|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S1. Correlations among study measures | | | | | |  |  |  |  |  |  |
| BHS | GGT |  | ALT |  | AST |  | FLI |  | TG |  | BMI |
| GGT |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ALT | 0.505 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| AST | 0.518 |  | 0.736 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| FLI | 0.316 |  | 0.370 |  | 0.161 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| TG | 0.148 |  | 0.236 |  | 0.072 |  | 0.479 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | 0.090 |  | 0.156 |  | 0.026\* |  | 0.838 |  | 0.205 |  |  |
| all p<0.01 except \*p=0.27 | | | | | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| YF |  |  |  |  |  |  |  |  |  |  |  |
| GGT |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| ALT | 0.536 |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| AST | 0.457 |  | 0.751 |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| FLI | 0.479 |  | 0.456 |  | 0.292 |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| TG | 0.238 |  | 0.255 |  | 0.129 |  | 0.485 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| BMI | 0.242 |  | 0.268 |  | 0.180 |  | 0.848 |  | 0.274 |  |  |
| all p<0.01 | | | |  |  |  |  |  |  |  |  |
| BHS, Bogalusa Heart Study; GGT, gamma-glutamase transferase; ALT, alanine aminotransferase; AST, aspartate aminotransferase; FLI, fatty liver index; TG, triglycerides; BMI, body mass index; LDL, low-density lipoprotein; YF, Cardiovascular Risk in Young Finns Study | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S2. Birth outcomes as predictors of clinically high levels of liver enzymes, The Bogalusa Heart Study | | | | | | | | | |
|  |  | unadjusted | |  | adjusted for age, sex, race, smoking, alcohol use, education, income, physical activity | |  | adjusted for previous + BMI | |
|  |  | OR | 95% CI |  | OR | 95% CI |  | OR | 95% CI |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 1.46 | (0.87, 2.45) |  | 1.21 | (0.70, 2.10) |  | 1.26 | (0.73, 2.19) |
| macrosomia |  | 1.07 | (0.66, 1.73) |  | 1.20 | (0.72, 1.99) |  | 1.11 | (0.66, 1.85) |
|  |  |  |  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.61 | (0.24,1.51) |  | 0.70 | (0.27, 1.79) |  | 0.68 | (0.26, 1.76) |
| macrosomia |  | 0.79 | (0.39, 1.59) |  | 0.66 | (0.32, 1.35) |  | 0.59 | (0.28, 1.21) |
|  |  |  |  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.70 | (0.35, 1.41) |  | 0.64 | (0.31, 1.35) |  | 0.65 | (0.31, 1.37) |
| macrosomia |  | 0.91 | (0.53, 1.57) |  | 0.83 | (0.47, 1.47) |  | 0.80 | (0.45, 1.41) |
|  |  |  |  |  |  |  |  |  |  |
| fatty liver index (FLI) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.54 | (0.35, 0.85) |  | 0.53 | (0.33, 0.85) |  |  |  |
| macrosomia |  | 1.27 | (0.91, 1.76) |  | 1.26 | (0.89, 1.80) |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S3. Birth outcomes as predictors of continuous liver enzymes (log-transformed, within the normal range), with adjustment for confounders, the Bogalusa Heart Study | | | | | | | | | | | | |
|  |  | model 1 | | |  |  |  | model 2 | | |  |  |
|  |  | unadjusted | | |  |  |  | adjusted for age, sex, race, smoking, alcohol use, education, income, physical activity | | |  |  |
|  |  | beta | SE | p |  | p for interaction |  | beta | SE | p |  | p for interaction |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | -0.05 | 0.09 | 0.59 |  | 0.14 |  | -0.09 | 0.08 | 0.28 |  | 0.07 |
| macrosomia |  | -0.04 | 0.05 | 0.46 |  | 0.24 |  | 0.00 | 0.05 | 1.00 |  | 0.27 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.09 | 0.05 | 0.06 |  |  |  | 0.07 | 0.05 | 0.18 |  |  |
| macrosomia |  | -0.13 | 0.06 | 0.02 |  |  |  | -0.08 | 0.05 | 0.13 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | -0.02 | 0.08 | 0.79 |  | 0.77 |  | 0.01 | 0.08 | 0.89 |  | 0.93 |
| macrosomia |  | 0.01 | 0.05 | 0.78 |  | 0.60 |  | 0.01 | 0.05 | 0.77 |  | 0.64 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.00 | 0.05 | 0.93 |  |  |  | 0.03 | 0.05 | 0.58 |  |  |
| macrosomia |  | 0.05 | 0.05 | 0.32 |  |  |  | 0.04 | 0.05 | 0.50 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.04 | 0.05 | 0.36 |  | 0.46 |  | 0.03 | 0.05 | 0.50 |  | 0.44 |
| macrosomia |  | -0.03 | 0.03 | 0.25 |  | 0.37 |  | -0.03 | 0.03 | 0.35 |  | 0.34 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.08 | 0.03 | <0.01 |  |  |  | 0.09 | 0.03 | <0.01 |  |  |
| macrosomia |  | 0.01 | 0.03 | 0.85 |  |  |  | 0.00 | 0.03 | 1.00 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| fatty liver index (FLI) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | -17.01 | 5.87 | <0.01 |  | 0.02 |  | -12.58 | 5.61 | 0.02 |  | 0.07 |
| macrosomia |  | 1.16 | 3.61 | 0.75 |  | 0.85 |  | 0.64 | 3.44 | 0.85 |  | 0.79 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | -0.93 | 3.92 | 0.81 |  |  |  | -6.17 | 3.80 | 0.10 |  |  |
| macrosomia |  | 2.26 | 4.38 | 0.61 |  |  |  | 6.15 | 4.25 | 0.15 |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | model 3 | | |  |  |
|  |  | previous + BMI | | |  |  |
|  |  | beta | SE | p |  | p for interaction |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | -0.09 | 0.08 | 0.28 |  | 0.10 |
| macrosomia |  | -0.01 | 0.05 | 0.84 |  | 0.25 |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.07 | 0.05 | 0.13 |  |  |
| macrosomia |  | -0.11 | 0.05 | 0.04 |  |  |
|  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | 0.02 | 0.08 | 0.77 |  | 0.95 |
| macrosomia |  | 0.01 | 0.05 | 0.89 |  | 0.82 |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.04 | 0.05 | 0.39 |  |  |
| macrosomia |  | 0.00 | 0.05 | 0.93 |  |  |
|  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | 0.03 | 0.05 | 0.48 |  | 0.44 |
| macrosomia |  | -0.03 | 0.27 | 0.34 |  | 0.35 |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.09 | 0.03 | <0.01 |  |  |
| macrosomia |  | 0.00 | 0.03 | 0.94 |  |  |
|  |  |  |  |  |  |  |
| fatty liver index (FLI) |  |  |  |  |  |  |
|  |  | BMI included in measure | | |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S4. Birth outcomes as predictors of clinically high levels of liver enzymes, Cardiovascular Risk in Young Finns | | | | | | | | | |
|  |  | unadjusted | |  | adjusted for age, sex, smoking, alcohol use, social class, physical activity | |  | adjusted for previous + BMI | |
|  |  | OR | 95% CI |  | OR | 95% CI |  | OR | 95% CI |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 1.88 | (1.16, 3.06) |  | 1.68 | (1.02, 2.76) |  | 1.65 | (0.98, 2.77) |
| macrosomia |  | 1.15 | (0.85, 1.55) |  | 1.11 | (0.81, 1.51) |  | 0.99 | (0.71, 1.37) |
|  |  |  |  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 1.54 | (0.47, 4.98) |  | 1.19 | (0.36, 3.93) |  | 1.02 | (0.29, 3.59) |
| macrosomia |  | 0.84 | (0.38, 1.87) |  | 0.75 | (0.33, 1.68) |  | 0.65 | (0.28, 1.48) |
|  |  |  |  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 1.54 | (0.47, 4.98) |  | 1.19 | (0.36, 3.93) |  | 1.02 | (0.29, 3.59) |
| macrosomia |  | 0.84 | (0.38, 1.87) |  | 0.75 | (0.33, 1.68) |  | 0.65 | (0.28, 1.48) |
|  |  |  |  |  |  |  |  |  |  |
| fatty liver index (FLI) |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 1.76 | (1.17, 2.65) |  | 1.98 | (1.33, 2.95) |  | Measurement includes BMI | |
| macrosomia |  | 1.25 | (0.98, 1.58) |  | 0.93 | (0.74, 1.18) |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table S5, Birth outcomes as predictors of continuous liver enzymes (log-transformed, within the normal range), with adjustment for confounders, Cardiovascular Risk in Young Finns Study | | | | | | | | | | | | |
|  |  | model 1 | | |  |  |  | model 2 | | |  |  |
|  |  | unadjusted | | |  |  |  | adjusted for age, sex, race, smoking, alcohol use, education, income, physical activity | | |  |  |
|  |  | beta | SE | p |  | p for interaction |  | beta | SE | p |  | p for interaction |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.19 | 0.09 | 0.03 |  | 0.12 |  | 0.16 | 0.08 | 0.06 |  | 0.12 |
| macrosomia |  | -0.04 | 0.04 | 0.27 |  | 0.79 |  | -0.03 | 0.04 | 0.36 |  | 0.79 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.05 | 0.05 | 0.30 |  |  |  | 0.03 | 0.05 | 0.51 |  |  |
| macrosomia |  | -0.03 | 0.03 | 0.23 |  |  |  | -0.04 | 0.03 | 0.08 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.18 | 0.08 | 0.03 |  | 0.44 |  | 0.16 | 0.08 | 0.04 |  | 0.43 |
| macrosomia |  | -0.04 | 0.04 | 0.30 |  | 0.77 |  | -0.03 | 0.04 | 0.33 |  | 0.86 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.11 | 0.05 | 0.02 |  |  |  | 0.10 | 0.05 | 0.03 |  |  |
| macrosomia |  | -0.02 | 0.03 | 0.39 |  |  |  | -0.02 | 0.03 | 0.50 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.04 | 0.04 | 0.35 |  | 0.70 |  | 0.04 | 0.04 | 0.40 |  | 0.65 |
| macrosomia |  | 0.00 | 0.02 | 0.90 |  | 0.28 |  | 0.00 | 0.02 | 0.94 |  | 0.31 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 0.02 | 0.03 | 0.52 |  |  |  | 0.02 | 0.03 | 0.60 |  |  |
| macrosomia |  | 0.03 | 0.02 | 0.12 |  |  |  | 0.03 | 0.02 | 0.13 |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| fatty liver index (FLI) |  |  |  |  |  |  |  |  |  |  |  |  |
| men |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 2.87 | 5.06 | 0.57 |  | 0.17 |  | 3.93 | 4.70 | 0.40 |  | 0.31 |
| macrosomia |  | 3.85 | 2.42 | 0.11 |  | 0.05 |  | 3.16 | 2.21 | 0.15 |  | 0.02 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |  |  |  |  |  |  |
| low birthweight |  | 10.86 | 3.22 | <0.01 |  |  |  | 10.42 | 3.24 | <0.01 |  |  |
| macrosomia |  | -2.11 | 1.88 | 0.26 |  |  |  | -2.83 | 1.87 | 0.13 |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | model 3 | | |  |  |
|  |  | previous + BMI | | |  |  |
|  |  | beta | SE | p |  | p for interaction |
| gamma-glutamate transferase (GGT) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | 0.17 | 0.08 | 0.03 |  | 0.05 |
| macrosomia |  | -0.05 | 0.04 | 0.12 |  | 0.81 |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.02 | 0.04 | 0.70 |  |  |
| macrosomia |  | -0.04 | 0.02 | 0.09 |  |  |
|  |  |  |  |  |  |  |
| alanine transaminase (ALT) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | 0.14 | 0.07 | 0.06 |  | 0.42 |
| macrosomia |  | -0.06 | 0.03 | 0.05 |  | 0.63 |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.10 | 0.05 | 0.03 |  |  |
| macrosomia |  | -0.02 | 0.03 | 0.36 |  |  |
|  |  |  |  |  |  |  |
| aspartate transaminase (AST) |  |  |  |  |  |  |
| men |  |  |  |  |  |  |
| low birthweight |  | 0.03 | 0.04 | 0.41 |  | † |
| macrosomia |  | -0.01 | 0.02 | 0.53 |  | † |
|  |  |  |  |  |  |  |
| women |  |  |  |  |  |  |
| low birthweight |  | 0.01 | 0.03 | 0.71 |  |  |
| macrosomia |  | 0.02 | 0.02 | 0.13 |  |  |
|  |  |  |  |  |  |  |
| fatty liver index (FLI) |  | BMI included in measurement | | | | |