Vacuum assisted delivery: comparison between two groups (prolonged second stage of labour and non reassuring CTG)

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DOI: 10.36129/jog.2022.S87

Objective. The main purpose of assisted vaginal birth is to accelerate childbirth with minimal maternal and neonatal morbidity. The main indications for vacuum use are the non-reassuring cardiotocography and a prolonged second stage of labour.

Materials and Methods. We conducted a retrospective cohort study of pregnant women at term who delivered by vacuum (Kiwi OmniCup) from 2013 to 2019. Clinical data were collected from the 'assisted vaginal birth record' and analysed using chi-square test (significance: P-value < 0.05).

Results. The prevalence of assisted vaginal birth with vacuum from 2013 to 2019 was 7.3% (358/4900). The indications were: non reassuring CTG (224 cases: 62.6% - Group A) and prolonged second stage of labour (134 cases: 37.4% - Group B). As expected, epidural analgesia, neonatal weight > 4000 g and nulliparity were more frequent in patients with a prolonged second stage of labour.

In this group also the use of oxytocin, a normal CTG, three or more pulls, an application time ≥ 10 min. and blood loss ≥ 1000 ml were significantly more frequent.

Moreover, in group B there was a trend of Kristeller and episiotomy. There were 14 cases of 3rd and 4th degree perineal tears (3.9%), all with episiotomy with no differences between the groups.

There were also no differences regarding head station, the occiput posterior position, cup detachment and thick meconium.

Despite the importance of abdominal palpation in 1/5^{ths} it was performed only in 198 cases (55.3%).

In two cases, one per group, vacuum failed, with a subsequent caesarean.

An Apgar score < 7 at 5' was recorded in 5 infants, all in group A.

Operative Vaginal Delivery	Non reassuring fetal heart rate Group A	Prolonged second stage of labor Group B	Total	P Value	OR (CI 95% OR)
Cases N° (%)	224 (62,6)	134 (37,4)	358 (100)		
Nulliparous women (%)	164 (73,2)	118 (88,0)	282 (78,7)	0.001	*0,37 (0,20-0,67)*
Epidural analgesia (%)	38 (17,0)	37 (27,6)	75 (20,9)	0.01	*0,53 (0,32-0,89)*
Station of the head -1 (%)	11 (5,0)	4 (3,0)	15 (4,2)	0.37	*1,67 (0,52-5,38)*
Station of the head 0/+1 (%)	92 (41,0)	68 (50,7)	160 (44,7)	0.07	*0,67 (0,44-1,04)*
Station of the head +2/+3 (%)	121 (54,0)	62 (46,3)	183 (51,1)	0.15	*1,36 (0,88-2,09)*
Occiput posterior position (%)	57 (25,4)	43 (32,0)	100 (27,9)	0.17	*0,72 (0,45-1,15)*
Oxytocin infusion (%)	123 (54,9)	119 (88,8)	242 (67,6)	< 0.001	*0,15 (0,08-0,27)*
*CTG Normal (%)	6 (2,7)	93 (69,4)	99 (27,6)	< 0.001	*0,01 (0,005-0,03)*
*CTG Indeterminate (%)	81 (36,1)	37 (27,6)	118 (33,0)	0.09	*1,48 (0,93-2,36)*
*CTG Abnormal (%)	137 (61,2)	4 (3,0)	141 (39,4)	< 0.001	*51,1 (18,2-143,4)*
Meconium stained liquor (%)	65 (29,0)	27 (20,1)	92 (25,7)	0.06	*1.62 (0,97-2,70)*
Three or more pulls (%)	85 (37,9)	78 (58,2)	163 (45,5)	< 0.001	*0,43 (0,28-0,67)*
Application time ≥ 10 min. (%)	30 (13,4)	40 (29,8)	70 (19,5)	< 0.001	*0,36 (0,21-0,62)*
Cup detachment (%)	51 (22,7)	25 (18,6)	76 (21,2)	0.35	*1,28 (0,75-2,19)*
Kristeller manoeuvre (%)	41 (18,3)	36 (26,8)	77 (21,5)	0.05	*0,61 (0,36-1,01)*
Mediolateral episiotomy (%)	190 (84,8)	123 (91,8)	313 (87,4)	0.05	*0,50 (0,24-1,02)*
3th an 4th degree vaginal tears (%)	9 (4)	5 (3.7)	14 (3.9)	0.89	*1,08 (0,93-1,20)*
Birth weight > 4000 g. (%)	4 (1,7)	13 (9,7)	17 (4,7)	0.001	*0,16 (0,05-0,53)*
Blood loss ≥ 1000 ml (%)	5 (2,2)	12 (8,9)	17 (4,7)	0.004	*0,23 (0,08-0,67)*

*ACOG and National Institute of Child Health and Human Development

Conclusions. Our data show that we should expect different outcomes based on indications for assisted vaginal birth. Vacuum delivery performed by experienced operators result in safe outcomes for the mother and the baby. Abdominal palpation is scarcely used, the ultrasound assessment may be helpful for new operators.