|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***Group\**** | ***N CS in group*** | ***Total N in group*** | ***Group Size (%)1*** | ***Group CS rate (%)2*** | ***Absolute group contribution to overall CS rate (%)3*** | ***Relative group contribution to overall CS rate (%)4*** | ***Percentage of women with obesity*** |
| ***1*** | 347 | 3572 | 24.2 | 9.7 | 2.3 | 13.8 | 11.6 |
| ***2*** | 387 | 1370 | 9.3 | 28.2 | 2.6 | 15.4 | 8.0 |
| *2a (Induced)*  | 317 | 1300 | 8.8 | 24.4 | 2.1 | 12.6 | 7.5 |
| *2b (Prelabor CS)*  | 70 | 70 | 0.5 | 100.0 | 0.5 | 2.8 | 0.5 |
| ***3*** | 111 | 4853 | 32.8 | 2.3 | 0.8 | 4.4 | 30.4 |
| ***4*** | 103 | 1086 | 7.3 | 9.5 | 0.7 | 4.1 | 11.7 |
| *4a (Induced)*  | 72 | 1055 | 7.1 | 6.8 | 0.5 | 2.9 | 11.4 |
| *4b (Prelabor CS)*  | 31 | 31 | 0.2 | 100.0 | 0.2 | 1.2 | 0.4 |
| ***5*** | 702 | 1733 | 11.7 | 40.5 | 4.7 | 28.0 | 22.0 |
| *5.a (1 CS)*  | 358 | 1380 | 9.3 | 25.9 | 2.4 | 14.3 | 15.6 |
| *5.b (> 1 CS)*  | 344 | 353 | 2.4 | 97.5 | 2.3 | 13.7 | 6.4 |
| ***6*** | 167 | 301 | 2.0 | 55.5 | 1.1 | 6.7 | 1.0 |
| ***7*** | 226 | 402 | 2.7 | 56.2 | 1.5 | 9.0 | 4.5 |
| ***8*** | 204 | 582 | 3.9 | 35.1 | 1.4 | 8.1 | 3.5 |
| ***9*** | 30 | 30 | 0.2 | 100.0 | 0.2 | 1.2 | 0.3 |
| ***10*** | 231 | 859 | 5.8 | 26.9 | 1.6 | 9.2 | 6.9 |
| ***Total***  | 2508 | 14788 | 100.0% | 17.0 | 17.0 | 100.0 | 100.0 |

**Table S1: Cesarean delivery profiles of the study population using Robson classification.**

\*See definitions in Table 2

**Table S2: Characteristics of group 5a women according to pre-pregancy BMI**

\* High medical risk level at the beginning of pregnancy was defined as the presence of one or more of: history of cardiac disease, hypertension, diabetes, venous
thrombosis, pulmonary embolism, Graves’ disease, asthma, homozygous sickle cell anemia, thrombocytopenia, coagulation disorder, a rare or systemic disease,
nephropathy, HIV infection, pre-eclampsia, growth restriction, preterm delivery, fetal death or neonatal death.

\*\* Defined as the occurrence of one or more of the following complications: gestational diabetes, gestational hypertension, pre-eclampsia, eclampsia, HELLP syndrome,
venous thrombosis, pulmonary embolism, severe sepsis, convulsions, diabetic ketoacidosis, coagulation disorder, cholestasis of pregnancy

\*\*\* Excessive total gestational weight gain defined as an intake of more than 9 kg for women with obesity and an intake of more than 15.9 kg for normal weight women.

|  |  |  |  |
| --- | --- | --- | --- |
|   | Normal weight | Obesity |   |
|   | 912 | 468 |   |
|   | N (%) | N (%) | p |
| **Maternal characteristics** |   |   |   |
| age (mean±sd) | 33.57±5.21 | 33.78±5.06 | 0.473 |
| age class  |   |   | 0.063 |
| < 25  |  52 (5.7)  |  13 (2.8)  |  |
|  [25.30[  |  178 (19.5)  |  107 (22.9)  |  |
|  [30;35[  |  315 (34.5)  |  160 (34.2)  |  |
|  [>= 35[  |  367 (40.2)  |  188 (40.2)  |  |
| Body mass index before pregnancy (kg/m²) (mean ± sd) | 21.76 (1.65) | 33.65 (3.80) | <0.001 |
| Smoker  |  119 (13.3)  |  45 (9.9)  | 0.087 |
| Diabetes mellitus  |  10 (1.1)  |  20 (4.3)  | <0.001 |
| Chronic hypertension  |  11 (1.2)  |  35 (7.5)  | <0.001 |
| Bariatric surgery |  |  | <0.001 |
| Bypass |  2 (0.2)  |  3 (0.6)  |  |
| Sleeve gastrectomy |  1 (0.1)  |  8 (1.7)  |  |
| Gastric band |  1 (0.1)  |  14 (3.0)  |  |
| Hight medical risk level at the beginning of pregnancy\* |  148 (16.2)  |  154 (32.9)  | <0.001 |
| **Pregnancy characteristics** |   |   |   |
| Complications of pregnancy\*\* |  97 (10.6)  |  138 (29.5)  | <0.001 |
| Weight intake during pregnancy (mean±sd) | 12.46±5.48 | 7.89±6.82 | <0.001 |
| Excessive total GWG\*\*\* |  232 (25.7)  |  211 (46.1)  | <0.001 |
| Gestational diabetes requiring insulin  |  21 (2.3)  |  48 (10.3)  | <0.001 |
| Gestational diabetes without insulin |  48 (5.3)  |  54 (11.5)  | <0.001 |
| In utero transfer |  2 (0.2)  |  0 (0.0)  | 0.79 |
| Premature rupture of membranes |  3 (0.3)  |  3 (0.6)  | 0.688 |
| Preterm labor  |  17 (1.9)  |  4 (0.9)  | 0.223 |
| Gestational hypertension  |  9 (1.0)  |  22 (4.7)  | <0.001 |
| Preeclampsia  |  16 (1.8)  |  22 (4.7)  | 0.003 |
| Suspected small for gestational age  |  16 (1.8)  |  6 (1.3)  | 0.663 |
| Cholestasis |  5 (0.5)  |  6 (1.3)  | 0.258 |
| **Delivery characteristics** |   |   |   |
| Gestational age at delivery  |   |   |  |
|  >=41 | 197 (21.6)  | 110 (23.5)  | 0.461 |
| Induction  | 201 (22.0)  | 158 (33.8)  | <0.001 |
| Induction indication  |  |  | <0.001 |
| Fetal |  55 (6.0)  |  43 (9.2)  | 0.04 |
|  Maternal |  15 (1.6)  |  20 (4.3)  | 0.005 |
| Premature rupture of membranes |  83 (9.1)  |  43 (9.2)  | 1 |
|  Post term |  27 (3.0)  |  28 (6.0)  | 0.01 |
| Gestational hypertension or preeclampsia |  20 (2.2)  |  23 (4.9)  | 0.009 |
|  Non medical |  1 (0.1)  |  1 (0.2)  | 1 |
| Delivery mode |  |  | <0.001 |
| Vaginal delivery | 708 (77.6)  | 314 (67.1)  |  |
| CS before labor |  44 (4.8)  |  32 (6.8)  |  |
| CS during labor | 160 (17.5)  | 122 (26.1)  |  |
| Cesarean section indication  |  |  |  |
|  Abnormal fetal heart rate |  86 (9.4)  |  64 (13.7)  | 0.02 |
|  Arrest of labor |  76 (8.3)  |  62 (13.2)  | 0.005 |
|  Cesarean scar |  20 (2.2)  |  12 (2.6)  | 0.8 |
|  Maternal |  10 (1.1)  |  6 (1.3)  | 0.97 |
|  Fetal indication or placenta malposition |  12 (1.3)  |  10 (2.1)  | 0.35 |

**Table S3: Association between maternal obesity and CS before labor for Robson group 5a N = 1380**

Abbreviations : OR odds ratio, aOR adjusted odds ratio, 95% CI 95% confidence interval

\*Logistic regression models including all variables in the column

\*\* see definitions in table 1

|  |  |
| --- | --- |
|   |  Cesarean section before labor versus trial of labor |
|   | OR [95% CI] | aOR\* [95% CI] |
| Age > 35 | 0.91 [0.56-1.47] | 0.85 [0.52-1.37] |
| Obesity | 1.45 [0.90-2.31] | 1.26 [0.76-2.08] |
| Hight medical risk level at the beginning of pregnancy\*\* | 0.87 [0.49-1.56] | 0.77 [0.43-1.40] |
| Complications of pregnancy\*\* | 2.23 [1.34-3.73] | 2.17 [1.27-3.73] |

**Table S4 : Association between maternal obesity and CS during labor for Robson group 5a N = 1304**

Abbreviations : OR odds ratio, aOR adjusted odds ratio, 95% CI 95% confidence interval

\*Logistic regression models including all variables in the column

\*\* see definitions in table 1

|  |  |
| --- | --- |
|   |  Cesarean section during labor versus vaginal delivery |
|   | OR [95% CI] | aOR\* [95% CI] |
| Age > 35 | 1.08 [0.83-1.41] | 1.02 [0.77-1.34] |
| Obesity | 1.72 [1.31-2.25] | 1.43 [1.07-1.9] |
| Induction | 2.01 [1.52-2.67] | 1.82 [1.36-2.43] |
| Hight medical risk level at the beginning of pregnancy\*\* | 1.31 [0.97-1.79] | 1.19 [0.86-1.63] |
| Complications of pregnancy\*\* | 1.99 [1.44-2.75] | 1.60 [1.14-2.26] |

**Table S5: neonatal outcomes of twin pregnancies according to maternal pre-pregnancy BMI**

|  |  |  |  |
| --- | --- | --- | --- |
|   | Normal weight | Obesity |  p  |
|   | N=481 | N=105 |   |
|   | N (%) | N (%) |   |
| Birth weight J1 (grams) (mean±sd) | 2338±570 | 2410±663 | 0.258 |
| Birth weight J1 (grams)  |   |   | 0.014 |
|  [2500-3800[ |  203 (42.2)  |  55 (52.4)  |  |
|  < 2500 |  278 (57.8)  |  49 (46.7)  |  |
|  > 3800 |  0 (0.0)  |  1 (1.0)  |  |
| Birth weight J2 (grams) (mean±sd) | 2275±549 | 2387±676 | 0.073 |
| Birth weight J2 (grams) |   |   | 0.006 |
|  [2500-3800[ |  182 (38.0)  |  52 (50.0)  |  |
|  < 2500 |  297 (62.0)  |  51 (49.0)  |  |
|  > 3800 |  0 (0.0)  |  1 (1.0)  |  |
| pH at umbilical cord J1  |   |   | 0.331 |
|  pH < 7 | 0 | 0 |  |
|  pH [7-7,1] |  5 (1.1)  |  0 (0.0)  |  |
|  pH ]7.1-7.2[ |  17 (3.6)  |  6 (5.9)  |  |
|  pH ≥ 7.2 |  449 (95.3)  |  95 (94.1)  |  |
| pH at umbilical cord J2  |   |   | 0.61 |
|  pH < 7 |  2 (0.4)  |  0 (0.0)  |  |
|  pH [7-7,1] |  4 (0.8)  |  2 (2.0)  |  |
|  pH ]7.1-7.2[ |  17 (3.6)  |  5 (4.9)  |  |
|  pH ≥ 7.2 |  448 (95.1)  |  95 (93.1)  |  |
| Apgar score < 7 at 5 minutes J1  |  5 (1.0)  |  5 (4.8)  | 0.024 |
| Apgar score < 7 at 5 minutes J2  |  12 (2.5)  |  4 (3.8)  | 0.669 |
| Transfer place J1  |   |   | 0.252 |
| Neonatal reanimation unit |  114 (23.8)  |  16 (15.2)  |  |
| Intensive care unit |  98 (20.4)  |  26 (24.8)  |  |
| Other specialized services |  1 (0.2)  |  0 (0.0)  |  |
| Transfer place J2  |  |  | 0.26 |
| Neonatal reanimation unit |  109 (22.7)  |  16 (15.2)  |  |
| Intensive care unit |  120 (25.0)  |  32 (30.5)  |  |
| Other specialized services |  3 (0.6)  |  0 (0.0)  |   |