

Baseline and change in serum lipid and uric acid level over time and incident of nonalcoholic fatty liver disease (NAFLD) in Chinese adults

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Table S1. Quality control data for the laboratory testing of metabolism-related indicators.

| Laboratory indicators | Bias (%) | Intra-assay CV | Inter-assay CV |
|-----------------------|---------------------|----------------|----------------|
| TC | (-3.76%) - (-1.10%) | 2.3% | 2.8% |
| TG | (-5.48%) - 2.76 | 4.4% | 3.3% |
| HDL-C | (-9.71%) - (-1.54%) | 4.1% | 3.1% |
| LDL-C | (-3.45%) - (-0.53%) | 4.2% | 2.1% |
| FBG | (-2.38%) - 1.86% | 2.8% | 3.0% |
| UA | (-5.06%) - 1.58% | 4.1% | 3.2% |
| ft3 | 1.80% - 3.81% | 3.9% | 2.0% |
| ft4 | (-0.48%) - 3.66% | 2.9% | 1.8% |
| TSH | (-2.51%) - 4.31% | 5.6% | 4.8% |
| T3 | (-3.07%) - 2.21% | 4.4% | 2.5% |
| T4 | (-1.39%) - 2.76% | 2.5% | 2.1% |

FBG: fasting blood glucose; TG: triglyceride; TC: total cholesterol; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; ft3: free triiodothyronine; ft4: free thyroxine; TSH: thyroid stimulating hormone; T3: triiodothyronine; T4: thyroxine; UA: uric acid.

Table S2. Associations between baseline metabolic markers and 1-year risk of incident NAFLD stratified by age.

| Age < 40 years old (n=2622) | | | Age ≥ 40 years old (n=803) | | |
|--|-------------------------|--------------------|--|--------------------------|--------------------|
| Characteristic | OR (95%CI) | P value | Characteristic | OR (95%CI) | P value |
| Age, per year | 1.03 (0.97-1.09) | 0.36 | Age, per year | 1.08 (1.02-1.14) | 0.009 |
| Sex, female vs male | 0.55 (0.31-0.96) | 0.04 | Sex, female vs male | 0.45 (0.27-0.73) | 0.001 |
| BMI, per SD (2.69 kg/m²) | 2.77 (2.17-3.55) | < 0.0001 | BMI, per SD (2.54 kg/m²) | 2.55 (1.90-3.41) | < 0.0001 |
| SBP, per SD (12 mmHg) | 1.13 (0.84-1.52) | 0.42 | SBP, per SD (13 mmHg) | 0.73 (0.50-1.04) | 0.08 |
| DBP, per SD (9 mmHg) | 1.36 (1.02-1.81) | 0.04 | DBP, per SD (10 mmHg) | 1.46 (1.02-2.10) | 0.04 |
| FBG, per SD (0.70 mmol/L) | 1.10 (0.96-1.26) | 0.17 | FBG, per SD (1.06 mmol/L) | 1.18 (1.004-1.38) | 0.04 |
| TG, per SD (0.81 mmol/L) | 1.20 (1.03-1.40) | 0.02 | TG, per SD (1.09 mmol/L) | 1.21 (1.01-1.45) | 0.04 |
| TC, per SD (0.85 mmol/L) | 0.90 (0.72-1.13) | 0.36 | TC, per SD (0.78 mmol/L) | 0.86 (0.67-1.11) | 0.24 |
| HDL-C, per SD (0.33 mmol/L) | 0.58 (0.46-0.73) | < 0.0001 | HDL-C, per SD (0.33 mmol/L) | 0.71 (0.55-0.91) | 0.006 |
| LDL-C, per SD (0.66 mmol/L) | 1.27 (1.07-1.50) | 0.007 | LDL-C, per SD (0.64 mmol/L) | 1.12 (0.91-1.37) | 0.31 |
| UA, per SD (95.25 umol/L) | 1.60 (1.24-2.08) | 0.0004 | UA, per SD (95.25 umol/L) | 1.54 (1.26-1.88) | < 0.0001 |
| ft3, per SD (0.81 pmol/L) | 1.81 (1.36-2.40) | < 0.0001 | ft3, per SD (1.01 pmol/L) | 0.96 (0.71-1.31) | 0.81 |
| ft4, per SD (2.17 pmol/L) | 0.57 (0.42-0.77) | 0.0003 | ft4, per SD (2.14 pmol/L) | 0.98 (0.72-1.33) | 0.88 |
| ALT, per SD (11 U/L) | 1.99 (1.42-2.80) | < 0.0001 | ALT, per SD (20 U/L) | 0.94 (0.59-1.49) | 0.78 |
| AST, per SD (5 U/L) | 0.83 (0.64-1.07) | 0.13 | AST, per SD (8 U/L) | 1.26 (0.81-1.96) | 0.32 |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; FBG: fasting blood glucose; TG: triglyceride; TC: total cholesterol; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; ft3: free triiodothyronine; ft4: free thyroxine; TSH: thyroid stimulating hormone; UA: uric acid. SD: standard deviation.

Data was adjusted for age, sex, smoking and alcohol habits, status of diabetes and hypertension, BMI, SBP, DBP, FBG, TG, TC, HDL-C, LDL-C, UA, ft3, ft4, ALT and AST.

Table S3. Associations between baseline metabolic markers and 1-year risk of incident NAFLD stratified by sex.

| Male (n=1146) | | | Female (n=2279) | | |
|--|-------------------------|--------------------|--|-------------------------|--------------------|
| Characteristic | OR (95%CI) | <i>P</i> value | Characteristic | OR (95%CI) | <i>P</i> value |
| Age, per year | 1.02 (0.98-1.05) | 0.33 | Age, per year | 1.08 (1.04-1.13) | 0.0002 |
| BMI, per SD (2.34 kg/m²) | 1.19 (1.77-2.71) | < 0.0001 | BMI, per SD (2.47 kg/m²) | 2.79 (2.06-3.79) | < 0.0001 |
| SBP, per SD (12 mmHg) | 0.79 (0.61-1.04) | 0.09 | SBP, per SD (12 mmHg) | 1.16 (0.77-1.74) | 0.49 |
| DBP, per SD (9 mmHg) | 1.56 (1.18-2.07) | 0.002 | DBP, per SD (9 mmHg) | 1.25 (0.85-1.84) | 0.25 |
| FBG, per SD (0.68 mmol/L) | 0.81 (0.63-1.05) | 0.12 | FBG, per SD (0.95 mmol/L) | 1.21 (1.06-1.38) | 0.004 |
| TG, per SD (0.71 mmol/L) | 1.32 (1.12-1.55) | 0.0007 | TG, per SD (0.71 mmol/L) | 1.38 (1.21-1.58) | < 0.0001 |
| TC, per SD (0.81 mmol/L) | 0.82 (0.67-1.00) | 0.05 | TC, per SD (0.84 mmol/L) | 0.98 (0.73-1.33) | 0.93 |
| HDL-C, per SD (0.27 mmol/L) | 0.75 (0.62-0.91) | 0.003 | HDL-C, per SD (0.34 mmol/L) | 0.68 (0.51-0.89) | 0.006 |
| LDL-C, per SD (0.67 mmol/L) | 1.13 (0.95-1.33) | 0.17 | LDL-C, per SD (0.63 mmol/L) | 1.37 (1.09-1.71) | 0.006 |
| UA, per SD (82.5 umol/L) | 1.39 (1.18-1.63) | < 0.0001 | UA, per SD (55.11 umol/L) | 1.60 (1.31-1.94) | < 0.0001 |
| ft3, per SD (0.88 pmol/L) | 1.01 (0.81-1.27) | 0.91 | ft3, per SD (0.82 pmol/L) | 1.40 (1.00-1.98) | 0.04 |
| ft4, per SD (1.67 pmol/L) | 0.75 (0.61-0.94) | 0.01 | ft4, per SD (2.43 pmol/L) | 0.77 (0.53-1.14) | 0.20 |
| ALT, per SD (19 U/L) | 1.45 (0.95-2.22) | 0.08 | ALT, per SD (8 U/L) | 1.40 (0.89-2.18) | 0.15 |
| AST, per SD (7 U/L) | 0.87 (0.59-1.29) | 0.49 | AST, per SD (5 U/L) | 0.84 (0.52-1.36) | 0.48 |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; FBG: fasting blood glucose; TG: triglyceride; TC: total cholesterol; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; ft3: free triiodothyronine; ft4: free thyroxine; TSH: thyroid stimulating hormone; UA: uric acid. SD: standard deviation.

Data was adjusted for age, smoking and alcohol habits, status of diabetes and hypertension, BMI, SBP, DBP, FBG, TG, TC, HDL-C, LDL-C, UA, ft3, ft4, ALT and AST.

Table S4. Associations between one-year changes of metabolism-related indicators and risk of incident NAFLD stratified by age.

| Age < 40 years old (n=2622) | | | Age ≥ 40 years old (n=803) | | |
|---|-------------------------|--------------------|--|-------------------------|--------------------|
| Metabolism-related indicators | OR (95%CI) | P value | Metabolism-related indicators | OR (95%CI) | P value |
| ΔBMI, per SD (0.94 kg/m²) | 2.78 (1.79-4.31) | < 0.0001 | ΔBMI, per SD (1.83 kg/m ²) | 1.16 (0.91-1.48) | 0.23 |
| ΔSBP, per SD (11 mmHg) | 1.03 (0.77-1.37) | 0.86 | ΔSBP, per SD (11 mmHg) | 1.08 (0.80-1.45) | 0.63 |
| ΔDBP, per SD (9 mmHg) | 0.87 (0.66-1.15) | 0.33 | ΔDBP, per SD (9 mmHg) | 1.03 (0.79-1.35) | 0.81 |
| ΔFBG, per SD (1.78 mmol/L) | 1.06 (0.84-1.33) | 0.61 | ΔFBG, per SD (1.30 mmol/L) | 1.40 (1.08-1.82) | 0.01 |
| ΔTG, per SD (0.91 mmol/L) | 1.33 (1.10-1.60) | 0.003 | ΔTG, per SD (1.45 mmol/L) | 2.23 (1.51-3.29) | < 0.0001 |
| ΔTC, per SD (0.72 mmol/L) | 0.85 (0.67-1.10) | 0.22 | ΔTC, per SD (0.81 mmol/L) | 1.24 (0.96-1.60) | 0.10 |
| ΔHDL-C, per SD (0.26 mmol/L) | 0.49 (0.35-0.67) | < 0.0001 | ΔHDL-C, per SD (0.30 mmol/L) | 0.49 (0.36-0.68) | < 0.0001 |
| ΔLDL-C, per SD (0.52 mmol/L) | 0.90 (0.70-1.15) | 0.39 | ΔLDL-C, per SD (0.66 mmol/L) | 1.09 (0.83-1.42) | 0.53 |
| ΔUA, per SD (53.50 μmol/L) | 1.24 (1.00-1.54) | 0.04 | ΔUA, per SD (55.33 μmol/L) | 1.54 (1.18-2.01) | 0.002 |
| ΔfT3, per SD (0.74 pmol/L) | 1.71 (1.12-2.61) | 0.01 | ΔfT3, per SD (1.19 pmol/L) | 0.84 (0.53-1.33) | 0.46 |
| ΔfT4, per SD (1.89 pmol/L) | 1.24 (0.89-1.73) | 0.21 | ΔfT4, per SD (2.40 pmol/L) | 1.29 (0.89-1.88) | 0.88 |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; FBG: fasting blood glucose; TG: triglyceride; TC: total cholesterol; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; fT3: free triiodothyronine; fT4: free thyroxine; TSH: thyroid stimulating hormone; UA: uric acid. SD: standard deviation.

Data was adjusted for age, sex, smoking and alcohol habits, status of diabetes and hypertension, BMI, SBP, DBP, FBG, TG, TC, HDL-C, LDL-C, UA, fT3, fT4, ALT and AST.

Table S5. Associations between one-year changes of metabolism-related indicators and risk of incident NAFLD stratified by sex.

| Male (n=1146) | | | Female (n=2279) | | |
|--|-------------------------|--------------------|--|-------------------------|----------------|
| Metabolism-related indicators | OR (95%CI) | <i>P</i> value | Metabolism-related indicators | OR (95%CI) | <i>P</i> value |
| ΔBMI, per SD (1.51 kg/m ²) | 1.32 (0.95-1.85) | 0.10 | ΔBMI, per SD (0.95 kg/m ²) | 1.36 (0.49-3.80) | 0.55 |
| ΔSBP, per SD (11 mmHg) | 0.98 (0.78-1.24) | 0.88 | ΔSBP, per SD (11 mmHg) | 1.33 (0.88-2.02) | 0.18 |
| ΔDBP, per SD (9 mmHg) | 0.93 (0.74-1.15) | 0.48 | ΔDBP, per SD (9 mmHg) | 1.07 (0.72-1.58) | 0.75 |
| ΔFBG, per SD (0.78 mmol/L) | 1.36 (1.12-1.64) | 0.002 | ΔFBG, per SD (2.05 mmol/L) | 1.05 (0.81-1.37) | 0.70 |
| ΔTG, per SD (1.30 mmol/L) | 2.13 (1.63-2.77) | < 0.0001 | ΔTG, per SD (0.92 mmol/L) | 1.19 (0.94-1.50) | 0.16 |
| ΔTC, per SD (0.69 mmol/L) | 1.15 (0.95-1.40) | 0.16 | ΔTC, per SD (0.79 mmol/L) | 0.87 (0.61-1.23) | 0.41 |
| ΔHDL-C, per SD (0.25 mmol/L) | 0.55 (0.44-0.70) | < 0.0001 | ΔHDL-C, per SD (0.28 mmol/L) | 0.45 (0.30-0.68) | 0.0002 |
| ΔLDL-C, per SD (0.56 mmol/L) | 1.01 (0.83-1.24) | 0.89 | ΔLDL-C, per SD (0.57 mmol/L) | 0.98 (0.69-1.40) | 0.89 |
| ΔUA, per SD (58.77 umol/L) | 1.35 (1.10-1.65) | 0.005 | ΔUA, per SD (50.32 umol/L) | 1.54 (1.13-2.06) | 0.007 |
| ΔfT3, per SD (1.03 pmol/L) | 1.10 (0.76-1.60) | 0.31 | ΔfT3, per SD (0.87 pmol/L) | 1.18 (0.65-2.15) | 0.59 |
| ΔfT4, per SD (1.96 pmol/L) | 1.23 (0.96-1.58) | 0.10 | ΔfT4, per SD (2.45 pmol/L) | 1.62 (0.80-3.27) | 0.18 |

BMI: body mass index; SBP: systolic blood pressure; DBP: diastolic blood pressure; FBG: fasting blood glucose; TG: triglyceride; TC: total cholesterol; HDL-C: high density lipoprotein cholesterol; LDL-C: low density lipoprotein cholesterol; fT3: free triiodothyronine; fT4: free thyroxine; TSH: thyroid stimulating hormone; UA: uric acid. SD: standard deviation.

Data was adjusted for age, smoking and alcohol habits, status of diabetes and hypertension, BMI, SBP, DBP, FBG, TG, TC, HDL-C, LDL-C, UA, fT3, fT4, ALT and AST.