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| **Table S1 Oocytes retrieval procedures of** **pregnancies carried to term** |
|  | **Singleton delivery** |  | **Multiple deliveries** |
|  | **E2 level on the day of hCG trigger (pmol/L）** | ***p*** |  | **E2 level on the day of hCG trigger (pmol/L)** | ***p*** |
|  | Group I:<10,000 | Group II:10,000-15,000  | Group III:>15,000 |  | Group I:<10,000 | Group II:10,000-15,000  | Group III:>15,000 |
|  | (N=886) | (N=523) | (N=821) |  | (N=178) | (N=167) | (N=302) |
|  | No. (%) | No. (%) | No. (%) | 　 | No. (%) | No. (%) | No. (%) |
| **COH protocol** |  |  |  |  |  |  |  |  |  |
| GnRH-agonist regimen | 291 (32.84) | 230 (43.98) | 384 (46.77) | <0.001 |  | 63 (35.39) | 66 (39.52) | 147 (48.68) | <0.001 |
| GnRH-antagonist regimen | 473 (53.39) | 271 (51.82) | 409 (49.82) |  |  | 90 (50.56) | 97 (58.08) | 148 (49.01) |  |
| Microflare protocol | 96 (10.84) | 21 (4.02) | 18 (2.19) |  |  | 22 (12.36) | 2 (1.20) | 5 (1.66) |  |
| Others | 26 (2.93) | 1 (0.19) | 10 (1.22) |  |  | 3 (1.69) | 2 (1.20) | 2 (0.66) |  |
| **Type of insemination** |  |  |  |  |  |  |  |  |  |
| IVF | 585 (66.03) | 347 (66.35) | 567 (69.06) | 0.185 |  | 130 (73.03) | 121 (72.46) | 214 (70.86) | 0.594 |
| ICSI | 301 (33.97) | 176 (33.65) | 254 (30.94) |  |  | 48 (26.97) | 46 (27.54) | 88 (29.14) |  |
| **Number of oocytes retrieved** |  |  |  |  |  |  |  |  |  |
| ≤10 | 466 (52.60) | 170 (32.50) | 122 (14.86) | <0.001 |  | 100 (56.18) | 43 (25.75) | 27 (8.94) | <0.001 |
| 11-20 | 285 (32.17) | 263 (50.29) | 405 (49.33) |  |  | 74 (41.57) | 98 (58.68) | 135 (44.70) |  |
| >20 | 135 (15.24) | 90 (17.21) | 294 (35.81) |  |  | 4 (2.25) | 26 (15.57) | 140 (46.36) |  |
| **Hormone level on the day of hCG trigger** |  |  |  |  |  |  |  |  |  |
| P4, Median (IQR), nmol/L | 3.0 (1.9-4.3) | 2.8 (2.3-3.8) | 2.8 (2.3-3.7) | 0.150 |  | 3.0 (1.9-4.0) | 2.9 (2.4-3.9) | 2.4 (1.8-2.9) | 0.065 |
| LH, Median (IQR), IU/L | 1.8 (1.1-4.0) | 2.1 (1.2-3.8) | 2.1 (1.2-3.7) | 0.614 |  | 1.8 (1.1-3.5) | 1.9 (1.1-3.0) | 1.8 (1.1-3.0) | 0.175 |
| COH, controlled ovarian stimulation; ART, assisted reproductive technology; IVF, in vitro fertilization; ICSI, intracytoplasmic sperm injection; P4, progesterone; LH, luteinizing hormone.. |

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| **Table S2 Frozen embryo transfer procedures of** **pregnancies carried to term** |
|  | **Singleton delivery** |  | **Multiple deliveries** |
|  | **E2 level on the day of hCG trigger (pmol/L）** | ***p*** |  | **E2 level on the day of hCG trigger (pmol/L)** | ***p*** |
|  | Group I:<10,000 | Group II:10,000-15,000  | Group III:>15,000 |  | Group I:<10,000 | Group II:10,000-15,000  | Group III:>15,000 |
|  | (N=886) | (N=523) | (N=821) |  | (N=178) | (N=167) | (N=302) |
|  | No. (%) | No. (%) | No. (%) |  | No. (%) | No. (%) | No. (%) |
| **Duration of embryo cryopreservation, months** |  |  |  |  |  |  |  |  |  |
| <3 | 451 (50.90) | 298 (56.98) | 436 (53.11) | 0.498 |  | 85 (47.75) | 73 (43.71) | 147 (48.68) | 0.608 |
| 3-6 | 257 (29.01) | 135 (25.81) | 237 (28.87) |  |  | 64 (35.96) | 66 (39.52) | 115 (38.08) |  |
| >6 | 178 (20.09) | 90 (17.21) | 148 (18.03) |  |  | 29 (16.29) | 28 (16.77) | 40 (13.25) |  |
| **Type of endometrium preparation** |  |  |  |  |  |  |  |  |  |
| Natural cycle | 412 (46.50) | 284 (54.30) | 394 (47.99) | 0.130 |  | 90 (50.56) | 82 (49.10) | 132 (43.71) | 0.108 |
| OS cycle | 85 (9.59) | 65 (12.43) | 98 (11.94) |  |  | 18 (10.11) | 16 (9.58) | 47 (15.56) |  |
| HRT cycle | 389 (43.19) | 174 (33.27) | 329 (40.07) |  |  | 70 (39.33) | 69 (41.32) | 123 (40.73) |  |
| **Day of embryo transfer** |  |  |  |  |  |  |  |  |  |
| Day3 | 682 (76.98) | 409 (78.20) | 637 (77.59) | 0.946 |  | 120 (67.42) | 114 (68.26) | 203 (67.22) | 0.952 |
| Day4 | 90 (10.16) | 51 (9.75) | 80 (9.74) |  |  | 32 (17.98) | 32 (19.16) | 53 (17.55) |  |
| Day5 | 114 (12.87) | 63 (12.05) | 12.67) |  |  | 26 (14.61) | 21 (12.57) | 46 (15.23) |  |
| **Number of embryo transferred** |  |  |  |  |  |  |  |  |  |
| 1 | 166 (18.74) | 75 (14.34) | 126 (15.35) | 0.056 |  | 2 (1.12) | 1 (0.60) | 0 (0.00) | 0.076 |
| 2 | 720 (81.26) | 448 (85.66) | 695 (84.65) |  |  | 176 (98.88) | 166 (99.40) | 302 (100.00) |  |
| **Endometrial thickness, Mean ± SD, mm** | 9.40 ± 1.46 | 9.55 ± 1.54 | 9.49 ± 1.51 | 0.210 |  | 9.45 ± 1.39 | 9.57 ± 1.45 | 9.67 ± 1.58 | 0.149 |
| **Hormone level before embryo transfer** |  |  |  |  |  |  |  |  |  |
| E2, Median (IQR), ×103 pmol/L | 1.29 (0.89-2.24) | 1.30 (0.87-2.19) | 1.35 (0.93-2.24) | 0.507 |  | 1.18 (0.89-1.83) | 1.38 (0.84-1.99) | 1.24 (0.93-1.80) | 0.424 |
| P4, Median (IQR), nmol/L | 2.3 (1.4-3.6) | 2.1 (1.4-3.2) | 2.3 (1.6-3.5) | 0.174 |  | 1.8 (1.2-3.0) | 1.7 (1.2-2.6) | 1.7 (1.1-2.4) | 0.255 |
| LH, Median (IQR), IU/L | 13.0 (7.9-23.5) | 14.2 (9.2-23.7) | 14.3 (8.7-23.4) | 0.154 |  | 10.7 (8.1-15.6) | 10.1 (7.7-16.2) | 10.6 (7.6-18.6) | 0.720 |
| FET, frozen embryo transfer; OS, ovarian stimulation; HRT, hormonal replace therapy; E2, estradiol; P4, progesterone; LH, luteinizing hormone. |

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| **Table S3 Outcomes of neonates born following transferring embryos with different E2 exposure** |
|  | **Singleton delivery** |  | **Multiple deliveries** |
|  | **E2 level on the day of hCG trigger (pmol/L)** | **aOR1 (95% CI)**\* | **aOR2 (95% CI)**\* |  | **E2 level on the day of hCG trigger (pmol/L)** | **aOR1 (95% CI)**\* | **aOR2 (95% CI)**\* |
|  | Group I:<10,000 | Group II:10,000-15,000 | Group III:>15,000 |  | Group I: <10,000 | Group II: 10,000-15,000 | Group III: >15,000 |
|  | No. (%) | No. (%) | No. (%) | Group II vs. I | Group III vs. I |  | No. (%) | No. (%) | No. (%) | Group II vs. I | Group III vs. I |
| **GnRH-agonist regimen** | (N=291) | (N=230) | (N=384) |  |  |  | (N=127) | (N=132) | (N=294) |  |  |
| **Gestational age, Mean ± SD, weeks** | 38.08 ± 1.67 | 37.84 ± 1.93 | 38.07 ± 1.73 |  |  |  | 35.94 ± 1.57 | 36.21 ± 1.56 | 35.56 ± 1.99 |  |  |
| **Gender** |  |  |  | 　 |  |  | 　 | 　 | 　 |  |  |
| Male | 157 (53.95) | 115 (50.00) | 191 (49.74) | Reference | Reference |  | 55 (43.31) | 69 (52.72) | 148 (50.34) | Reference | Reference |
| Female | 134 (46.05) | 115 (50.00) | 193 (50.26) | 1.14 (0.80-1.62) | 1.13 (0.81-1.58) |  | 72 (56.69) | 63 (47.73) | 146 (49.66) | 0.79 (0.47-1.31) | 0.95 (0.57-1.58) |
| **Birthweight** |  |  |  | 　 | 　 |  | 　 | 　 | 　 | 　 | 　 |
| <2500 g | 12 (4.12) | 16 (6.96) | 36 (9.38) | 1.35 (0.52-3.94) | 2.59 (1.10-6.08) |  | 56 (44.09) | 60 (45.45) | 160 (54.42) | 1.39 (0.80-2.42) | 1.84 (1.06-3.20) |
| 2500-4000g | 260 (89.35) | 203 (88.26) | 319 (83.07) | Reference | Reference |  | 71 (55.91) | 72 (54.55) | 134 (45.58) | Reference | Reference |
| >4000 g | 19 (6.53) | 11 (4.78) | 29 (7.55) | 0.76 (0.35-1.64) | 1.19 (0.62-2.29) |  | 0 (0.00) | 0 (0.00) | 0 (0.00) | NA | NA |
| **Birthweight for gestational age** |  |  |  |  |  |  | 　 | 　 | 　 | 　 | 　 |
| SGA | 15 (5.15) | 18 (7.83) | 48 (12.50) | 1.44 (0.70-2.97) | 2.16 (1.13-4.11) |  | 23 (18.11) | 29 (21.97) | 75 (25.51) | 1.21 (0.63-2.30) | 1.57 (0.83-2.93) |
| AGA | 226 (77.66) | 176 (76.52) | 263 (68.49) | Reference | Reference |  | 102 (80.31) | 101 (76.52) | 215 (73.13) | Reference | Reference |
| LGA | 50 (17.18) | 36 (15.16) | 73 (19.01) | 0.95 (0.59-1.54) | 1.08 (0.69-1.08) | 　 | 2 (1.57) | 2 (1.52) | 4 (1.36) | 0.67 (0.07-6.15) | 0.55 (0.02-15.24) |
| **GnRH-antagonist regimen** | (N=473) | (N=271) | (N=409) |  |  |  | (N=180) | (N=194) | (N=296) |  |  |
| **Gestational age, Mean ± SD, weeks** | 38.46 ± 1.57 | 38.23 ± 1.57 | 38.06 ± 2.02 |  |  |  | 35.84 ± 1.58 | 35.77 ± 1.71 | 35.77 ± 1.96 |  |  |
| **Gender** | 　 | 　 | 　 | 　 |  |  | 　 | 　 | 　 | 　 |  |
| Male | 234 (49.47) | 136 (50.18) | 228 (55.75) | Reference | Reference |  | 100 (55.56) | 102 (52.58) | 159 (53.72) | Reference | Reference |
| Female | 239 (50.53) | 135 (49.82) | 181 (44.25) | 0.99 (0.73-1.34) | 0.79 (0.60-1.05) |  | 80 (44.44) | 92 (47.42) | 137 (46.28) | 1.19 (0.77-1.83) | 1.14 (0.74-1.77) |
| **Birthweight** | 　 | 　 | 　 | 　 | 　 |  | 　 | 　 | 　 | 　 | 　 |
| <2500 g | 20 (4.23) | 15 (5.54) | 41 (10.02) | 1.14 (0.51-2.57) | 1.79 (0.91-3.52) |  | 82 (45.56) | 99 (51.03) | 150 (50.68) | 1.23 (0.72-2.12) | 1.35 (0.60-3.08) |
| 2500-4000g | 411 (86.69) | 233 (85.98) | 340 (83.13) | Reference | Reference |  | 98 (54.44) | 95 (48.97) | 146 (49.32) | Reference | Reference |
| >4000 g | 42 (8.88) | 23 (8.49) | 28 (6.85) | 1.13 (0.65-1.95) | 1.00 (0.58-1.71) |  | 0 (0.00) | 0 (0.00) | 0 (0.00) | NA | NA |
| **Birthweight for gestational age** | 　 | 　 | 　 | 　 | 　 |  |  |  |  | 　 | 　 |
| SGA | 24 (5.07) | 29 (10.70) | 52 (12.71) | 2.17 (1.22-3.87) | 2.40 (1.40-4.11) |  | 25 (13.89) | 35 (18.04) | 58 (19.59) | 1.52 (0.82-2.85) | 1.89 (0.74-4.82) |
| AGA | 361 (76.32) | 190 (70.11) | 300 (73.35) | Reference | Reference |  | 153 (85.00) | 157 (80.93) | 231 (78.04) | Reference | Reference |
| LGA | 88 (18.60) | 52 (19.19) | 57 (13.94) | 1.19 (0.80-1.77) | 0.85 (0.58-1.27) | 　 | 2 (1.11) | 2 (1.03) | 7 (2.36) | 0.56 (0.07-4.55) | 1.73 (0.29-10.51) |
| aOR, adjusted odds ratio; CI, confidence interval; NA, not accessible; AGA, appropriate for gestational age; SGA, small for gestational age; LGA, large for gestational age. |
| \* aOR was adjusted for age at embryo transfer, pre-gestational BMI, number of oocytes retrieved, number of embryo transferred, and preterm delivery. |