	95% Conf. Interval	<i>P</i> -value
Demographic and biomarker indicators			
Age (years)			
45~59	ref		
60~	0.808	0.659 to 0.957	<0.001
Sex			
Female	ref		
Male	0.200	0.053 to 0.347	0.01
Married with spouse [<i>n</i> (%)]	0.298	0.103 to 0.493	<0.01
Education			
Middle school and below [<i>n</i> (%)]	ref		
High school and above [<i>n</i> (%)]	-0.185	-0.351 to -0.019	0.03
Ever drink [<i>n</i> (%)]	0.058	-0.093 to 0.208	0.45
Ever smoke [<i>n</i> (%)]	0.156	0.006 to 0.306	0.04
Rural region [<i>n</i> (%)]	0.144	-0.014 to 0.302	0.07
Height (m)	-0.198	-1.083 to 0.688	0.66
Weight (kg)	-0.011	-0.018 to -0.004	<0.01
Waist (cm)	-0.005	-0.013 to 0.002	0.19
Body mass index (kg/m ²)	-0.036	-0.056 to -0.015	<0.01
HGS group			

The low quarter of HGS	ref		
The upper three quarters of HGS	-0.143	-0.308 to 0.022	0.09
Systolic blood pressure (mmHg)	0.008	0.005 to 0.012	<0.001
Diastolic blood pressure (mmHg)	0.001	-0.006 to 0.007	0.88
Blood examinations			
WBC ($10^9/L$)	0.014	-0.027 to 0.055	0.51
Hemoglobin (mg/dL)	-0.062	-0.099 to -0.024	<0.01
Platelet ($10^9/L$)	-0.001	-0.002 to 0.001	0.11
Blood urea nitrogen (mg/dL)	0.012	-0.005 to 0.030	0.16
Fasting glucose (mg/dL)	-0.004	-0.009 to 0.001	0.10
GHbA1c (%)	0.018	-0.151 to 0.187	0.83
eGFR group (mL/min/1.73m ²)			
60~89	ref		
90~	1.046	0.859 to 1.233	<0.001
Total cholesterol (mg/dL)	-0.002	-0.004 to -0.001	0.04
Triglyceride (mg/dL)	-0.001	-0.002 to -0.001	0.03
HDL cholesterol (mg/dL)	-0.001	-0.005 to 0.004	0.84
LDL cholesterol (mg/dL)	-0.002	-0.004 to 0.001	0.08
hs-CRP (mg/L)	0.037	-0.019 to 0.093	0.20
Uric acid (mg/dL)	0.046	-0.015 to 0.108	0.14
Uric acid group			
Q1	ref		
Q2	0.280	0.067 to 0.494	0.01
Q3	0.309	0.096 to 0.523	<0.01
Q4	0.281	0.068 to 0.495	0.01
Disease states and corresponding medications			
Hypertension [<i>n</i> (%)]	0.325	0.178 to 0.473	<0.001
Antihypertensive therapy [<i>n</i> (%)]	0.298	0.120 to 0.476	<0.01
Diabetes mellitus [<i>n</i> (%)]	-0.060	-0.264 to 0.144	0.56
Hypoglycemic therapy [<i>n</i> (%)]	0.007	-0.399 to 0.413	0.97
Heart disease [<i>n</i> (%)]	0.091	-0.132 to 0.314	0.43
Therapy for heart disease [<i>n</i> (%)]	0.259	-0.137 to 0.527	0.06
Dyslipidemia [<i>n</i> (%)]	0.264	-0.038 to 0.566	0.09
Therapy for dyslipidemia [<i>n</i> (%)]	-0.080	-0.230 to 0.07	0.30
Rheumatism [<i>n</i> (%)]	0.057	-0.097 to 0.211	0.47
Therapy for rheumatism [<i>n</i> (%)]	0.168	-0.038 to 0.374	0.11

HGS: handgrip strength; WBC: white blood cell; GHbA1c: glycosylated hemoglobin A1c; eGFR: estimated glomerular filtration rate; HDL: high density lipoprotein; LDL: low density lipoprotein; hs-CRP: high-sensitivity C-reactive protein.

The hand grip strength was grouped according to the interquartile range by sex. The lower quarter of the grip strength was group 1, and the upper three quarters were group 2. Serum uric acid is divided into Q1, Q2, Q3 and Q4 groups by one-quarter percentile.