**MOON RJ et al: Maternal and fetal genetic variation in vitamin D metabolism and umbilical cord blood 25-hydroxyvitamin D**

**Supplemental Tables and Figures**

**Supplementary Table 1:** Characteristics of mothers and offspring included in the SWS analysis and those not included (without a measure of umbilical cord blood 25(OH)D)

|  |  |  |  |
| --- | --- | --- | --- |
|  | SWS Not included (n=1140) | SWS Included (n=847) | p |
| Age (years), mean (SD) | 27.6 (3.8) | 28.4 (3.8) | <0.001 |
| Late pregnancy smoking, n (%) | 180 (17.1) | 85 (10.8) | <0.001 |
| Educational attainment ≥ A level (high school), n (%) | 631 (55.5) | 512 (60.7) | 0.02 |
| Pre-pregnancy BMI (kg/m2), mean (SD) | 25.2 (4.7) | 25.5 (4.9) | 0.17 |
| Pregnancy weight gain (kg), mean (SD) | 10.6 (4.2) | 10.6 (4.2) | 0.88 |
| Late pregnancy triceps skinfold thickness (mm), mean (SD) | 21.6 (6.7) | 21.7 (7.0) | 0.76 |
| Parity 1+, n(%) | 594 (52.2) | 426 (50.4) | 0.43 |
| White ethnicity, n(%) | 1092 (95.8) | 817 (96.5) | 0.45 |
| Early pregnancy 25(OH)D, nmol/l | 64.2 (26.0) | 61.1 (25.5) | 0.02 |
| Late pregnancy 25(OH)D, nmol/l | 61.8 (30.6) | 68.6 (31.3) | <0.001 |
| Vitamin D supplement use in late pregnancy, n(%) | 486 (46.1) | 417 (52.7) | 0.005 |
| **Offspring** |  |  |  |  |
| Female, n (%) | 555 (48.7) | 399 (47.1) | 0.49 |
| Gestation at birth (weeks), median (IQR) | 40.1 (39.1,41.0) | 40.1 (39.1,41.1) | 0.77 |
| Birthweight (g), mean (SD) | 3456 (516) | 3503 (513) | 0.04 |
| Umbilical cord blood 25(OH)D, nmol/l | - | 31.9 (18.3) |  |

**Supplementary Table 2**: Genotype frequencies in mothers and offspring included in the SWS cohort

|  |  |  |
| --- | --- | --- |
|  | MothersN (%) | OffspringN (%) |
| rs12785878 (*DHCR7*), n(%) |  |  |
|  | G:G | 45 (7.1) | 62 (7.8) |
|  | T:G | 209 (33.1) | 258 (32.5) |
|  | T:T | 378 (59.8) | 474 (59.7) |
| rs10741657 (*CYP2R1*), n (%) |  |  |
|  | A:A | 91 (14.4) | 121 (15.2) |
|  | G:A | 319 (50.4) | 395 (49.7) |
|  | G:G | 223 (35.2) | 279 (35.1) |
| rs6013897 (*CYP24A1*), n (%) |  |  |
|  | A:A | 18 (2.9) | 40 (5.0) |
|  | T:A | 213 (33.7) | 238 (30.0) |
|  | T:T | 401 (63.5) | 516 (65.0) |
| rs2282679 (*GC*), n (%) |  |  |
|  | C:C | 54 (8.5) | 61 (7.8) |
|  | C:A | 263 (41.6) | 342 (43.0) |
|   | A:A | 316 (49.9) | 392 (49.3) |

**Supplementary Table 3:** Characteristics of mothers and offspring included in the MAVIDOS analysis and those not included

|  |  |  |  |
| --- | --- | --- | --- |
|  | MAVIDOS Not included | MAVIDOS Included | p |
| n | 615 | 350 |  |
| Age (years), mean (SD) | 30.6 (5.1) | 30.9 (5.2) | 0.48 |
| Late pregnancy smoking, n (%) | 41 (7.6) | 17 (5.7) | 0.31 |
| Educational attainment ≥ A level (high school), n (%) | 459 (77.4) | 258 (77.7) | 0.91 |
| Pre-pregnancy BMI (kg/m2), mean (SD) | 26.3 (5.0) | 26.3 (5.0) | 0.81 |
| Pregnancy weight gain (kg), mean (SD) | 9.5 (3.6) | 9.6 (3.7) | 0.75 |
| Late pregnancy triceps skinfold thickness (mm), mean (SD) | 21.8 (6.7) | 22.1 (7.5) | 0.57 |
| Parity 1+, n(%) | 327 (55.1) | 197 (59.3) | 0.21 |
| Early pregnancy 25(OH)D (nmol/l) | 46.2 (17.6) | 46.4 (16.3) | 0.84 |
| White ethnicity, n(%) | 563 (94.8) | 317 (94.9) | 0.93 |
| Compliance with study medication (%), median (IQR) | 95.5 (88.2,98.9) | 95.6 (88.6,98.9) | 0.95 |
| **Offspring** |  |  |  |  |
| Female, n (%) | 276 (44.9) | 172 (49.1) | 0.20 |
| Gestation at birth (weeks), median (IQR) | 40.3 (39.3,41.0) | 40.1 (39.1,40.9) | 0.69 |
| Birthweight (g), mean (SD) | 3463 (563) | 3565 (459) | 0.004 |

**Supplementary Table 4**: Characteristics of participants in the MAVDIOS study

|  |  |  |
| --- | --- | --- |
|  | Placebo | Cholecalciferol 1000 iu/day |
| n | 185 | 165 |
| Age (years), mean (SD) | 30.8 (5.4) | 30.9 (5.0) |
| Late pregnancy smoking, n (%) |  8 (5.0) | 9 (6.5) |
| Educational attainment ≥ A level (high school), n (%) | 132 (75.9) | 126 (79.8) |
| Pre-pregnancy BMI (kg/m2), mean (SD) | 26.5 (5.1) | 26.2 (4.8) |
| Pregnancy weight gain (kg), mean (SD) | 9.9 (3.7) | 9.2 (3.7) |
| Late pregnancy triceps skinfold thickness (mm), mean (SD) | 22.7 (7.6) | 21.5 (7.3) |
| Parity 1+, n(%) | 96 (54.6) | 101 (64.7) |
| White ethnicity, n(%) | 165 (93.8) | 152 (96.2) |
| Compliance with study medication (%), median (IQR) | 93.7 (88.2,98.9) | 96.3 (90.2,98.9) |
| Early pregnancy 25(OH)D (nmol/l) | 46.5 (16.3) | 46.2 (16.4) |
| Late pregnancy 25(OH)D (nmol/l) | 44.0 (24.2) | 70.7 (22.9) |
| **Maternal genotype** |  |  |
| rs12785878 (*DHCR7*), n(%) |  |  |
|  | G:G | 16 (9.3) | 8 (5.1) |
|  | T:G | 59 (34.1) | 61 (39.1) |
|  | T:T | 98 (56.7) | 87 (55.8) |
| rs10741657 (*CYP2R1*), n (%) |  |  |
|  | A:A | 21 (12.4) | 22 (14.0) |
|  | G:A | 85 (50.0) | 72 (45.9) |
|  | G:G | 64 (37.7) | 63 (40.1) |
| rs6013897 (*CYP24A1*), n (%) |  |  |
|  | A:A | 9 (5.3) | 8 (5.2) |
|  | T:A | 58 (33.9) | 40 (25.8) |
|  | T:T | 104 (60.8) | 107 (69.0) |
| rs2282679 (*GC*), n (%) |  |  |
|  | C:C | 18 (10.5) | 15 (9.6) |
|  | C:A | 78 (45.6) | 70 (44.9) |
|   | A:A | 75 (43.9) | 71 (45.5) |
| **Offspring** |  |  |  |
| Female, n (%) | 94 (50.8) | 78 (47.3) |
| Gestation at birth (weeks), median (IQR) | 40.3 (39.3,41.0) | 40.1 (39.1,40.9) |
| Birthweight (g), mean (SD) | 3546 (484) | 3586 (429) |
| Umbilical cord blood 25(OH)D (nmol/l) | 28.6 (12.1) | 42.3 (13.1) |
| **Offspring genotype** |  |  |
| rs12785878 (*DHCR7*), n(%) |  |  |
|  | G:G | 9 (5.6) | 9 (6.3) |
|  | T:G | 58 (35.8) | 56 (39.2) |
|  | T:T | 95 (58.6) | 78 (54.6) |
| rs10741657 (*CYP2R1*), n (%) |  |  |
|  | A:A | 27 (17.2) | 17 (11.8) |
|  | G:A | 79 (50.3) | 63 (43.8) |
|  | G:G | 51 (32.5) | 64 (44.4) |
| rs6013897 (*CYP24A1*), n (%) |  |  |
|  | A:A | 4 (2.5) | 2 (1.4) |
|  | T:A | 53 (33.5) | 39 (27.1) |
|  | T:T | 101 (63.9) | 103 (71.5) |
| rs2282679 (*GC*), n (%) |  |  |
|  | C:C | 17 (10.5) | 12 (8.5) |
|  | C:A | 69 (42.6) | 64 (45.1) |
|  | A:A | 76 (46.9) | 66 (46.5) |

**Supplementary Figure 1:** Meta-analysis of associations of (A) maternal and (B) offspring genotype at rs10741657 and rs6013897 with umbilical cord blood 25(OH)D



**Supplementary Figure 2:** Meta-analysis of associations of (A) maternal adjusted for offspring genotype and (B) offspring adjusted for maternal genotype at rs10741657 and rs6013897 with umbilical cord blood 25(OH)D