

L'expérience professionnelle de l'opérateur lors d'une extraction instrumentale affecte-t-elle l'état de santé maternel et néonatal ?

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Contexte et Objectifs

- Extractions instrumentales = 12-15% des naissances
 - Recommandations ACOG, RCOG, SOGC = Geste réservé aux « expérimentés »
 - Apprentissage difficile :
 - Geste risqué réalisé à l'aveugle
 - « Risque » médico-légal
 - USA : Extractions = 3,14% (0,56% Forceps/Spatules et 2,58% Ventouse)^[1]
- ➔ Risque de perte d'expérience par diminution du taux d'extractions
- ➔ Augmentation du taux de césarienne/morbidité maternelle

Objectif :

Déterminer si l'expérience professionnelle de l'opérateur lors d'une tentative d'accouchement instrumental par voie basse (TAIVB) affecte l'état de santé maternel et néonatal.

^[1] Births: Final Data for 2015. Joyce et al. National vital statistics reports.

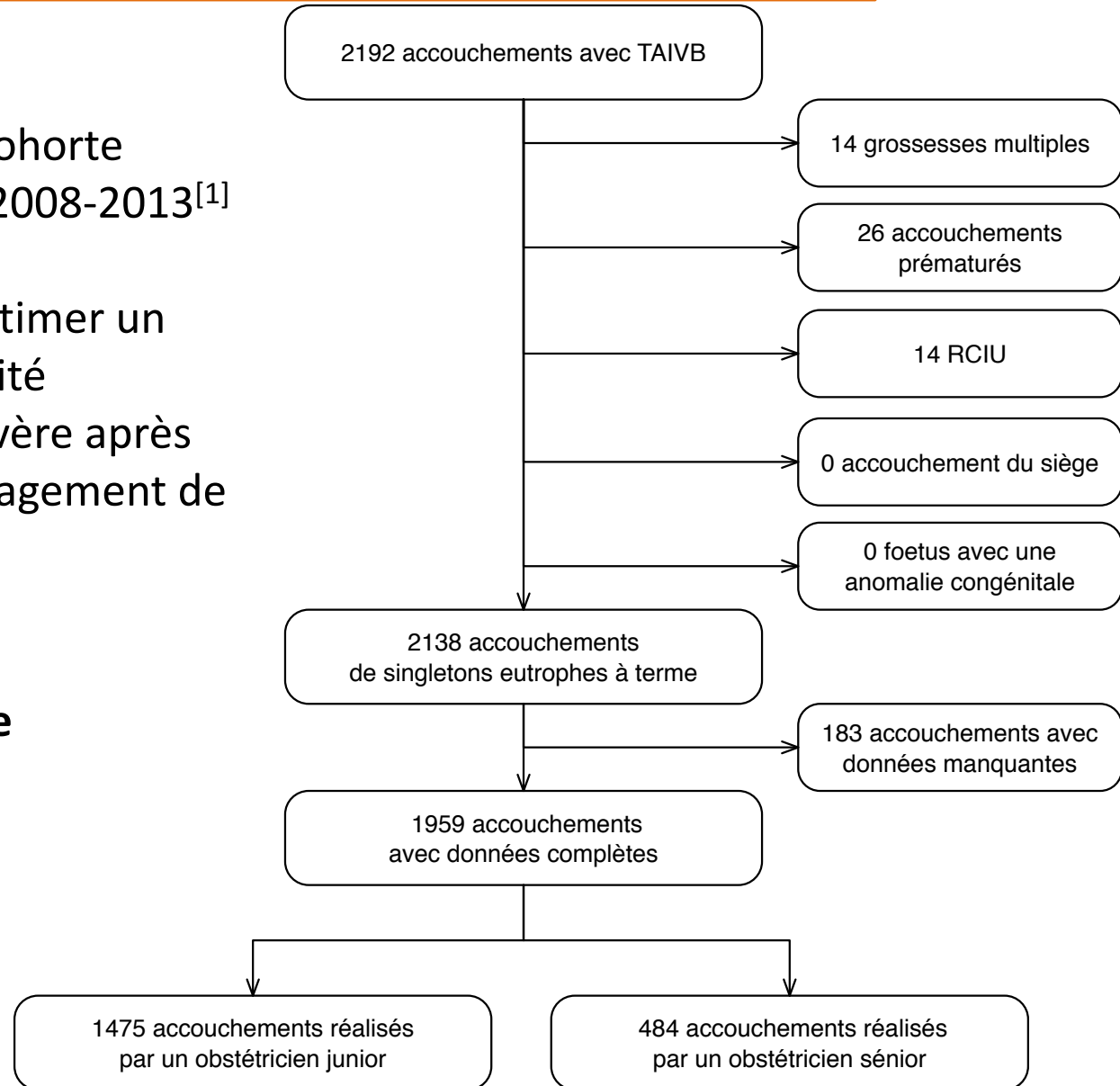
Population

Analyse secondaire d'une cohorte prospective en population 2008-2013^[1]

Design initial conçu pour estimer un score composite de morbidité maternelle et néonatale sévère après TAIVB selon le niveau d'engagement de la présentation

2138 TAIVB
Singletons, vivants, à terme
Présentation céphalique

Junior = Internes
Sénior = CCA/PH/PUPH



^[1] Maternal and neonatal morbidity after attempted operative vaginal delivery according to fetal head station. Ducarme, Sentilhes. Obstetrics&Gynecology 2015.

Analyse

- Décisions et modes d'extraction laissé à discrétion de l'obstétricien
- Extraction partie haute : 391/2138 (18,3%)
- **Extraction partie moyenne : 1550/2138 (72,5%)**
- Extraction partie basse : 197/2138 (9,2%)
- **Morbidité maternelle** : déchirure périnéale \geq 3-4^e degré, hématome périnéal, déchirure cervicale, hystérotomie élargie en cas de césarienne, HPP > 1500 mL, chirurgie d'hémostase, embolisation des artères utérines, transfusion sanguine, infection, embolie, admission en soins intensifs, décès maternel
- **Morbidité néonatale** : APGAR < 7 à 5', pH artères ombilicale < 7,00, gestes de réanimation, traumatisme néonatal, HIV grade \geq 2, admission en soins intensifs > 24h, convulsions, sepsis, mort néonatale
- Régressions logistiques **univariée et multivariée**
- Analyse sur cas complet et avec **imputation multiple**
- Analyse après appariement sur **score de propension**

Différences maternelles

Différences maternelles entre les TAIVB selon le niveau d'expérience de l'obstétricien

	Junior N = 1475 (75,3%) n (%)	Sénior N = 484 (24,7%) n (%)	P
IMC avant grossesse (kg/m ²)	21,8 (19,9-24,3)	22,2 (20,3-25,0)	0,01
Variété non antérieure	151 (10,2%)	81 (16,7%)	< 0,01
Rotation manuelle	133 (9,1%)	80 (16,7%)	< 0,01
TAIVB partie haute	166 (11,3%)	183 (37,8%)	< 0,01
Forceps ou Spatules	938 (63,6%)	422 (87,1%)	< 0,01
Echec d'EI	2 (0,1%)	30 (6,2%)	< 0,01
Délivrance artificielle	164 (19,8%)	82 (28,4%)	< 0,01
HPP	232 (15,7%)	98 (20,3%)	0,03
Transfusion sanguine	20 (1,4%)	16 (3,3%)	0,01

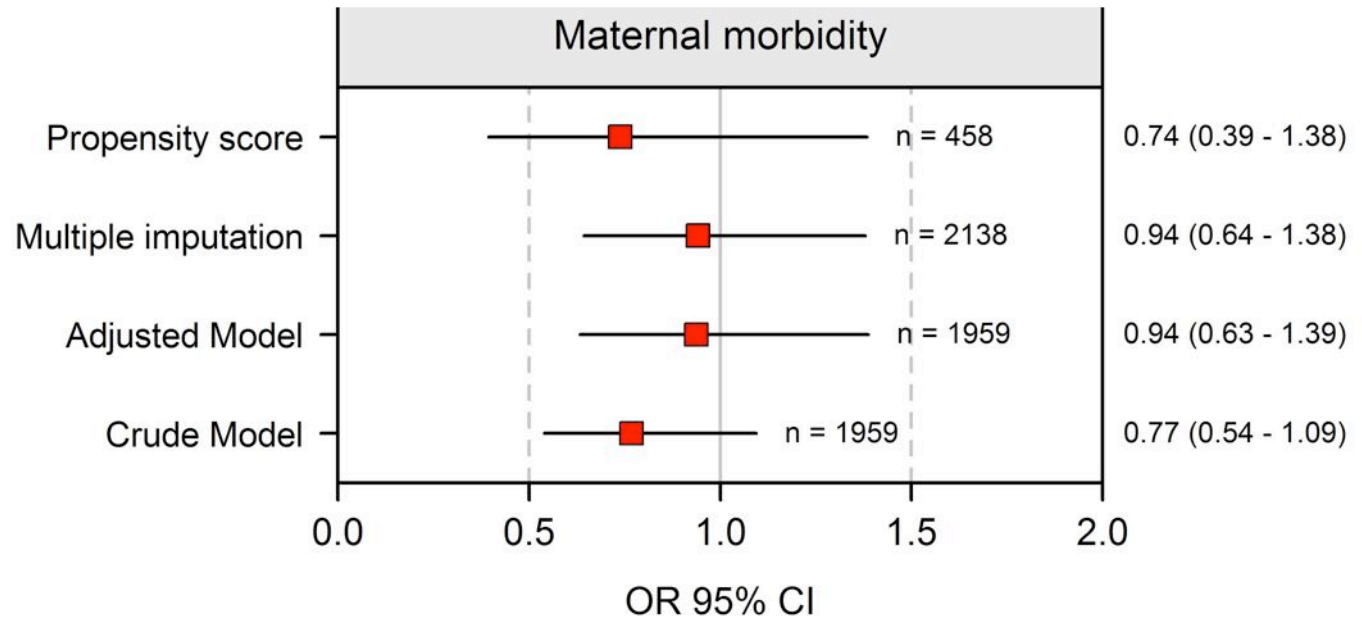
Différences néonatales

Différences néonatales entre les TAIVB selon le niveau d'expérience de l'obstétricien

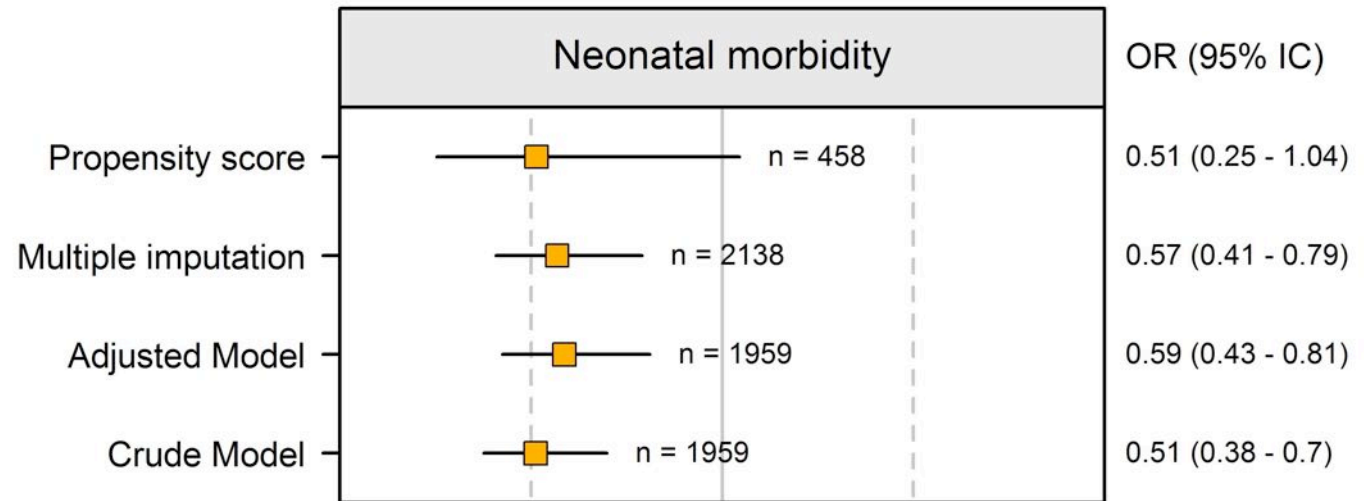
	Junior N = 1475 (75,3%) n (%)	Sénior N = 484 (24,7%) n (%)	P
Hospitalisation USI	61 (4,1%)	33 (6,8%)	0,02
Hématome du cuir chevelu	20 (1,4%)	26 (5,4%)	< 0,01
Lacération du scalp	66 (4,5%)	42 (8,7%)	< 0,01
Sepsis	10 (0,7%)	9 (1,9%)	0,04
Morbidité sévère	123 (8,3%)	73 (15,1%)	< 0,01

Morbidité maternelle

La morbidité maternelle sévère en cas de TAIVB n'était jamais associée à l'expérience de l'opérateur.



Morbidité néonatale



La morbidité néonatale sévère était significativement diminuée lors de TAIVB réalisées par un obstétricien junior (analyses brute, ajustée et avec imputation multiple) mais cette association n'était pas retrouvée après appariement sur le score de propension.

Conclusion

- **TAIVB réalisée par un obstétricien junior :**
 - ne semble **pas** augmenter la morbidité **maternelle** sévère
 - ne semble **pas** augmenter la morbidité **néonatale** sévère.
- Sous la **surveillance** d'un obstétricien sénior
- TAIVB réalisée par un obstétricien **sénior** concerne des « cas plus **difficiles** »
- **Résultats rassurants incitant à poursuivre l'enseignement des EI**

Merci pour votre attention

Variables	Obstetric registrar N= 1,475 n (%)	Senior attending obstetrician N = 484 n (%)	P \$
Maternal and labor characteristics			
Age (y)	28 (25,31)	28 (25,32)	0.0631
BMI before pregnancy (kg/m ²)	21.8 (19.95,24.33)	22.19 (20.31,25.02)	0.0143
Nulliparity	1099 (74.51)	358 (73.97)	0.8597
Previous cesarean delivery	151 (10.24)	54 (11.16)	0.6255
Previous birth weight more than 4,000 g	14 (3.75)	8 (6.35)	0.3290
Gestational diabetes mellitus	84 (5.75)	30 (6.24)	0.1969
Prenatal suspicion of macrosomia*	91 (6.17)	31 (6.4)	0.9381
Gestational age at delivery (wk)	40 (39,40)	40 (39,40)	0.8806
Induced labor	257 (17.42)	92 (19.01)	0.4703
Second stage longer than 3 h	197 (13.36)	75 (15.5)	0.2689
Active phase of second stage longer than 30 min	501 (33.97)	125 (25.83)	0.0011
Dose of oxytocin (milli-international units)	900 (200,2260)	1110 (247.5,2620)	0.0379
Epidural analgesia	1386 (93.97)	452 (93.39)	0.7269
Manual rotation	133 (9.12)	80 (16.74)	< 0.001
Persistent occiput			
<i>Anterior</i>	1324 (89.76)	403 (83.26)	
<i>Posterior</i>	113 (7.66)	65 (13.43)	< 0.001
<i>Transverse</i>	38 (2.58)	16 (3.31)	
Indication for operative vaginal delivery			
<i>Nonreassuring FHR only</i>	613 (41.56)	221 (45.66)	
<i>Arrested progress only</i>	563 (38.17)	169 (34.92)	0.2721
<i>Nonreassuring FHR and arrested progress</i>	299 (20.27)	94 (19.42)	
Fetal Head Station			
Outlet	157 (10.64)	21 (4.34)	
Low	1152 (78.1)	280 (57.85)	< 0.001
Mid	166 (11.25)	183 (37.81)	
Instrument type			
<i>Vacuum</i>	589 (39.93)	87 (17.98)	
<i>Forceps</i>	34 (2.31)	77 (15.91)	< 0.001
<i>Spatula</i>	904 (61.29)	345 (71.28)	
Sequential use of 2 instruments	46 (3.12)	24 (4.96)	0.0799
Rotational forceps delivery	133 (9.12)	80 (16.74)	< 0.001

Variables	Obstetric registrar N = 1,475 n (%)	Senior attending obstetrician N = 484 n (%)	P \$
Maternal outcome			
Cesarean delivery after failed operative vaginal delivery	2 (0.14)	30 (6.2)	< 0.001
Extended uterine incision for cesarean delivery	0 (0)	6 (19.35)	0.7935
Episiotomy	1296 (87.86)	416 (86.49)	0.4748
Third- or fourth-degree perineal laceration	40 (2.72)	13 (2.71)	0.999
Perineal hematoma	1 (0.07)	1 (0.21)	0.9896
Manual removal of retained placenta	164 (19.78)	82 (28.37)	0.0031
Shoulder dystocia	37 (2.51)	13 (2.83)	0.8344
PPH	232 (15.73)	98 (20.25)	0.0254
Severe PPH (blood loss greater than 1,500 mL)	18 (1.24)	9 (1.88)	0.4176
Need for an additional uterotonic agent	27 (3.26)	13 (4.5)	0.429
Second-line therapies†	4 (0.48)	2 (0.69)	0.999
Blood transfusion	20 (1.36)	16 (3.31)	0.010
Infection‡	19 (1.29)	8 (1.65)	0.7095
Thromboembolic event	3 (0.2)	1 (0.21)	0.999
Admission to ICU	2 (0.14)	0 (0)	0.999
Maternal death	0	0	-
Severe maternal morbidity§	115 (7.8)	48 (9.92)	0.1704
Neonatal outcome			
Birth weight 4,000 g or more	70 (4.75)	26 (5.37)	0.6677
5-min Apgar score less than 7	13 (0.88)	5 (1.04)	0.9788
pH less than 7.00	18 (1.24)	12 (2.53)	0.0803
Transfer to NICU	61 (4.14)	33 (6.83)	0.0226
NICU hospitalization longer than 24 h	58 (3.93)	32 (6.61)	0.0204
Respiratory distress syndrome	49 (3.32)	19 (3.93)	0.6267
Scalp laceration	66 (4.47)	42 (8.68)	< 0.001
Scalp hematoma	20 (1.36)	26 (5.37)	< 0.001
Neonatal trauma k	8 (0.54)	4 (0.83)	0.7193
<i>Fracture of the clavicle</i>	4 (0.27)	2 (0.41)	
<i>Fracture of a long bone</i>	1475 (100)	484 (100)	
<i>Brachial plexus injury</i>	4 (0.27)	2 (0.41)	
<i>Cephalhematoma</i>	5 (0.34)	2 (0.41)	
Need for resuscitation or intubation	8 (0.54)	1 (0.21)	0.5746
Sepsis	10 (0.68)	9 (1.86)	0.0421
Seizures	4 (0.27)	0 (0)	0.5707
Neonatal death	0	0	-
Severe neonatal morbidity	123 (8.34)	73 (15.08)	< 0.001

Variable \$	Severe maternal Morbidity (n=1959)				Severe Neonatal Morbidity (n=1959)			
	Crude OR (95% CI)	P	Adj. OR (95% CI)	P	Crude OR (95% CI)	P	Adj. OR (95% CI)	P
Maternal age /y	1.00 (0.97,1.03)	0.953	1.00 (0.96,1.03)	0.913	0.99 (0.96,1.02)	0.555	0.98 (0.95,1.01)	0.272
BMI before pregnancy BMI (kg/m ²) less than 25	1.00	-	1.00	-	1.00	-	1.00	-
BMI before pregnancy 25 to less than 30	1.06 (0.68,1.66)	0.796	0.99 (0.62,1.57)	0.951	1.27 (0.85,1.89)	0.251	1.26 (0.83,1.92)	0.275
BMI before pregnancy BMI 30 or higher	1.23 (0.68,2.25)	0.494	1.29 (0.70,2.41)	0.415	1.98 (1.21,3.23)	0.006**	1.80 (1.07,3.02)	0.027**
Parity Multiparity	1.00	-	1.00	-	1.00	-	1.00	-
Parity Nulliparity	0.96 (0.67,1.38)	0.818	1.65 (0.88,3.07)	0.116	1.01 (0.72,1.41)	0.969	1.16 (0.70,1.92)	0.558
History of caesarian section No	1.00	-	1.00	-	1.00	-	1.00	-
History of caesarian section Yes	1.90 (1.23,2.93)	0.004**	3.03 (1.51,6.07)	0.002**	0.97 (0.60,1.58)	0.900	1.09 (0.57,2.05)	0.801
History of adverse events during delivery μ No	1.00	-	1.00	-	1.00	-	1.00	-
History of adverse events during delivery μ Yes	0.84 (0.45,1.54)	0.564	0.96 (0.49,1.90)	0.911	1.57 (0.99,2.48)	0.055*	1.75 (1.01,3.02)	0.045**
History of preeclampsia, pregnancy induced hypertension or Intrauterine growth restriction No	1.00	-	1.00	-	1.00	-	1.00	-
History of preeclampsia, pregnancy induced hypertension or Intrauterine growth restriction Yes	1.18 (0.53,2.61)	0.690	1.33 (0.57,3.08)	0.513	1.45 (0.73,2.88)	0.286	1.07 (0.51,2.23)	0.862
Diabetes mellitus during pregnancy £ No	1.00	-	1.00	-	1.00	-	1.00	-
Diabetes mellitus during pregnancy £ Yes	0.51 (0.23,1.10)	0.086*	0.49 (0.22,1.10)	0.083*	1.22 (0.73,2.04)	0.451	1.02 (0.58,1.77)	0.954
Gestational weight gain more than 20 kg No	1.00	-	1.00	-	1.00	-	1.00	-
Gestational weight gain more than 20 kg Yes	1.58 (0.93,2.70)	0.092*	1.58 (0.91,2.74)	0.107	1.09 (0.62,1.90)	0.772	1.04 (0.58,1.85)	0.899
Prenatal suspicion of macrosomia† No	1.00	-	1.00	-	1.00	-	1.00	-
Prenatal suspicion of macrosomia† Yes	1.74 (1.00,3.01)	0.05**	1.70 (0.95,3.03)	0.073*	0.98 (0.53,1.81)	0.949	0.88 (0.46,1.68)	0.698
Gestational age (wk) Less than 39 wk	0.83 (0.53,1.30)	0.422	0.82 (0.52,1.30)	0.400	2.24 (1.58,3.18)	<0.001**	2.27 (1.58,3.26)	<0.001**
Gestational age (wk) 39 to less than 41	1.00	-	1.00	-	1.00	-	1.00	-
Gestational age (wk) Greater than 41	1.40 (0.97,2.02)	0.072*	1.45 (0.98,2.15)	0.061*	1.37 (0.95,1.99)	0.096*	1.25 (0.84,1.86)	0.276
Induced labor No	1.00	-	1.00	-	1.00	-	1.00	-
Induced labor Yes	1.04 (0.69,1.58)	0.837	0.89 (0.57,1.41)	0.626	1.58 (1.11,2.23)	0.011**	1.38 (0.93,2.04)	0.110
Active phase of second stage longer than 30 min No	1.00	-	1.00	-	1.00	-	1.00	-
Active phase of second stage longer than 30 min Yes	1.20 (0.77,1.86)	0.426	1.04 (0.65,1.68)	0.867	0.68 (0.42,1.10)	0.118	0.60 (0.36,1.01)	0.053*
Epidural analgesia No	1.00	-	1.00	-	1.00	-	1.00	-
Epidural analgesia Yes	0.67 (0.38,1.21)	0.184	0.36 (0.19,0.68)	0.002**	1.61 (0.77,3.35)	0.203	1.54 (0.72,3.32)	0.265
Persistent occiput position Anterior	1.00	-	1.00	-	1.00	-	1.00	-
Persistent occiput position Posterior	1.27 (0.75,2.12)	0.372	1.24 (0.72,2.11)	0.441	1.26 (0.78,2.04)	0.352	1.00 (0.60,1.66)	0.995
Persistent occiput position Transverse	0.90 (0.32,2.53)	0.841	0.92 (0.32,2.62)	0.869	1.88 (0.90,3.92)	0.091*	1.6 (0.75,3.42)	0.226
Indication for attempted operative vaginal delivery Nonreassuring FHR only	0.65 (0.45,0.93)	0.020**	0.66 (0.45,0.98)	0.039**	1.06 (0.75,1.50)	0.746	0.93 (0.64,1.36)	0.724
Indication for attempted operative vaginal delivery Arrested progress only	1.00	-	1.00	-	1.00	-	1.00	-
Indication for attempted operative vaginal delivery Nonreassuring FHR and arrested progress	0.85 (0.56,1.31)	0.472	0.90 (0.57,1.40)	0.633	1.6 (1.09,2.35)	0.017**	1.45 (0.96,2.17)	0.075*
College classification Mid	1.26 (0.85,1.88)	0.247	1.08 (0.70,1.66)	0.739	1.57 (1.10,2.24)	0.012**	1.29 (0.87,1.91)	0.198
College classification Low	1.00	-	1.00	-	1.00	-	1.00	-
College classification Outlet	0.82 (0.44,1.52)	0.528	1.07 (0.55,2.09)	0.838	0.97 (0.56,1.68)	0.921	1.08 (0.60,1.94)	0.801
Instrument type Vacuum	1.00	-	1.00	-	1.00	-	1.00	-
Instrument type Forceps	2.38 (1.19,4.78)	0.015**	2.52 (1.16,5.47)	0.019**	2.26 (1.26,4.04)	0.006**	1.45 (0.75,2.79)	0.271
Instrument type Spatula	1.87 (1.25,2.79)	0.002**	1.99 (1.25,3.15)	0.004**	1.11 (0.79,1.56)	0.546	0.90 (0.61,1.33)	0.594
Instrument type Sequential use of instruments	1.66 (0.67,4.10)	0.276	1.75 (0.69,4.45)	0.239	1.94 (0.96,3.91)	0.064*	1.60 (0.76,3.35)	0.218
Obstetrician performing delivery Senior attending obstetrician	1.00	-	1.00	-	1.00	-	1.00	-
Obstetrician performing delivery Obstetric registrar	0.77 (0.54,1.09)	0.144	0.94 (0.63,1.38)	0.739	0.51 (0.38,0.70)	<0.001**	0.57 (0.40,0.81)	0.002**

Variable §	Overall cohort (n=1959)			matched cohort (n=458)			
	Obstetric registrar	Senior attending obstetrician	Sd. difference, %	Obstetric registrar	Senior attending obstetrician	Sd. difference, %	
Maternal age > 30 y	No	1054 (71)	317 (65)	13	171 (75)	174 (76)	3
	Yes	421 (29)	167 (35)	13	58 (25)	55 (24)	3
BMI before pregnancy	BMI (kg/m ²) less than 25	1378 (93)	449 (93)	2.6	227 (99)	227 (99)	0
	BMI (kg/m ²) ≥ 25	97 (7)	35 (7)	2.6	2 (1)	2 (1)	0
Parity	Multiparity	376 (25)	126 (26)	1.2	33 (14)	33 (14)	0
	Nulliparity	1099 (75)	358 (74)	1.2	196 (86)	196 (86)	0
History of caesarian section	No	1324 (90)	430 (89)	3	214 (93)	214 (93)	0
	Yes	151 (10)	54 (11)	3	15 (7)	15 (7)	0
History of adverse events during delivery μ	No	1357 (92)	434 (90)	8.3	222 (97)	222 (97)	0
	Yes	118 (8)	50 (10)	8.3	7 (3)	7 (3)	0
History of preeclampsia, pregnancy induced hypertension or Intrauterine growth restriction	No	1423 (96)	463 (96)	4.3	228 (100)	228 (100)	0
	Yes	52 (4)	21 (4)	4.3	1 (0)	1 (0)	0
Diabetes mellitus during pregnancy £	No	1357 (92)	449 (93)	2.9	225 (98)	225 (98)	0
	Yes	118 (8)	35 (7)	2.9	4 (2)	4 (2)	0
Gestational weight gain more than 20 kg	No	1371 (93)	448 (93)	1.5	219 (96)	216 (94)	6
	Yes	104 (7)	36 (7)	1.5	10 (4)	13 (6)	6
Prenatal suspicion of macrosomia†	No	1384 (94)	453 (94)	1	225 (98)	225 (98)	0
	Yes	91 (6)	31 (6)	1	4 (2)	4 (2)	0
Gestational age (wk)	Less than 39 wk	306 (21)	99 (20)	0.7	43 (19)	43 (19)	0
	39 to less than 41	819 (56)	269 (56)	0.1	142 (62)	142 (62)	0
	Greater than 41	350 (24)	116 (24)	0.6	44 (19)	44 (19)	0
Induced labor	No	1218 (83)	392 (81)	4.1	212 (93)	212 (93)	0
	Yes	257 (17)	92 (19)	4.1	17 (7)	17 (7)	0
Active phase of second stage longer than 30 min	No	1278 (87)	409 (85)	6.2	209 (91)	206 (90)	4.5
	Yes	197 (13)	75 (15)	6.2	20 (9)	23 (10)	4.5
Epidural analgesia	No	89 (6)	32 (7)	2.4	8 (3)	8 (3)	0
	Yes	1386 (94)	452 (93)	2.4	221 (97)	221 (97)	0
Persistent occiput position	Anterior	1324 (90)	403 (83)	20.1	210 (92)	210 (92)	0
	Posterior	113 (8)	65 (13)	20.1	16 (7)	16 (7)	0
	Transverse	38 (3)	16 (3)	4.5	3 (1)	3 (1)	0
Indication for attempted operative vaginal delivery	Nonreassuring FHR only	613 (42)	221 (46)	8.3	111 (48)	111 (48)	0
	Arrested progress only	563 (38)	169 (35)	6.7	82 (36)	82 (36)	0
	Nonreassuring FHR and arrested progress	299 (20)	94 (19)	2.1	36 (16)	36 (16)	0
College classification	Mid	166 (11)	183 (38)	69.4	50 (22)	50 (22)	0
	Low	1152 (78)	280 (58)	45.7	174 (76)	174 (76)	0
	Outlet	157 (11)	21 (4)	21.9	5 (2)	5 (2)	0
Instrument type	Vacuum	548 (37)	68 (14)	49.8	36 (16)	36 (16)	0
	Forceps/spatula	881 (60)	392 (81)	44.6	188 (82)	188 (82)	0
	Sequential use of instruments	46 (3)	24 (5)	9.9	5 (2)	5 (2)	0