

Supplemental information

Association between bilirubin and biomarkers of metabolic health and oxidative stress in the MARK-AGE cohort

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Supplemental Information

Table S1: Differences in biomarkers between UCB < 17.1 $\mu\text{mol/l}$ and UCB \geq 17.1 $\mu\text{mol/l}$, related to Table 2

Parameters	Total		UCB < 17 $\mu\text{mol/l}$		UCB \geq 17.1 $\mu\text{mol/l}$		p-Value
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
UCB ($\mu\text{mol/l}$)	2489	6.393 (3.61)	2442	6.107 (2.93)	47	21.24 (4.30)	<0.001
Age (years)	2489	58.49 (10.6)	2442	58.54 (10.6)	47	55.97 (11.4)	0.162
BMI (kg/m^2)	2489	26.31 (4.43)	2442	26.35 (4.44)	47	24.31 (3.23)	0.002
Weight (kg)	2489	75.15 (14.8)	2442	75.16 (14.8)	47	74.66 (16.7)	0.942
Height (cm)	2489	168.8 (9.41)	2442	168.7 (9.34)	47	174.2 (11.8)	<0.001
WC (cm)	2489	92.62 (12.5)	2442	92.69 (12.5)	47	89.04 (12.9)	0.103
WHR	2489	0.907 (0.08)	2442	0.907 (0.08)	47	0.907 (0.08)	0.861
Heart rate (bpm)	2489	70.18 (11.1)	2442	70.22 (11.1)	47	67.96 (12.0)	0.049
BP diastolic (mmHg)	2489	81.00 (11.0)	2442	80.99 (11.0)	47	81.36 (11.5)	0.754
BP systolic (mmHg)	2489	136.0 (20.1)	2442	136.0 (20.1)	47	134.1 (19.9)	0.412
Left hand power (kg)	2478	32.79 (10.8)	2432	32.70 (10.8)	46	37.63 (11.1)	0.003
Right hand power (kg)	2485	34.30 (11.1)	2438	34.22 (11.1)	47	38.81 (12.1)	0.005
HbA1c (%)	2470	6.043 (0.59)	2423	6.047 (0.60)	47	5.866 (0.40)	0.028
Insulin ($\mu\text{U/mL}$)	2487	6.128 (4.77)	2440	6.159 (4.80)	47	4.553 (2.20)	0.008
Triglycerides (mmol/l)	2326	1.271 (0.87)	2283	1.276 (0.87)	43	1.028 (0.50)	0.026
Cholesterol (mmol/l)	2327	5.609 (1.03)	2284	5.617 (1.03)	43	5.224 (0.90)	0.017
HDL Cholesterol (mmol/l)	2360	1.537 (0.44)	2317	1.537 (0.44)	43	1.532 (0.40)	0.924
LDL Cholesterol (mmol/l)	2361	3.331 (0.87)	2318	3.336 (0.87)	43	3.046 (0.82)	0.036
Adiponectin (ng/ml)	2487	14.35 (7.65)	2440	14.35 (7.66)	47	14.64 (7.44)	0.749
FRS (points)	2246	12.98 (4.17)	2208	13.02 (4.16)	38	10.68 (4.08)	0.002
ALT (U/l)	2487	24.18 (10.3)	2440	24.20 (10.3)	47	23.22 (7.36)	0.882
γ -GT (U/l)	2346	22.36 (28.0)	2304	22.33 (27.6)	42	24.28 (43.8)	0.925
Ascorbic acid (mg/l)	2489	5.177 (3.65)	2442	5.198 (3.67)	47	4.063 (2.75)	0.026
Uric acid (mg/l)	2489	45.45 (12.0)	2442	45.44 (12.0)	47	45.92 (12.6)	0.839
Glutathione ($\mu\text{mol/l}$)	2488	1107 (196)	2441	1106 (197)	47	1160 (168)	0.039
Cysteine ($\mu\text{mol/l}$)	2488	143.9 (33.4)	2441	144.1 (33.4)	47	131.0 (28.1)	0.008
MDA ($\mu\text{mol/l}$)	2489	0.322 (0.23)	2442	0.322 (0.23)	47	0.311 (0.17)	0.891
Protein carbonyls (nmol/mg)	2489	0.582 (0.10)	2442	0.581 (0.10)	47	0.601 (0.10)	0.25
3-Nitrotyrosine (pmol/mg)	2470	4.491 (2.80)	2423	4.494 (2.80)	47	4.313 (2.36)	0.953
Urinary 8-isoprostane (ng/ml)	2480	2.316 (2.32)	2434	2.322 (2.34)	46	1.984 (0.87)	0.343
Plasma creatinine ($\mu\text{mol/l}$)	2487	74.04 (15.9)	2440	73.96 (15.8)	47	78.49 (17.8)	0.039
Urinary creatinine (pmol/l)	2480	10.35 (5.83)	2434	10.32 (5.79)	46	11.90 (7.51)	0.229
CRP (mg/l)	2487	2.199 (3.27)	2440	2.210 (3.29)	47	1.590 (2.12)	0.055
Arg-Pyr (%)	2441	0.313 (0.78)	2394	0.312 (0.78)	47	0.356 (0.74)	0.334
CML (%)	2441	0.275 (0.80)	2394	0.274 (0.79)	47	0.329 (1.35)	0.126

Data are presented as mean \pm standard deviation. **Abbreviations:** UCB: unconjugated Bilirubin; RASIG: randomly recruited age-stratified individuals from the general population; GO: GEHA (genetics of healthy ageine) offspring; SGO: Spouses of GO (GEHA offspring); FRS: Framingham Risk Score; ALT: Alaninaminotransferase; γ -GT: Gamma glutamyl transferase; MDA: Malondialdehyde; CRP: C-reactive protein; Arg-Pyr: Arg-Pyrimidin; CML: Carboxymethyllysine.

Table S2: Biomarkers of the study population separated by sex, related to Table 3

Parameters	Total			Females		Males		p-Value
	n	Mean (SD)		n	Mean (SD)	n	Mean (SD)	
UCB (μmol/l)	2489	6.393 (3.61)	1361	5.814 (3.20)	1128	7.092 (3.93)	<0.001	
Age (years)	2489	58.49 (10.6)	1361	58.29 (10.5)	1128	58.73 (10.7)	0.248	
BMI (kg/m ²)	2489	26.31 (4.43)	1361	25.83 (4.86)	1128	26.90 (3.77)	<0.001	
Weight (kg)	2489	75.15 (14.8)	1361	68.48 (13.1)	1128	83.21 (12.6)	<0.001	
Height (cm)	2489	168.8 (9.41)	1361	162.9 (6.57)	1128	175.9 (7.18)	<0.001	
WC (cm)	2489	92.62 (12.5)	1361	88.76 (12.8)	1128	97.28 (10.4)	<0.001	
WHR	2489	0.907 (0.08)	1361	0.872 (0.07)	1128	0.948 (0.06)	<0.001	
Heart rate (bpm)	2489	70.18 (11.1)	1361	71.31 (10.2)	1128	68.81 (11.9)	<0.001	
BP diastolic (mmHg)	2489	81.00 (11.0)	1361	78.92 (10.6)	1128	83.51 (10.9)	<0.001	
BP systolic (mmHg)	2489	136.0 (20.1)	1361	132.3 (20.0)	1128	140.4 (19.3)	<0.001	
Left hand power (kg)	2478	32.79 (10.8)	1355	25.55 (5.70)	1123	41.52 (8.99)	<0.001	
Right hand power (kg)	2485	34.30 (11.1)	1359	27.14 (6.19)	1126	42.95 (9.42)	<0.001	
HbA1c (%)	2470	6.043 (0.59)	1352	6.073 (0.57)	1118	6.008 (0.61)	<0.001	
Insulin (μU/mL)	2487	6.128 (4.77)	1361	5.729 (4.46)	1126	6.611 (5.07)	<0.001	
Triglycerides (mmol/l)	2326	1.271 (0.87)	1297	1.150 (0.73)	1029	1.423 (0.99)	<0.001	
Cholesterol (mmol/l)	2327	5.609 (1.03)	1298	5.710 (1.02)	1029	5.483 (1.04)	<0.001	
HDL Cholesterol (mmol/l)	2360	1.537 (0.44)	1316	1.689 (0.44)	1044	1.344 (0.36)	<0.001	
LDL Cholesterol (mmol/l)	2361	3.331 (0.87)	1317	3.309 (0.87)	1044	3.359 (0.87)	0.074	
Adiponectin (ng/ml)	2487	14.35 (7.65)	1360	17.21 (8.01)	1127	10.90 (5.48)	<0.001	
FRS (points)	2246	12.98 (4.17)	1249	13.96 (4.54)	997	11.75 (3.26)	<0.001	
ALT (U/l)	2487	24.18 (10.3)	1361	21.72 (8.44)	1126	27.16 (11.4)	<0.001	
γ-GT (U/l)	2346	22.36 (28.0)	1304	17.25 (24.4)	1042	28.76 (30.7)	<0.001	
Ascorbic acid (mg/l)	2489	5.177 (3.65)	1361	5.756 (3.74)	1128	4.477 (3.42)	<0.001	
Uric acid (mg/l)	2489	45.45 (12.0)	1361	40.52 (10.0)	1128	51.39 (11.5)	<0.001	
Glutathione (μmol/l)	2488	1107 (196)	1360	1099 (191)	1128	1116 (202)	0.037	
Cysteine (μmol/l)	2488	143.9 (33.4)	1360	147.2 (33.1)	1128	139.9 (33.3)	<0.001	
MDA (μmol/l)	2489	0.322 (0.23)	1361	0.307 (0.21)	1128	0.339 (0.25)	<0.001	
Protein carbonyls (nmol/mg)	2489	0.582 (0.10)	1361	0.581 (0.09)	1128	0.582 (0.11)	0.819	
3-Nitrotyrosine (pmol/mg)	2470	4.491 (2.80)	1351	4.538 (2.84)	1119	4.434 (2.75)	0.424	
Urinary 8-isoprostane (ng/ml)	2480	2.316 (2.32)	1356	2.604 (2.41)	1124	1.969 (2.15)	<0.001	
Plasma creatinine (μmol/l)	2487	74.04 (15.9)	1361	66.58 (12.2)	1126	83.06 (15.1)	<0.001	
Urinary creatinine (pmol/l)	2480	10.35 (5.83)	1356	8.751 (5.26)	1124	12.28 (5.89)	<0.001	
CRP (mg/l)	2487	2.199 (3.27)	1361	2.214 (3.22)	1126	2.180 (3.33)	0.496	
Arg-Pyr (%)	2441	0.313 (0.78)	1331	0.315 (0.87)	1110	0.312 (0.65)	0.624	
CML (%)	2441	0.275 (0.80)	1331	0.264 (0.73)	1110	0.288 (0.88)	0.502	

Data are presented as mean ± standard deviation. **Abbreviations:** UCB: unconjugated Bilirubin; RASIG: randomly recruited age-stratified individuals from the general population; GO: GEHA (genetics of healthy ageine) offspring; SGO: Spouses of GO (GEHA offspring); FRS: Framingham Risk Score; ALT: Alaninaminotransferase; γ-GT: Gamma glutamyl transferase; MDA: Malondialdehyde; CRP: C-reactive protein; Arg-Pyr: Arg-Pyrimidin; CML: Carboxymethyllysine.

Table S3: Biomarkers of the UCB subgroups separated by sex, related to Table 3

Parameter	Class 1 (N = 248)					Class 10 (N = 248)				
	Females (0)		Males (1)		p-Value	Females (0)		Males (1)		p-Value
	n	Mean (SD)	n	Mean (SD)		n	Mean (SD)	n	Mean (SD)	
UCB (μmol/l)	156	2.499 (0.39)	92	2.434 (0.49)	0.627	91	14.46 (4.23)	157	14.71 (3.91)	0.289
Age (years)	156	58.31 (10.6)	92	57.94 (10.4)	0.629	91	56.54 (12.2)	157	59.09 (11.1)	0.121
BMI (kg/m ²)	156	26.30 (5.38)	92	28.50 (4.48)	<0.001	91	24.40 (4.58)	157	26.40 (3.79)	<0.001
Weight (kg)	156	68.57 (14.0)	92	86.39 (13.6)	<0.001	91	65.35 (13.2)	157	82.34 (12.6)	<0.001
Height (cm)	156	161.6 (6.12)	92	174.2 (6.21)	<0.001	91	163.5 (6.73)	157	176.6 (7.70)	<0.001
WC (cm)	156	90.21 (13.7)	92	100.7 (10.7)	<0.001	91	86.53 (12.8)	157	96.17 (10.3)	<0.001
WHR	156	0.881 (0.07)	92	0.954 (0.05)	<0.001	91	0.864 (0.07)	157	0.948 (0.06)	<0.001
Heart rate (bpm)	156	72.97 (9.99)	92	73.20 (12.5)	0.965	91	70.88 (9.56)	157	67.19 (12.0)	0.002
BP diastolic (mmHg)	156	80.69 (10.0)	92	83.29 (11.8)	0.145	91	77.24 (9.60)	157	83.59 (10.2)	<0.001
BP systolic (mmHg)	156	134.5 (21.1)	92	140.4 (20.5)	0.031	91	129.0 (19.1)	157	140.9 (19.9)	<0.001
Left hand power (kg)	154	24.86 (5.11)	90	42.51 (8.76)	<0.001	90	26.73 (7.18)	157	41.36 (8.55)	<0.001
Right hand power (kg)	156	26.40 (5.51)	92	43.12 (9.54)	<0.001	91	28.49 (7.77)	157	42.62 (8.76)	<0.001
HbA1c (%)	154	6.142 (0.80)	89	6.135 (0.59)	0.687	90	5.984 (0.42)	155	5.880 (0.51)	0.048
Insulin (μU/mL)	156	6.288 (5.01)	91	9.418 (7.06)	<0.001	91	4.516 (2.22)	157	5.332 (3.11)	0.063
Triglycerides (mmol/l)	147	1.211 (1.04)	86	1.941 (1.79)	<0.001	84	0.950 (0.39)	144	1.203 (0.63)	0.002
Cholesterol (mmol/l)	147	5.677 (0.97)	86	5.472 (0.94)	0.059	84	5.577 (1.02)	144	5.259 (1.05)	0.028
HDL Cholesterol (mmol/l)	149	1.595 (0.45)	88	1.181 (0.33)	<0.001	86	1.785 (0.45)	145	1.375 (0.35)	<0.001
LDL Cholesterol (mmol/l)	149	3.363 (0.85)	88	3.444 (0.81)	0.424	86	3.140 (0.90)	145	3.170 (0.88)	0.476
Adiponectin (ng/ml)	156	17.33 (9.39)	92	9.811 (4.44)	<0.001	91	19.24 (8.65)	156	11.90 (6.18)	<0.001
FRS (points)	140	14.74 (3.78)	80	12.46 (2.84)	<0.001	77	12.71 (5.50)	134	11.13 (3.81)	0.005
ALT (U/l)	156	21.70 (9.30)	91	27.10 (11.3)	<0.001	91	20.45 (5.94)	157	25.46 (10.1)	<0.001
γ-GT (U/l)	148	20.57 (36.8)	88	30.87 (25.9)	<0.001	83	16.33 (18.6)	145	24.75 (30.4)	<0.001
Ascorbic acid (mg/l)	156	5.848 (3.56)	92	5.208 (6.99)	0.002	91	5.235 (3.06)	157	4.367 (2.77)	0.03
Uric acid (mg/l)	156	38.87 (10.2)	92	51.81 (10.7)	<0.001	91	39.22 (10.8)	157	51.11 (11.4)	<0.001
Glutathione (μmol/l)	156	1085 (168)	92	1101 (229)	0.461	91	1119 (200)	157	1142 (203)	0.345
Cysteine (μmol/l)	156	145.9 (35.9)	92	139.5 (42.5)	0.078	91	143.2 (29.8)	157	135.5 (31.3)	0.094
MDA (μmol/l)	156	0.295 (0.20)	92	0.340 (0.25)	0.326	91	0.319 (0.21)	157	0.324 (0.19)	0.756
Protein carbonyls (nmol/mg)	156	0.581 (0.09)	92	0.605 (0.25)	0.868	91	0.589 (0.08)	157	0.587 (0.08)	0.924
3-Nitrotyrosine (pmol/mg)	153	4.699 (3.34)	89	4.368 (2.41)	0.911	90	4.604 (2.32)	156	4.252 (2.42)	0.156
Urinary 8-isoprostane (ng/ml)	155	3.119 (3.04)	91	2.512 (4.25)	<0.001	91	2.578 (1.84)	156	1.749 (0.74)	<0.001
Plasma creatinine (μmol/l)	156	63.17 (11.7)	91	82.91 (22.1)	<0.001	91	67.28 (12.7)	157	84.94 (13.0)	<0.001
Urinary creatinine (pmol/l)	155	8.043 (4.39)	91	12.37 (6.26)	<0.001	91	9.143 (5.53)	156	12.50 (6.05)	<0.001
CRP (mg/l)	156	2.245 (2.60)	91	3.383 (4.00)	0.017	91	2.046 (3.73)	157	2.102 (4.22)	0.384
Arg-Pyr (%)	150	0.252 (0.42)	92	0.272 (0.21)	0.018	89	0.554 (1.98)	153	0.317 (0.58)	0.808
CML (%)	150	0.209 (0.53)	92	0.162 (0.15)	0.764	89	0.166 (0.40)	153	0.303 (1.05)	0.187

Data are presented as mean ± standard deviation. **Abbreviations:** UCB: unconjugated Bilirubin; RASIG: randomly recruited age-stratified individuals from the general population; GO: GEHA (genetics of healthy age) offspring; SGO: Spouses of GO (GEHA offspring); FRS: Framingham Risk Score; ALT: Alaninaminotransferase; γ-GT: Gamma glutamyl transferase; MDA: Malondialdehyde; CRP: C-reactive protein; Arg-Pyr: Arg-Pyrimidin; CML: Carboxymethyllysine.

Table S4: Biomarkers of the study population separated by age (cut-off 50 years), related to Table 4

Parameters	Total		Age < 50 years		Age ≥ 50 years		p-Value
	n	Mean (SD)	n	Mean (SD)	n	Mean (SD)	
UCB (μmol/l)	2489	6.393 (3.61)	569	6.776 (3.98)	1920	6.280 (3.48)	0.015
Age (years)	2489	58.49 (10.6)	569	42.75 (4.48)	1920	63.15 (6.66)	<0.001
BMI (kg/m ²)	2489	26.31 (4.43)	569	24.99 (3.94)	1920	26.71 (4.49)	<0.001
Weight (kg)	2489	75.15 (14.8)	569	73.73 (15.0)	1920	75.57 (14.7)	0.011
Height (cm)	2489	168.8 (9.41)	569	171.3 (9.81)	1920	168.0 (9.16)	<0.001
WC (cm)	2489	92.62 (12.5)	569	87.96 (12.0)	1920	94.00 (12.4)	<0.001
WHR	2489	0.907 (0.08)	569	0.882 (0.08)	1920	0.914 (0.08)	<0.001
Heart rate (bpm)	2489	70.18 (11.1)	569	70.51 (11.4)	1920	70.08 (11.0)	0.258
BP diastolic (mmHg)	2489	81.00 (11.0)	569	78.08 (10.9)	1920	81.86 (10.9)	<0.001
BP systolic (mmHg)	2489	136.0 (20.1)	569	125.8 (16.4)	1920	139.0 (20.0)	<0.001
Left hand power (kg)	2478	32.79 (10.8)	569	36.01 (10.8)	1909	31.83 (10.7)	<0.001
Right hand power (kg)	2485	34.30 (11.1)	569	37.23 (11.1)	1916	33.43 (11.0)	<0.001
HbA1c (%)	2470	6.043 (0.59)	566	5.884 (0.44)	1904	6.091 (0.62)	<0.001
Insulin (μU/mL)	2487	6.128 (4.77)	569	5.597 (4.51)	1918	6.286 (4.83)	<0.001
Triglycerides (mmol/l)	2326	1.271 (0.87)	527	1.188 (0.88)	1799	1.295 (0.86)	<0.001
Cholesterol (mmol/l)	2327	5.609 (1.03)	527	5.380 (0.93)	1800	5.677 (1.05)	<0.001
HDL Cholesterol (mmol/l)	2360	1.537 (0.44)	542	1.497 (0.42)	1818	1.548 (0.44)	0.023
LDL Cholesterol (mmol/l)	2361	3.331 (0.87)	542	3.179 (0.82)	1819	3.376 (0.88)	<0.001
Adiponectin (ng/ml)	2487	14.35 (7.65)	569	12.88 (6.36)	1918	14.79 (7.94)	<0.001
FRS (points)	2246	12.98 (4.17)	511	8.249 (4.37)	1735	14.37 (2.89)	<0.001
ALT (U/l)	2487	24.18 (10.3)	569	24.03 (11.2)	1918	24.22 (9.97)	0.011
γ-GT (U/l)	2346	22.36 (28.0)	533	19.80 (29.3)	1813	23.11 (27.5)	<0.001
Ascorbic acid (mg/l)	2489	5.177 (3.65)	569	4.848 (3.17)	1920	5.274 (3.78)	0.028
Uric acid (mg/l)	2489	45.45 (12.0)	569	43.13 (11.7)	1920	46.14 (12.0)	<0.001
Glutathione (μmol/l)	2488	1107 (196)	568	1105 (192)	1920	1107 (197)	0.998
Cysteine (μmol/l)	2488	143.9 (33.4)	568	132.1 (29.9)	1920	147.4 (33.5)	<0.001
MDA (μmol/l)	2489	0.322 (0.23)	569	0.299 (0.20)	1920	0.328 (0.24)	0.026
Protein carbonyls (nmol/mg)	2489	0.582 (0.10)	569	0.587 (0.13)	1920	0.580 (0.09)	0.538
3-Nitrotyrosine (pmol/mg)	2470	4.491 (2.80)	568	4.586 (2.99)	1902	4.462 (2.74)	0.691
Urinary 8-isoprostane (ng/ml)	2480	2.316 (2.32)	568	2.017 (1.57)	1912	2.405 (2.49)	<0.001
Plasma creatinine (μmol/l)	2487	74.04 (15.9)	569	73.05 (14.3)	1918	74.34 (16.3)	0.27
Urinary creatinine (pmol/l)	2480	10.35 (5.83)	568	11.44 (6.73)	1912	10.03 (5.49)	<0.001
CRP (mg/l)	2487	2.199 (3.27)	569	1.809 (2.86)	1918	2.314 (3.37)	<0.001
Arg-Pyr (%)	2441	0.313 (0.78)	564	0.314 (0.90)	1877	0.313 (0.74)	0.312
CML (%)	2441	0.275 (0.80)	564	0.227 (0.60)	1877	0.289 (0.85)	0.011

Data are presented as mean ± standard deviation. **Abbreviations:** UCB: unconjugated Bilirubin; RASIG: randomly recruited age-stratified individuals from the general population; GO: GEHA (genetics of healthy age) offspring; SGO: Spouses of GO (GEHA offspring); FRS: Framingham Risk Score; ALT: Alaninaminotransferase; γ-GT: Gamma glutamyl transferase; MDA: Malondialdehyde; CRP: C-reactive protein; Arg-Pyr: Arg-Pyrimidin; CML: Carboxymethyllysine.

Table S5: Biomarkers of the UCB subgroups separated by age (cut-off 50 years), related to Table 4

Parameter	Class 1 (N = 248)					Class 10 (N = 248)					p-Value
	Age < 50 years		Age ≥ 50 years		p-Value	Age < 50 years		Age ≥ 50 years		p-Value	
	N	Mean (SD)	N	Mean (SD)		N	Mean (SD)	N	Mean (SD)		
UCB (μmol/l)	58	2.434 (0.48)	190	2.488 (0.41)	0.774	72	14.91 (4.17)	176	14.50 (3.96)	0.549	
Age (years)	58	43.06 (4.54)	190	62.79 (6.77)	<0.001	72	42.70 (4.20)	176	64.48 (6.57)	<0.001	
BMI (kg/m ²)	58	25.95 (4.42)	190	27.47 (5.33)	0.066	72	24.11 (3.71)	176	26.30 (4.23)	<0.001	
Weight (kg)	58	73.17 (16.9)	190	75.79 (16.1)	0.239	72	73.32 (15.8)	176	77.24 (14.9)	0.045	
Height (cm)	58	167.2 (9.15)	190	166.0 (8.50)	0.602	72	173.7 (10.2)	176	171.1 (9.40)	0.087	
WC (cm)	58	89.53 (13.1)	190	95.47 (13.5)	0.003	72	87.18 (11.6)	176	94.86 (11.7)	<0.001	
WHR	58	0.886 (0.08)	190	0.915 (0.07)	0.006	72	0.885 (0.07)	176	0.931 (0.07)	<0.001	
Heart rate (bpm)	58	75.57 (10.6)	190	72.28 (11.0)	0.035	72	67.75 (12.2)	176	68.87 (10.9)	0.366	
BP diastolic (mmHg)	58	80.59 (11.5)	190	81.98 (10.5)	0.242	72	76.29 (8.77)	176	83.30 (10.3)	<0.001	
BP systolic (mmHg)	58	126.3 (16.6)	190	139.8 (21.3)	<0.001	72	124.3 (13.9)	176	141.5 (20.6)	<0.001	
Left hand power (kg)	58	34.84 (10.5)	186	30.28 (10.7)	0.002	72	38.50 (10.2)	175	35.01 (10.8)	0.025	
Right hand power (kg)	58	36.12 (10.6)	190	31.53 (10.7)	<0.001	72	40.01 (11.1)	176	36.39 (10.6)	0.049	
HbA1c (%)	58	5.979 (0.45)	185	6.189 (0.80)	0.073	72	5.848 (0.41)	173	5.948 (0.50)	0.218	
Insulin (μU/mL)	58	7.093 (5.67)	189	7.548 (6.15)	0.618	72	4.696 (2.65)	176	5.171 (2.91)	0.22	
Triglycerides (mmol/l)	55	1.582 (1.67)	178	1.449 (1.32)	0.735	67	0.988 (0.60)	161	1.160 (0.54)	<0.001	
Cholesterol (mmol/l)	55	5.492 (1.06)	178	5.635 (0.93)	0.333	67	5.216 (0.82)	161	5.443 (1.13)	0.145	
HDL Cholesterol (mmol/l)	57	1.373 (0.44)	180	1.463 (0.46)	0.133	68	1.507 (0.34)	163	1.536 (0.47)	0.978	
LDL Cholesterol (mmol/l)	57	3.344 (0.90)	180	3.409 (0.82)	0.395	68	3.061 (0.77)	163	3.199 (0.93)	0.229	
Adiponectin (ng/ml)	58	12.94 (8.52)	190	15.03 (8.73)	0.02	72	13.16 (5.86)	175	15.20 (8.68)	0.18	
FRS (points)	53	10.70 (3.97)	167	14.93 (2.85)	<0.001	61	6.660 (4.08)	150	13.77 (2.79)	<0.001	
ALT (U/l)	58	23.12 (10.9)	189	23.87 (10.3)	0.455	72	23.06 (9.11)	176	23.85 (9.14)	0.314	
γ-GT (U/l)	56	25.72 (38.2)	180	24.00 (31.9)	0.786	65	15.73 (14.9)	163	24.06 (30.2)	0.006	
Ascorbic acid (mg/l)	58	5.354 (3.95)	190	5.689 (5.41)	0.757	72	4.692 (2.86)	176	4.682 (2.94)	0.891	
Uric acid (mg/l)	58	42.27 (13.6)	190	44.10 (11.6)	0.234	72	44.13 (13.6)	176	47.82 (12.0)	0.012	
Glutathione (μmol/l)	58	1065 (225)	190	1099 (181)	0.294	72	1104 (176)	176	1146 (210)	0.147	
Cysteine (μmol/l)	58	123.1 (33.7)	190	149.7 (37.8)	<0.001	72	126.7 (27.1)	176	143.0 (31.1)	<0.001	
MDA (μmol/l)	58	0.292 (0.20)	190	0.318 (0.23)	0.526	72	0.287 (0.19)	176	0.336 (0.20)	0.047	
Protein carbonyls (nmol/mg)	58	0.596 (0.30)	190	0.588 (0.10)	0.066	72	0.595 (0.09)	176	0.585 (0.08)	0.485	
3-Nitrotyrosine (pmol/mg)	57	4.493 (2.45)	185	4.603 (3.19)	0.567	72	4.532 (2.67)	174	4.319 (2.26)	0.52	
Urinary 8-isoprostane (ng/ml)	58	2.064 (0.85)	188	3.151 (3.98)	0.064	72	2.042 (1.02)	175	2.060 (1.43)	0.933	
Plasma creatinine (μmol/l)	58	66.67 (13.8)	189	71.60 (20.0)	0.151	72	78.39 (14.2)	176	78.49 (16.0)	0.792	
Urinary creatinine (pmol/l)	58	10.43 (5.94)	188	9.402 (5.43)	0.261	72	11.86 (6.50)	175	11.02 (5.89)	0.305	
CRP (mg/l)	58	1.996 (2.27)	189	2.870 (3.45)	0.158	72	1.827 (4.36)	176	2.186 (3.91)	<0.001	
Arg-Pyr (%)	58	0.280 (0.62)	184	0.253 (0.21)	0.201	71	0.288 (0.39)	171	0.452 (1.51)	0.319	
CML (%)	58	0.155 (0.14)	184	0.203 (0.49)	0.557	71	0.188 (0.46)	171	0.280 (0.99)	0.021	

Data are presented as mean ± standard deviation. **Abbreviations:** UCB: unconjugated Bilirubin; RASIG: randomly recruited age-stratified individuals from the general population; GO: GEHA (genetics of healthy age) offspring; SGO: Spouses of GO (GEHA offspring); FRS: Framingham Risk Score; ALT: Alaninaminotransferase; γ-GT: Gamma glutamyl transferase; MDA: Malondialdehyde; CRP: C-reactive protein; Arg-Pyr: Arg-Pyrimidin; CML: Carboxymethyllysine.