S u p p l e m e n t a r y m a t e r i a l

Circulating thyroid hormones and clinical parameters of heart failure in men

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Supplementary Table S1. Correlations between thyroid hormones.

	TT_3 [nmol/L]		fT_3 [pmol/L]		fT_4 [pmol/L]		TT_4 [nmol/L]	
	r †	*p*	*r*	*p*	*r*	*p*	*r*	*p*
fT_3 [pmol/L]	0.134	0.050						
fT_4 [pmol/L]	0.162	0.017*	0.374	<0.001*				
TT_4 [nmol/L]	0.266	<0.001*	0.598	<0.001*	0.625	<0.001*		
TSH [mIU/L]	-0.093	0.174	-0.069	0.316	-0.202	<0.001*	-0.176	0.010*

* Statistically significant ($p<0.05$).

† Pearson's coefficient.

The normality of data distribution was tested using the Kolmogorov-Smirnov test.

TT_3: total triiodothyronine, fT_3: free triiodothyronine, fT_4: free thyroxine, TT_4: total thyroxine, TSH: thyroid stimulating hormone.

Supplementary Table S2. Multiple regression analysis for the predicting association of TT_3 levels and other clinical factors with NYHA class.

	β †	p ‡
Predictors		
Age (years)	0.069	0.365
BMI (kg/m^2)	-0.008	0.915
Total T_3	-0.042	0.603
Total testosterone (nmol/L)	-0.014	0.847
Glomerular filtration rate (ml/min/1.73m^2)	-0.314	<0.001 *
Arterial hypertension	0.028	0.751
Diabetes mellitus	0.130	0.080
Hyperlipidaemia	-0.037	0.585
Previous MI	-0.083	0.224
Smoking	-0.062	0.344
Alcohol consumption	-0.130	0.055
Loop diuretic	-0.018	0.823
Spironolactone	0.154	0.031 *
Beta-blocker	-0.035	0.650
Calcium channel blocker	0.040	0.581
ACEI	-0.027	0.697
ARB	0.139	0.052
Digoxin	0.207	0.005 *

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_3: total triiodothyronine, NYHA: New York Heart Association, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S3. Multiple regression analysis for the predicting association of TT_3 levels and other clinical factors with HF duration.

	β †	p ‡
Predictors		
Age (years)	0.201	0.008 *
BMI (kg/m^2)	0.161	0.033 *
Total T_3	-0.079	0.325
Total testosterone (nmol/L)	0.238	0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.131	0.101
Arterial hypertension	0.160	0.071
Diabetes mellitus	0.065	0.380
Hyperlipidaemia	-0.104	0.118
Previous MI	-0.048	0.479
Smoking	-0.031	0.641
Alcohol consumption	-0.290	<0.001 *
Loop diuretic	0.100	0.214
Spironolactone	0.109	0.122
Beta-blocker	-0.081	0.292
Calcium channel blocker	0.021	0.774
ACEI	0.031	0.650
ARB	0.285	<0.001 *
Digoxin	0.001	0.989

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_3: total triiodothyronine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S4. Correlation between echocardiographic parameters of cardiac function, heart failure clinical parameters, and thyroid hormones other than TT_3.

	fT_3 [pmol/L]		fT_4 [pmol/L]		TT_4 [nmol/L]		TSH [mIU/L]	
	r †	*p* ‡	*r*	*p*	*r*	*p*	*r*	*p*
Ejection fraction (%)	-0.201	0.003 *	-0.197	0.004 *	-0.105	0.126	-0.189	0.005 *
Diastolic dysfunction	0.077	0.263	0.040	0.561	-0.026	0.700	0.055	0.421
NT-proBNP [pg/mL]	0.003	0.967	0.049	0.474	0.046	0.503	0.136	0.046 *
NYHA class	-0.066	0.334	-0.045	0.515	0.086	0.208	0.184	0.007 *
HF duration (months)	-0.039	0.566	-0.211	0.002 *	-0.138	0.044 *	-0.150	0.028 *

* Statistically significant ($p<0.05$).

†, ‡ *r* and *p*-values were obtained from the independent samples *t*-test.

The normality of data distribution was tested using the Kolmogorov-Smirnov test.

NT-proBNP: N-terminal pro-type B natriuretic peptide, NYHA: New York Heart Association, HF: heart failure, fT_3: free triiodothyronine, fT_4: free thyroxine, TT_3: total triiodothyronine, TT_4: total thyroxine, TSH: thyroid stimulating hormone.

Supplementary Table S5. Multiple regression analysis for the predicting association of TSH levels and other clinical factors with HF duration.

	β †	p ‡
Predictors		
Age (years)	0.167	0.027 *
BMI (kg/m^2)	0.130	0.066
TSH	-0.179	0.010 *
Total testosterone (nmol/L)	0.224	0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.053	0.487
Arterial hypertension	0.199	0.022 *
Diabetes mellitus	0.096	0.181
Hyperlipidaemia	-0.132	0.046 *
Previous MI	-0.061	0.353
Smoking	-0.020	0.751
Alcohol consumption	-0.291	<0.001 *
Loop diuretic	0.116	0.144
Spironolactone	0.120	0.023 *
Beta-blocker	-0.141	0.049 *
Calcium channel blocker	-0.016	0.819
ACEI	-0.005	0.946
ARB	0.251	<0.001 *
Digoxin	0.012	0.864

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TSH: thyroid-stimulating hormone, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S6. Multiple regression analysis for the predicting association of TSH levels and other clinical factors with left ventricular ejection fraction.

Predictors	β †	p ‡
Age (years)	0.124	0.121
BMI (kg/m^2)	-0.006	0.940
TSH	-0.072	0.327
Total testosterone (nmol/L)	0.257	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.185	0.024 *
Arterial hypertension	0.027	0.770
Diabetes mellitus	-0.165	0.033 *
Hyperlipidaemia	0.141	0.045 *
Previous MI	0.018	0.795
Smoking	0.049	0.481
Alcohol consumption	0.004	0.953
Loop diuretic	0.149	0.079
Spironolactone	-0.135	0.066
Beta-blocker	-0.048	0.533
Calcium channel blocker	0.176	0.023 *
ACEI	0.084	0.252
ARB	0.032	0.824
Digoxin	-0.017	0.941

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TSH: thyroid-stimulating hormone, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S7. Multiple regression analysis for the predicting association of TSH levels and other clinical factors with left ventricular diastolic dysfunction.

	β †	p ‡
Predictors		
Age (years)	0.080	0.313
BMI (kg/m^2)	0.067	0.370
TSH	-0.021	0.770
Total testosterone (nmol/L)	-0.279	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.148	0.070
Arterial hypertension	0.066	0.470
Diabetes mellitus	0.164	0.032 *
Hyperlipidaemia	-0.089	0.203
Previous MI	-0.109	0.119
Smoking	0.011	0.876
Alcohol consumption	0.059	0.403
Loop diuretic	-0.219	0.009 *
Spironolactone	0.176	0.016 *
Beta-blocker	-0.128	0.091
Calcium channel blocker	-0.240	0.002 *
ACEI	0.183	0.012 *
ARB	0.106	0.160
Digoxin	0.006	0.935

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TSH: thyroid-stimulating hormone, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S8. Multiple regression analysis for the predicting association of TSH levels and other clinical factors with NT-proBNP levels.

Predictors	β †	p ‡
Age (years)	-0.124	0.039 *
BMI (kg/m^2)	-0.088	0.115
TSH	-0.077	0.162
Total testosterone (nmol/L)	-0.321	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.569	<0.001 *
Arterial hypertension	0.061	0.375
Diabetes mellitus	0.019	0.745
Hyperlipidaemia	0.018	0.733
Previous MI	-0.137	0.010 *
Smoking	-0.056	0.280
Alcohol consumption	0.072	0.175
Loop diuretic	0.062	0.324
Spironolactone	0.255	<0.001 *
Beta-blocker	-0.020	0.723
Calcium channel blocker	-0.094	0.102
ACEI	-0.065	0.238
ARB	-0.263	<0.001 *
Digoxin	-0.051	0.363

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TSH: thyroid-stimulating hormone, NT-proBNP: N-terminal pro-brain natriuretic peptide, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S9. Multiple regression analysis for the predicting association of TSH levels and other clinical factors with NYHA class.

Predictors	β †	p ‡
Age (years)	0.080	0.295
BMI (kg/m^2)	-0.017	0.816
TSH	0.090	0.198
Total testosterone (nmol/L)	-0.026	0.693
Glomerular filtration rate (ml/min/1.73m^2)	-0.302	<0.001 *
Arterial hypertension	0.020	0.817
Diabetes mellitus	0.128	0.081
Hyperlipidaemia	-0.029	0.660
Previous MI	-0.087	0.198
Smoking	-0.075	0.253
Alcohol consumption	-0.131	0.053
Loop diuretic	-0.026	0.750
Spironolactone	0.147	0.035 *
Beta-blocker	-0.034	0.642
Calcium channel blocker	0.058	0.425
ACEI	-0.017	0.804
ARB	0.152	0.035 *
Digoxin	0.190	0.008 *

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TSH: thyroid-stimulating hormone, NYHA: New York Heart Association, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S10. Multiple regression analysis for the predicting association of fT_3 levels and other clinical factors with left ventricular ejection fraction.

Predictors	β †	p ‡
Age (years)	0.147	0.059
BMI (kg/m^2)	0.011	0.885
Free T_3	-0.197	0.004 *
Total testosterone (nmol/L)	0.272	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.195	0.012 *
Arterial hypertension	0.000	0.999
Diabetes mellitus	-0.156	0.039 *
Hyperlipidaemia	0.097	0.171
Previous MI	0.050	0.473
Smoking	0.038	0.571
Alcohol consumption	0.014	0.838
Loop diuretic	0.096	0.258
Spironolactone	-0.121	0.090
Beta-blocker	-0.002	0.977
Calcium channel blocker	0.205	0.006 *
ACEI	0.115	0.109
ARB	0.066	0.368
Digoxin	-0.026	0.722

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_3: free triiodothyronine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S11. Multiple regression analysis for the predicting association of fT_4 levels and other clinical factors with left ventricular ejection fraction.

	β †	p ‡
Predictors		
Age (years)	0.145	0.061
BMI (kg/m^2)	0.025	0.731
Free T_4	-0.223	0.001 *
Total testosterone (nmol/L)	0.215	0.002 *
Glomerular filtration rate (ml/min/1.73m^2)	0.236	0.003 *
Arterial hypertension	-0.026	0.774
Diabetes mellitus	-0.175	0.019 *
Hyperlipidaemia	0.161	0.018 *
Previous MI	0.063	0.368
Smoking	0.072	0.288
Alcohol consumption	0.035	0.616
Loop diuretic	0.121	0.142
Spironolactone	-0.157	0.026 *
Beta-blocker	-0.005	0.950
Calcium channel blocker	0.224	0.003 *
ACEI	0.102	0.149
ARB	0.049	0.501
Digoxin	-0.002	0.979

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_4: free thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S12. Multiple regression analysis for the predicting association of TT_4 levels and other clinical factors with left ventricular ejection fraction.

	β †	p ‡
Predictors		
Age (years)	0.126	0.110
BMI (kg/m^2)	0.010	0.891
Total T_4	-0.140	0.041 *
Total testosterone (nmol/L)	0.243	0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.210	0.008 *
Arterial hypertension	-0.006	0.944
Diabetes mellitus	-0.195	0.011 *
Hyperlipidaemia	0.159	0.022 *
Previous MI	0.036	0.608
Smoking	0.048	0.481
Alcohol consumption	0.001	0.986
Loop diuretic	0.131	0.120
Spironolactone	-0.151	0.035 *
Beta-blocker	-0.021	0.782
Calcium channel blocker	0.212	0.005 *
ACEI	0.123	0.094
ARB	0.058	0.435
Digoxin	-0.002	0.975

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_4: total thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S13. Multiple regression analysis for the predicting association of fT_3 levels and other clinical factors with left ventricular diastolic dysfunction.

Predictors	β †	p ‡
Age (years)	0.080	0.310
BMI (kg/m^2)	0.063	0.394
Free T_3	0.065	0.339
Total testosterone (nmol/L)	-0.286	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.138	0.080
Arterial hypertension	0.068	0.454
Diabetes mellitus	0.156	0.040 *
Hyperlipidaemia	-0.069	0.335
Previous MI	-0.119	0.093
Smoking	0.010	0.886
Alcohol consumption	0.055	0.430
Loop diuretic	-0.206	0.016 *
Spironolactone	0.163	0.024 *
Beta-blocker	-0.135	0.073
Calcium channel blocker	-0.240	0.001 *
ACEI	0.180	0.013 *
ARB	0.102	0.170
Digoxin	0.065	0.339

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_3: free triiodothyronine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S14. Multiple regression analysis for the predicting association of fT_4 levels and other clinical factors with left ventricular diastolic dysfunction.

	β †	p ‡
Predictors		
Age (years)	0.081	0.300
BMI (kg/m^2)	0.061	0.413
Free T_4	0.052	0.448
Total testosterone (nmol/L)	-0.271	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.148	0.061
Arterial hypertension	0.073	0.428
Diabetes mellitus	0.162	0.032 *
Hyperlipidaemia	-0.089	0.198
Previous MI	-0.119	0.095
Smoking	0.002	0.982
Alcohol consumption	0.051	0.467
Loop diuretic	-0.216	0.010 *
Spironolactone	0.174	0.015 *
Beta-blocker	-0.131	0.080
Calcium channel blocker	-0.243	0.001 *
ACEI	0.185	0.011 *
ARB	0.108	0.144
Digoxin	-0.002	0.978

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_4: free thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S15. Multiple regression analysis for the predicting association of TT_4 levels and other clinical factors with left ventricular diastolic dysfunction.

	β †	p ‡
Predictors		
Age (years)	0.081	0.301
BMI (kg/m^2)	0.070	0.347
Total T_4	-0.028	0.678
Total testosterone (nmol/L)	-0.282	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.141	0.074
Arterial hypertension	0.059	0.524
Diabetes mellitus	0.157	0.041 *
Hyperlipidaemia	-0.084	0.225
Previous MI	-0.105	0.134
Smoking	0.010	0.884
Alcohol consumption	0.058	0.408
Loop diuretic	-0.224	0.008 *
Spironolactone	0.171	0.017 *
Beta-blocker	-0.121	0.105
Calcium channel blocker	-0.231	0.002 *
ACEI	0.192	0.009 *
ARB	0.112	0.133
Digoxin	0.008	0.913

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_4: total thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S16. Multiple regression analysis for the predicting association of fT_3 levels and other clinical factors with NT-proBNP levels.

	β †	p ‡
Predictors		
Age (years)	-0.113	0.059
BMI (kg/m^2)	-0.086	0.127
Free T_3	0.017	0.740
Total testosterone (nmol/L)	-0.324	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.545	<0.001 *
Arterial hypertension	0.051	0.462
Diabetes mellitus	0.009	0.873
Hyperlipidaemia	0.031	0.561
Previous MI	-0.139	0.010 *
Smoking	-0.063	0.222
Alcohol consumption	0.071	0.183
Loop diuretic	0.060	0.355
Spironolactone	0.240	<0.001 *
Beta-blocker	-0.009	0.872
Calcium channel blocker	-0.079	0.162
ACEI	-0.054	0.320
ARB	-0.252	<0.001 *
Digoxin	-0.061	0.280

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_3: free triiodothyronine, NT-proBNP: N-terminal pro-brain natriuretic peptide, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S17. Multiple regression analysis for the predicting association of fT_4 levels and other clinical factors with NT-proBNP levels.

	β †	p ‡
Predictors		
Age (years)	-0.116	0.050
BMI (kg/m^2)	-0.097	0.085
Free T_4	0.095	0.066
Total testosterone (nmol/L)	-0.306	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.559	<0.001 *
Arterial hypertension	0.067	0.330
Diabetes mellitus	0.012	0.835
Hyperlipidaemia	0.022	0.675
Previous MI	-0.154	0.004 *
Smoking	-0.076	0.140
Alcohol consumption	0.059	0.271
Loop diuretic	0.065	0.304
Spironolactone	0.247	<0.001 *
Beta-blocker	-0.019	0.734
Calcium channel blocker	-0.092	0.104
ACEI	-0.056	0.303
ARB	-0.252	<0.001 *
Digoxin	-0.071	0.206

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_4: free thyroxine, NT-proBNP: N-terminal pro-brain natriuretic peptide, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S18. Multiple regression analysis for the predicting association of TT_4 levels and other clinical factors with NT-proBNP levels.

	β †	p ‡
Predictors		
Age (years)	-0.108	0.070
BMI (kg/m^2)	-0.090	0.110
Total T_4	0.057	0.267
Total testosterone (nmol/L)	-0.318	<0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	-0.548	<0.001 *
Arterial hypertension	0.059	0.397
Diabetes mellitus	0.020	0.728
Hyperlipidaemia	0.023	0.662
Previous MI	-0.143	0.008 *
Smoking	-0.066	0.200
Alcohol consumption	0.073	0.170
Loop diuretic	0.061	0.339
Spironolactone	0.244	<0.001 *
Beta-blocker	-0.012	0.832
Calcium channel blocker	-0.087	0.129
ACEI	-0.064	0.248
ARB	-0.255	<0.001 *
Digoxin	-0.070	0.216

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_4: total thyroxine, NT-proBNP: N-terminal pro-brain natriuretic peptide, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S19. Multiple regression analysis for the predicting association of fT_4 levels and other clinical factors with HF duration.

	β †	p ‡
Predictors		
Age (years)	0.201	0.007 *
BMI (kg/m^2)	0.155	0.029 *
Free T_4	-0.143	0.029 *
Total testosterone (nmol/L)	0.193	0.005 *
Glomerular filtration rate (ml/min/1.73m^2)	0.125	0.097
Arterial hypertension	0.145	0.098
Diabetes mellitus	0.076	0.292
Hyperlipidaemia	-0.103	0.117
Previous MI	-0.030	0.656
Smoking	-0.019	0.776
Alcohol consumption	-0.271	<0.001 *
Loop diuretic	0.086	0.278
Spironolactone	0.120	0.078
Beta-blocker	-0.090	0.209
Calcium channel blocker	0.042	0.559
ACEI	0.028	0.685
ARB	0.284	<0.001 *
Digoxin	0.005	0.941

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_4: free thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S20. Multiple regression analysis for the predicting association of TT_4 levels and other clinical factors with NYHA class.

Predictors	β †	p ‡
Age (years)	0.075	0.318
BMI (kg/m^2)	-0.033	0.647
Total T_4	0.132	0.043 *
Total testosterone (nmol/L)	-0.013	0.848
Glomerular filtration rate (ml/min/1.73m^2)	-0.331	<0.001 *
Arterial hypertension	0.056	0.526
Diabetes mellitus	0.159	0.030 *
Hyperlipidaemia	-0.049	0.456
Previous MI	-0.104	0.123
Smoking	-0.072	0.265
Alcohol consumption	-0.128	0.057
Loop diuretic	-0.006	0.938
Spironolactone	0.166	0.015 *
Beta-blocker	-0.063	0.377
Calcium channel blocker	0.020	0.779
ACEI	-0.057	0.412
ARB	0.124	0.081
Digoxin	0.180	0.013 *

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

TT_4: total thyroxine, NYHA: New York Heart Association, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S21. Multiple regression analysis for the predicting association of fT_3 levels and other clinical factors with NYHA class.

	β †	p ‡
Predictors		
Age (years)	0.070	0.352
BMI (kg/m^2)	-0.015	0.833
Free T_3	-0.085	0.199
Total testosterone (nmol/L)	-0.016	0.811
Glomerular filtration rate (ml/min/1.73m^2)	-0.333	<0.001 *
Arterial hypertension	0.028	0.753
Diabetes mellitus	0.144	0.049
Hyperlipidaemia	-0.062	0.363
Previous MI	-0.075	0.268
Smoking	-0.068	0.300
Alcohol consumption	-0.126	0.062
Loop diuretic	-0.038	0.642
Spironolactone	0.174	0.013 *
Beta-blocker	-0.036	0.618
Calcium channel blocker	0.046	0.525
ACEI	-0.023	0.739
ARB	0.147	0.041 *
Digoxin	0.201	0.005 *

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_3: free triiodothyronine, NYHA: New York Heart Association, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S22. Multiple regression analysis for the predicting association of fT_3 levels and other clinical factors with HF duration.

	β †	p ‡
Predictors		
Age (years)	0.199	0.008 *
BMI (kg/m^2)	0.143	0.046 *
Free T_3	-0.076	0.245
Total testosterone (nmol/L)	0.225	0.001 *
Glomerular filtration rate (ml/min/1.73m^2)	0.101	0.180
Arterial hypertension	0.166	0.059
Diabetes mellitus	0.084	0.248
Hyperlipidaemia	-0.131	0.056
Previous MI	-0.046	0.495
Smoking	-0.039	0.545
Alcohol consumption	-0.287	<0.001 *
Loop diuretic	0.082	0.315
Spironolactone	0.136	0.049 *
Beta-blocker	-0.096	0.182
Calcium channel blocker	0.026	0.717
ACEI	0.031	0.656
ARB	0.289	<0.001 *
Digoxin	-0.010	0.886

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_3: free triiodothyronine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S23. Multiple regression analysis for the predicting association of fT_4 levels and other clinical factors with NYHA class.

	β †	p ‡
Predictors		
Age (years)	0.065	0.388
BMI (kg/m^2)	-0.021	0.768
Free T_4	0.004	0.947
Total testosterone (nmol/L)	-0.023	0.737
Glomerular filtration rate (ml/min/1.73m^2)	-0.328	<0.001 *
Arterial hypertension	0.035	0.692
Diabetes mellitus	0.137	0.061
Hyperlipidaemia	-0.040	0.547
Previous MI	-0.089	0.195
Smoking	-0.067	0.312
Alcohol consumption	-0.131	0.055
Loop diuretic	-0.017	0.830
Spironolactone	0.163	0.019 *
Beta-blocker	-0.050	0.485
Calcium channel blocker	0.039	0.591
ACEI	-0.032	0.648
ARB	0.137	0.056
Digoxin	0.201	0.006 *

* Statistically significant (p<0.05).

†, ‡ β and p-values were obtained from the multiple regression analysis.

fT_4: free thyroxine, NYHA: New York Heart Association, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.

Supplementary Table S24. Multiple regression analysis for the predicting association of TT_4 levels and other clinical factors with HF duration.

	ß †	*p* ‡
Predictors		
Age (years)	0.189	0.012 *
BMI (kg/m^2)	0.145	0.043 *
Total T_4	-0.085	0.190
Total testosterone (nmol/L)	0.211	0.002 *
Glomerular filtration rate (ml/min/1.73m^2)	0.107	0.153
Arterial hypertension	0.158	0.073
Diabetes mellitus	0.063	0.386
Hyperlipidaemia	-0.105	0.115
Previous MI	-0.048	0.476
Smoking	-0.034	0.600
Alcohol consumption	-0.293	<0.001 *
Loop diuretic	0.093	0.248
Spironolactone	0.124	0.070
Beta-blocker	-0.100	0.161
Calcium channel blocker	0.033	0.645
ACEI	0.040	0.567
ARB	0.289	<0.001 *
Digoxin	0.004	0.953

* Statistically significant (p<0.05).

†, ‡ *ß* and *p*-values were obtained from the multiple regression analysis.

TT_4: total thyroxine, HF: heart failure, BMI: body mass index, MI: myocardial infarction, ACEI: angiotensin-converting enzyme inhibitor, ARB: angiotensin II-receptor blocker.