**Online-Only Supplemental Material**

**Supplemental Table 1. List of participating study sites**

Columbia University

Christiana Care Health Systems

Saint Peters University Hospital

New York Hospital Queens

Medical University of South Carolina

University of Alabama

Northwestern University

University of California at Irvine Medical Center

Long Beach Memorial Medical Center

Fountain Valley Regional Medical Center

Women and Infants Hopsital Rhode Island

Tufts University

Supplemental Table 2. Characteristics of prospective studies on SHBG levels and GDM risk

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Source | Country | GW | Sample size | | Age | | | Pre-pregnancy BMI | | SHBG concentration (nmol/L) | | |  |
| GDM | Non-GDM | | GDM | Non-GDM | GDM | Non-GDM | | GDM | Non-GDM | Covariates adjusted |
| Thadhani R,*et al.* 17 (2003) | U.S. | 14–17 | 44 | 94 | | 32.4 | 32.6 | 28.0 | 25.0 | | 187 ± 82 | 233 ± 82 | - |
| Smirnakis KV,*et al.*18(2007) | U.S. | 11.0 ± 2.9 | 35 | 73 | | 33.6 | 31.4 | 29.0 | 26.0 | | 185 ± 105 | 256 ± 92 | - |
| Nanda S,*et al.*19 (2011) | U.K. | 11–13 | 80 | 300 | | 33.8 | 32.2 | 28.2a | 23.6a | | 225 ± 89\* | 300 ± 102\* | - |
| Caglar GS, *et al.* 20(2012) | Turkey | 13–16 | 30 | 63 | | 30.4 | 27.5 | - | - | | 98 ± 3 | 100 ± 4 | - |
| Rasanen JP,*et al.*29 (2013) | Finland | 5–13 | 90 | 92 | | 31.3 | 26.2 | - | - | | 84 ± 46 | 91 ± 66 | - |
| Maged AM,*et al.*21 (2014) | Egypt | 11.2 ± 1.7 | 27 | 242 | | 26.9 | 27.2 | 25.1 | 25.1 | | 191 ± 24 | 211 ± 28 | - |
| Kumru P,*et al.*22 (2016) | Turkey | 6–13 | 38 | 295 | | 28.6 | 27.8 | 24.9 | 23.3 | | 196 ± 98 | 281 ± 93 | Age, first trimester BMI, and mean arterial pressure |
| Theriault S,*et al.*23 (2016) | Canada | < 14 | 264 | 528 | | 30.8 | 29.3 | 26.1 | 22.7 | | 357 ± 160 | 411 ± 176 | HbA1c, pre-pregnancy BMI, history of GDM, family history of diabetes, soft drink intake before pregnancy |
| White SL,*et al.*25(2016) | U.K. | 15–18 | 337 | 966 | | 32 | 30.3 | 36.2 | 34.7 | | 387 ± 110 | 437 ± 128 | Age, sum of skinfold thicknesses, neck: thigh ratio, systolic blood pressure, HbA1c, random glucose, fructosamine, adiponectin, triglycerides |
| Berggren EK, *et al.* 24(2017) | U.S. | 11–14 | 14 | 231 | | - | - | 30.1 | 27.6 | | 228 ± 72 | 288 ± 93 | HbA1c, race, BMI, history of GDM |
| Li *et al.* † | U.S. | 10–14 | 104 | 214 | | 30.5 | 30.4 | 28.1 | 25.6 | | 204 ± 98 | 221 ± 103 | Age, parity, gestational week, pre-pregnancy BMI, family history of diabetes |

SHBG: Sex hormone-binding globulin; GDM: Gestational diabetes; GW:Gestational weeks;BMI: Body mass index; HbA1c: Hemoglobin A1c.

\*Calculated using median and interquartile range.

†The current study.

-: Not applicable.

Supplemental Table 3. SHBG concentrations at gestational weeks 10–14 by women's characteristics among non-GDM controls in the NICHD Fetal Growth Studies-Singleton Cohort

|  |  |  |  |
| --- | --- | --- | --- |
| Items | *n* | SHBG concentration  mean *± SD* | *P*\* |
| Age( years) |  |  |  |
| 18–19 | 5 | 162.5 ± 112.0 | 0.84 |
| 20–24 | 31 | 220.0 ± 92.0 |  |
| 25–29 | 58 | 226.6 ± 108.5 |  |
| 30–34 | 65 | 221.2 ± 92.6 |  |
| 35–39 | 52 | 222.3 ± 113.3 |  |
| ≥ 40 | 3 | 189.9 ± 134.7 |  |
| Race/ethnicity |  |  | <0.01 |
| Non-Hispanic white | 50 | 214.3 ± 91.1 |  |
| Non-Hispanic black | 30 | 202.8 ± 105.7 |  |
| Hispanic | 82 | 205.0 ± 103.0 |  |
| Asian/Pacific Islander | 52 | 262.9 ± 101.3 |  |
| Education |  |  | 0.47 |
| Less than high-school | 26 | 199.9 ± 126.6 |  |
| High-school graduate or equivalent | 23 | 234.0 ± 120.7 |  |
| More than high-school | 165 | 222.4 ± 95.7 |  |
| Married/living with a partner |  |  | 0.39 |
| Yes | 167 | 217.8 ± 103.8 |  |
| No | 47 | 232.2 ± 98.1 |  |
| Nulliparous |  |  | 0.67 |
| Yes | 96 | 224.3 ± 102.6 |  |
| No | 118 | 218.2 ± 102.8 |  |
| Infant sex |  |  | 0.21 |
| Male | 112 | 229.5 ± 99.0 |  |
| Female | 100 | 211.6 ± 105.9 |  |
| Unknown/Missing | 2 | 208.1 ± 146.0 |  |
| Family history of diabetes |  |  | 0.29 |
| Yes | 48 | 201.6 ± 95.3 |  |
| No | 164 | 226.1 ± 104.6 |  |
| Unknown/Missing | 2 | 264.4 ± 49.4 |  |
| Pre-pregnancy BMI |  |  | <0.01 |
| < 25.0 kg/m2 | 123 | 244.3 ± 99.4 |  |
| 25.0–29.9 kg/m2 | 56 | 207.1 ± 98.1 |  |
| ≥ 30.0 kg/m2 | 33 | 157.7 ± 89.9 |  |
| Unknown/Missing | 2 | 213.8 ± 183.6 |  |

SHBG: Sex hormone-binding globulin; GDM: Gestational diabetes; NICHD: National Institute of Child Health and Human Development; *SD*:Standard deviation; BMI: Body mass index.

\**P* was estimated using ANOVA.