

KIELLAND'S FORCEPS. DOES IT INCREASE THE RISK OF OASIS?

Hypothesis / aims of study

There is no consensus about the place of Kielland's forceps in modern Obstetrics. Kielland's forceps is used to achieve rotation of the fetal head from occipitotransverse or occipitoposterior position at the midcavity level of the pelvis. The declining trend in the use of Kielland's forceps could be related to factors such as fear of maternal and fetal complications and subsequent litigation, lack of experience using Kielland's in modern Obstetric training (1) and increasing obstetrician's preference to use ventouse or resort to caesarean sections in the second stage.

We hypothesised that Kielland's rotational forceps delivery should not increase the severity of maternal perineal trauma. The rotation of the fetal head occurs at the midcavity level and therefore should not increase the risk of perineal trauma significantly over other types of forceps deliveries

The aim of this study was to investigate the association between the various degrees of maternal perineal trauma with the type of forceps delivery and in particular to investigate if Kielland's rotational forceps delivery increases the risk of Obstetric anal sphincter injuries (OASIS).

Study design, materials and methods

This was a retrospective observational study conducted in a tertiary maternity unit. Full demographic data of all consecutive forceps deliveries (1515) between March 2007 and October 2012 were obtained from the K2 maternity database. We included only deliveries with singleton live pregnancies, cephalic presentation and gestation above 36 weeks.

The primary outcome measure was to examine if rotational forceps was associated with increased risk of OASIS when compared to non rotational forceps. Secondary outcomes included the interactions between various factors namely age, BMI, ethnicity, birth weight which could potentially affect the rates of OASIS in our study cohort.

We used multinomial logistic regression models to estimate the crude and the adjusted relative risk analysis between the various parameters such as age, ethnicity, birth weight, type of instrumental delivery and operator's experience in relation to the types of perineal trauma. A univariate analysis explored the crude relative risk of third/fourth degree tears in relationship to all other variables. P-values less than 0.05 were considered as statistically significant.

Results

The original cohort consisted of 1525 women. The data was of very good quality and 1492 (98.5%) women had all data variables complete and the analysis is based on this fully observed data set. Table 1 shows the various demographics and results of forceps deliveries in our cohort.

We compared the relative risk ratio of the various types of direct traction forceps and failed ventouse deliveries with Kielland's forceps deliveries. There were no statistically significant differences between the risk of third/fourth degree tears among the various types of instrumental deliveries ($p=0.16$ for failed ventouse, $p=0.25$ for Wrigley's forceps and $p=0.60$ for Anderson's forceps delivery) when compared to Kielland's forceps deliveries.

Multinomial logistic regression analysis in our cohort has shown that Asian ethnicity (RR 1.65, CI-1.20, 2.27, $P=0.002$) and every 500 gram increase in birth weight (RR 1.21, CI 1.06, 1.39, $P=0.006$) have increased risk of OASIS provided other variables are held constant. The relative risk for OASIS in mixed race women increased almost twice every 5 unit increase in BMI by a factor of 1.75 which was statistically significant ($p=0.028$). There were no statistically significant differences in the relative risk ratios comparing the senior and junior registrars relative to the consultants for third/fourth degree tears, given the other variables in the model are held constant. ($p=0.18$ and $p=0.66$ respectively). We could not find a meaningful statistical interpretation of the interaction between the type of delivery, operator grade and OASIS.

Interpretation of results

Our study has demonstrated that rotational forceps does not increase the risk of OASIS when compared to non-rotational forceps deliveries. Although previous studies have shown that Kielland's forceps delivery has similar risks of OASIS when compared to other types of instrumental deliveries (2, 3), the role of confounding variables which can potentially increase the risk of OASIS has not been extensively reported in those studies. In our study Asian ethnicity, increasing birth weight and increase in BMI in mixed race women were found to be independently associated with increase in the risk of OASIS.

Concluding message

The results of our study show that rotational forceps delivery does not increase the risk of OASIS above non rotational forceps delivery. Prospective comparative studies are required to further evaluate the impact of the different types of instrumental deliveries on the pelvic floor including levator injuries and other sequelae on the pelvic floor anatomy and function

Table 1: Patient demographics

Demographics	Kielland's forceps delivery(n=108)	Failed ventouse and forceps delivery (n=494)	Direct traction forceps (n=890)	
			Wrigley's (n=90)	Anderson's (n=800)
Age (mean/SD)	31.11/ 5.309	31.17/ 5.085	31.15/ 5.596	30.94/ 5.032
BMI(mean/SD)	25.13/ 4.287	23.88/ 3.808	24.58/ 5.072	24.33/ 4.221

Smoking status	Smoking	1(1%)	10 (2%)	2 (2%)	32 (4%)
	Stopped at booking	18 (17%)	79 (16%)	18 (20%)	152 (19%)
	Non smoker	89 (82%)	405 (82%)	70 (78%)	616 (77%)
Ethnicity	Caucasian	71 (66%)	310 (63%)	67 (74%)	524 (65%)
	Asian	25 (23%)	106 (21%)	11 (12%)	156 (20%)
	Black	3 (3%)	25 (5%)	6 (7%)	42 (5%)
	Mixed	9 (8%)	53 (11%)	6 (7%)	78 (10%)
Parity	Primi	97 (90%)	451 (91%)	80 (89%)	724 (91%)
	Multi	11 (10%)	43 (9%)	10 (11%)	76 (9%)
Birth weight (mean-gram/SD)		3461/ 426.83	3508/ 466.27	3480/ 436.31	3443/ 498.24
Gestational age(mean/SD)		40.1/1.45	40.2/1.46	40.02/1.67	40.05/1.61
Analgesia	Non regional	95 (89%)	397 (80%)	76 (84%)	681 (85%)
	Regional	13 (11%)	97 (20%)	14 (16%)	119 (15%)
Grade of operator	Consultant	50 (47%)	48 (10%)	13 (14%)	87 (10%)
	Senior Registrar	22 (20%)	170 (34%)	34 (38%)	268 (34%)
	Junior registrar	36 (33%)	276 (56%)	43 (48%)	445 (56%)

References

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Disclosures

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