**Table S1: Single nucleotide polymorphism and test of Hardy–Weinberg equilibrium**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Gene | rs number | location | allele | ABI Assay-on-demand-number ID | Homozygote (minor  allele) | Heterozygote | Homozygote (alternative allele) | χ2 | p value |
| *CYP24A1* | rs2248359 | 20q13.2c | C/T | C\_\_16261116\_10 | 537(35.9） | 710(47.5） | 230(15.4) | 0.034 | 0.853 |
| rs6013897 | 20q13.2c | A/T | C\_\_29958084\_10 | 36(2.4） | 369(24.7） | 1062(71.1） | 0.341 | 0.559 |
| *GC* | rs3733359 | 4q13.3b | A/G | C\_\_25652813\_30 | 165(11.0） | 659(44.1） | 625(41.8） | 0.193 | 0.661 |
| rs2282679 | 4q13.3b | G/T | C\_\_26407519\_10 | 136(9.1） | 617(41.3） | 712(47.7） | 0.020 | 0.889 |
| rs16847024 | 4q13.3b | C/T | C\_\_33133975\_10 | 30(2.0) | 298(19.9） | 1016(68.0） | 2.118 | 0.146 |
| *CYP2R1* | rs2060793 | 11p15.2b | A/G | C\_\_\_2958431\_10 | 203(13.6) | 677(45.3) | 564(37.8) | 0.000 | 0.994 |
| rs10741657 | 11p15.2b | A/G | C\_\_\_2958430\_10 | 195(13.1) | 679(45.4) | 564(37.8) | 0.172 | 0.678 |
| *VDR* | rs11574143 | 12q13.11c | C/T | C\_\_30742412\_10 | 77(5.2) | 495(33.1) | 894(59.8) | 0.614 | 0.433 |
| rs739837 | 12q13.11c | G/T | C\_\_\_2404007\_10 | 116(7.8)735 | 578(38.7) | (49.2) | 0.025 | 0.874 |

**Table S2: Clinical characteristics of the study participants**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Controls(n=802) | GDM（n=692） | P value |
| Age(years) | 31.00 [28.00, 34.00] | 32.00[30.00, 35.00] | <0.001 |
| Body mass index before gestation (kg/m2) | 20.70 [19.15, 22.49] | 21.71 [19.95, 24.06] | <0.001 |
| Systolic blood pressure (mmHg) | 110.00 [102.00, 120.00] | 114.00[106.25,123.00] | <0.001 |
| Diastolic blood pressure (mmHg) | 68.00 [61.00, 73.00] | 70.00 [63.50, 75.00] | <0.001 |
| Fasting plasma glucose(mmol/l) | 4.50 [4.30, 4.70] | 4.80 [4.50, 5.20] | <0.001 |
| Fasting plasma insulin (pmol/l) | 6.20 [4.40, 9.23] | 7.50 [5.20, 11.10] | <0.001 |
| Glycated hemoglobin protein (%) | 5.20 [5.00, 5.40] | 5.40 [5.20, 5.70] | <0.001 |
| HOMA-B | 134.00 [92.73, 195.56] | 115.38 [80.00, 175.71] | <0.001 |
| HOMA-IR | 1.25 [0.84, 1.87] | 1.62 [1.08, 2.51] | <0.001 |
| AUC of insulin during 100 g OGTT at the time of GDM diagnosis (mU l-1 ×h) | 158.05[110.63, 227.20] | 200.45[144.84,288.05] | <0.001 |
| White blood count (\*1012/l) | 8.98 [7.65, 10.20] | 9.40 [8.14, 10.82] | <0.001 |
| Platelet count (\*109/l) | 221.02 ± 48.98 | 241.85 ± 53.75 | <0.001 |
| High sensitivity C-reactive protein (mg/l) | 2.19 [1.33, 4.36] | 3.26 [1.75, 5.78] | <0.001 |

GDM: gestational diabetes mellitus; HOMA-B: Homeostasis model assessment of beta-cell function; HOMA-IR: Homeostasis model assessment of insulin resistance; AUC: area under curve; OGTT: oral glucose tolerance test

Platelet count was the quantitative variable with normal distribution, data are shown as means ± standard deviation.

Data is shown as medians (interquartile range) for the quantitative variables with non-normal distribution.

Three variables (HOMA-B,HOMA-IR,AUC of insulin) were log-transformed to approximate normal distributions and were analyzed by t test.

Other variables shown in Table S2 were analyzed using nonparametric tests.

**Table S3: Genotype and allele distributions and corresponding odds ratios for gestational diabetes mellitus**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Rs number | Genotype  or risk  allele | GDM  Number (%) | Controls  Number (%) | P Value of genotype or allele frequency | P value for homozygote or heterzygote of risk allele/ protective allele OR (95% CI) | dominant model  P value and  OR (95% CI) | recessive model  P value and  OR (95% CI) |
| rs2248359 | CC | 237(34.8) | 300(37.7) | 0.484 | 1 | 0.25  1.133(0.916-1.402) | 0.476  1.108(0.836-1.468) |
| CT | 333(48.1) | 377(47.4) |  | 0.331  1.118(0.893-1.401) |  |  |
| TT | 111(16.3) | 119(14.9) |  | 1.181(0.866-1.609)  0.293 |  |  |
| T |  |  | 0.240 | 1.093(0.942-1.268) |  |  |
| rs11574143 | CC | 407(60.2) | 487(61.6) | 0.31 | 1 | 0.574  1.062(0.861-1.311) | 0.129  1.429(0.901-2.266) |
| CT | 227(33.6) | 268(33.9) |  | 0.905  1.014(0.813-1.263) |  |  |
| TT | 42(6.2) | 35(4.4) |  | 0.129  1.436(0.900-2.292) |  |  |
| T |  |  | 0.300 | 1.096(0.922-1.33) |  |  |
| rs739837 | GG | 334(50.8) | 401(51.9) | 0.843 | 1 | 0.677  1.045(0.849-1.287) | 0.590  1.114(0.753-1.648) |
| GT | 267(40.6) | 311(40.3) |  | 0.786  1.031(0.828-1.283) |  |  |
| TT | 56(8.5) | 60(7.8) |  | 0.569  1.121(0.757-1.658) |  |  |
| T |  |  | 0.584 | 1.047(0.889-1.232) |  |  |
| rs3733359 | AA | 82(12.4) | 83(10.6) | 0.500 | 0.387  1.164(0.825-1.640) | 0.677  0.988(0.802-1.218) | 0.590  1.195(0.864-1.653) |
| AG | 294(44.3) | 365(46.4) |  | 0.638  0.949(0.761-1.182) |  |  |
| GG | 287(43.3) | 338(43) |  |  |  |  |
| A |  |  | 0.665 | 1.035(0.886-1.208) |  |  |
| rs6013897 | AA | 26(3.0) | 16(2.0) | 0.383 |  | 0.648  0.948(0.753-1.193) | 0.254  1.473(0.757-2.865) |
| AT | 163(24.1) | 206(26.1) |  | 0.193  0.633(0.318-1.260) |  |  |
| TT | 494(73) | 568(71.9) |  | 0.287  0.696(0.357-1.357) |  |  |
| T |  |  | 0.958 | 1.005(0.822-1.230) |  |  |
| rs22826798 | GG | 58(8.5) | 78(9.9) | 0.304 |  | 0.142  0.857(0.698-1.053) | 0.364  0.848(0.594-1.211) |
| GT | 277(40.8) | 340(43.3) |  | 0.633  1.096(0.753-1.594) |  |  |
| TT | 344(50.7) | 368(46.8) |  | 0.226  1.257(0.868-1.820) |  |  |
| T |  |  | 0.126 | 1.313(0.966-1.325) |  |  |
| rs2060793 | AA | 96(14.4) | 107(13.7) | 0.231 | 0.322  1.177(0.853-1.624) | 0.089  1.203(0.972-1.488) | 0.703  1.060(0.787-1.426) |
| AG | 325(48.9) | 352(45.2) |  | 0.095  1.211(0.967-1.516) |  |  |
| GG | 244(36.7) | 320(41.1) |  |  |  |  |
| A |  |  | 0.159  . | 1.115(0.958-1.297) |  |  |
| rs10741657 | AA | 91(13.9) | 104(13.3) | 0.266 | 0.362  1.164(0.839-1.615) | 0.106  1.192(0.963-1.475) | 0.736  1.053(0.778-1.426) |
| AG | 322(49.2) | 357(45.6) |  | 0.112  1.200(0.959-1.503) |  |  |
| GG | 242(36.9) | 322(41.1) |  |  |  |  |
| A |  |  | 0.184 | 1.109(0.952-1.292) |  |  |
| rs16847024 | CC | 484(75.4) | 532(75.8) | 0.827 | 1 | 0.867  1.022(0.796-1.311) | 0.538  1.256(0.608-2.594) |
| CT | 142(22.1) | 156(22.2) |  | 0.997  1.001(0.773-1.296) |  |  |
| TT | 16(2.5) | 14(2.0) |  | 0.539  1.256(0.607-2.601) |  |  |
| T |  |  | 0.739 | 1.038(0.834-1.291) |  |  |