**Twin Research and Human Genetics**

**Supplementary material**

**Associations Between Obesity Indicators and Blood Pressure in Chinese Adult Twins**

Chunxiao Liao, Wenjing Gao, Weihua Cao, Jun Lv, Canqing Yu, Shengfeng Wang, Qian Zhao, Zengchang Pang, Liming Cong, Hua Wang, Xianping Wu, and Liming Li

\

**Supplementary Table 1**

**Fixed-Effect Regression Analyses of Obesity-Related Measures and Blood Pressure Within 248 MZ Twin Pairs Stratified By Gender (MZ Male Twins: 164 pairs; MZ Female Twins: 84 pairs)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | MZ male twin pairs |  | MZ female twin pairs | *p* value  for interactiona |
|  | β [95% CI] |  | β [95% CI] |
| SBP |  |  |  |  |
| BMI (kg/m2) | 0.012 [0.005, 0.020] \*\* |  | 0.006 [-0.001, 0.014] | .398 |
| WC (cm) | 0.004 [0.001, 0.006] \*\* |  | 0.002 [-.0006, 0.005] | .577 |
| WHtR | 0.588 [0.243, 0.932] \*\* |  | 0.321 [-0.068, 0.709] | .518 |
| WHR | 0.257 [-0.006, 0.520] |  | 0.131 [-0.280, 0.541] | .754 |
| ZBMI | 0.040 [0.016, 0.064] \*\* |  | 0.025 [-.0005, 0.051] | — |
| ZWC | 0.033 [0.012, 0.055] \*\* |  | 0.016 [-0.004, 0.036] | — |
| ZWHtR | 0.033 [0.011, 0.055] \*\* |  | 0.015 [-0.005, 0.035] | — |
| ZWHR | 0.017 [0.001, 0.034] \* |  | 0.007 [-0.017, 0.030] | — |
| DBP |  |  |  |  |
| BMI (kg/m2) | 0.015 [0.008, 0.022] \*\*\* |  | 0.004 [-0.004, 0.012] | .037 |
| WC (cm) | 0.003 [0.001, 0.006] \*\* |  | 0.001 [-0.018, 0.004] | .320 |
| WHtR | 0.561 [0.205, 0.916] \*\* |  | 0.217 [-0.227, 0.661] | .319 |
| WHR | 0.320 [0.039, 0.601]\* |  | 0.148 [-0.264, 0.561] | .606 |
| ZBMI | 0.052 [0.029, 0.075] \*\*\* |  | 0.021 [-0.005, 0.047] | — |
| ZWC | 0.038 [0.017, 0.059] \*\* |  | 0.015 [-0.013, 0.043] | — |
| ZWHtR | 0.038 [0.016, 0.060] \*\* |  | 0.016 [-0.014, 0.046] | — |
| ZWHR | 0.022 [0.004, 0.039]\* |  | 0.008 [-0.017, 0.0323] | — |

Note: MZ = monozygotic; SBP = systolic blood pressure; DBP = diastolic blood pressure; BMI = body mass index; WC = waist circumference; WHtR = waist–height ratio; WHR = waist–hip ratio.

All regression models were adjusted for age, region, social economic status, smoking status, drinking status, salt eating habit and MET value.

a *p* values for interaction between sex and each of the obesity-related measures on the blood pressure levels.

\**p* < .05, \*\**p* < .01, \*\*\**p* < .001

Supplementary Table 2

Within-Pair Intra-Class Correlations of Obesity-Related Measures and Blood Pressure By Zygosity

|  |  |  |
| --- | --- | --- |
|  | MZ | DZ |
| Number of pairs | 242 | 105 |
| SBP | 0.709 | 0.403 |
| DBP | 0.680 | 0.359 |
| BMI | 0.696 | 0.081 |
| WC | 0.647 | 0.256 |
| WHtR | 0.615 | 0.320 |
| WHR | 0.528 | 0.401 |

Note: MZ = monozygotic; DZ = dizygotic; SBP = systolic blood pressure; DBP = diastolic blood pressure; BMI = body mass index; WC = waist circumference; WHtR = waist–height ratio; WHR = waist–hip ratio.

Supplementary Table 3

Best-Fitting Models for All Phenotypes in Univariate Genetic Models\*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Phenotype | Model | Variance components | | -2LL | *df* | AIC | Compared with saturated model | | |
| A [95% CI] | E [95% CI] | ΔAIC | Δ*df* | *p* |
| SBP | AE | 0.609 [0.525, 0.679] | 0.391 [0.321, 0.475] | -961.198 | 681 | -2323.198 | -2 | 1 | 1.000 |
| DBP | AE | 0.635 [0.554, 0.702] | 0.365 [0.298, 0.445] | -914.505 | 681 | -2276.505 | -2 | 1 | 1.000 |
| BMI | AE | 0.630 [0.547, 0.699] | 0.370 [0.301, 0.453] | 1758.109 | 672 | 414.109 | -2 | 1 | 1.000 |
| WC | AE | 0.585 [0.498, 0.659] | 0.415 [0.341, 0.502] | 1826.069 | 680 | 466.069 | -2 | 1 | 1.000 |
| WHtR | AE | 0.571 [0.484, 0.646] | 0.429 [0.354, 0.516] | 1739.583 | 680 | 379.583 | -2 | 1 | 1.000 |
| WHR | AE | 0.445 [0.343, 0.536] | 0.555 [0.464, 0.657] | 1882.476 | 680 | 522.476 | -2 | 1 | 1.000 |

Note: *n* = 242 monozygotic and 105 dizygotic twin pairs.

A = additive genetic; E = unique environment; -2LL =twice the negative log-likelihood; *df* = degree of freedom; *p* = χ2 test in model fitting; AIC = Akaike information criterion; SBP, systolic blood pressure; DBP = diastolic blood pressure; BMI= body mass index; WC = waist circumference; WHtR, waist–height ratio; WHR, waist–hip ratio.

\*Models were adjusted for age, sex, region, social economic status, smoking status and drinking status for variance component of obesity-related measures while additionally adjusted for salt intake for variance component of SBP and DBP.