Original Research Article

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Immediate Maternal and Neonatal Effects of Forceps and Vacuum - Assisted Deliveries

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Abstract

Introduction: In certain conditions when normal delivery cannot be allowed for various reasons, assisted vaginal delivery is the method of choice. Vaginal delivery being assisted by instruments can either be of vacuum extraction or forceps, a choice based on pelvic findings. The aim of the study was to observe the immediate maternal & neonatal effects of vacuum and forceps deliveries and to compare the effects of the same. *Materials & Methods:* This prospective study was done in a tertiary care centre from January to Aug 2017. 63 ventouse and 11 forceps deliveries were done. The indications, maternal and neonatal outcomes were observed. *Result:* 72.72% of forceps and 66.7% of ventouse deliveries were carried out in primigravida. Failure of secondary forces (Poor maternal bearing down efforts) was the indication in 60.31% of ventouse and 36.26% of forceps deliveries. Prolonged 2nd stage of labour was an indication in 20.63% of forceps and 27.27% of ventouse. Failure rate of ventouse was 9.52%, while forceps was 8.33% . Extension of an episiotomy (30.15%) was more in ventouse than forceps, while 3rd degree perineal tear were seen in (36.36%) cases, vaginal wall lacerations (72.7%) and traumatic PPH (27.27%) occurred more with forceps deliveries. Babies who had ventouse deliveries had higher Apgar score at one minute than those in whom forceps deliveries were done. *Conclusion:* Ventouse is the preferred instrument whenever the need arises for instrumental delivery. It causes much less maternal morbidity. However neonatal morbidity was insignificant in both the study groups.

Keywords: Instrument Delivery; Ventouse; Vaginal Delivery.

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Introduction

James Young Simson was the first to use traction to deliver a baby. It was later modified by Malmstrom in 1953. The obstetric forceps had its history from the time of Chamberlain family in the seventh century [1]. In certain conditions when normal delivery cannot be allowed for various reasons, assisted vaginal delivery is the method of choice. Vaginal delivery being assisted by instruments can either be of vacuum extraction or forceps, a choice based on obstetrician's competence and training. Vacuum extraction has recently gained in popularity because of new designs of vacuum cups, thereby minimizing injury to infants. However, a meta-analyses of randomized trials comparing maternal and infant outcomes between vacuum extraction and forceps deliveries have found that vacuum extraction causes less maternal trauma [2]. This study was done to observe the immediate maternal & neonatal effects of vacuum & forceps deliveries & to compare the effects of the same.

Materials & Methods

This was a prospective study done at a tertiary care centre in Mangalore from

January to August 2017 of 63 consecutive ventouse and 11 forceps deliveries. After obtaining ethical clearance, and consent the cases were scrutinised for demographic data, indication for instrumental delivery, maternal & neonatal complications. Exclusion criteria from both the groups were cases of multiple pregnancy, preterm (< 34 weeks of gestation) and breech presentation. The instruments used for vacuum extraction were silastic 40 mm and 60 mm cups. The negative pressure applied was up to 0.6 kg/cm. The forceps used was Wrigley's outlet forceps. During the procedure, the number of times the vacuum cup was applied, total number of pulls, number of times of detachment of the vacuum cup, application of vacuum cup to delivery time and any other difficulty in carrying out the procedure were noted. Neonatal outcomes of interest were birth weight, APGAR score, NICU admission, cephalhaematoma and scalp injuries. Maternal outcomes of interest were genital tract injuries (vaginal wall tear, cervical tear, and 3rd degree perineal tears), and postpartum hemorrhage.

For the purpose of analyses the cases were divided into two groups and statistically calculated by percentage method.

Results

Out of 69 attempted vacuum deliveries, 63 were successful. Failure rate of vacuum delivery was found to be 9.52%. Out of 12 attempted forceps, 11 were successful; hence the failure rate was calculated as 8.33%. The following tables depict the various parameters (Table 1-6). 72.72% of forceps and 66.7%

Table 1: Maternal Parity

	Vacuum (%) N = 63	Forceps (%) N = 11
Primigravida	42 (66.66%)	8 (72.72%)
Multigravida	21(33.33%)	3 (27.27%)

Table 2: Indications

	Vacuum (%) N = 63	Forceps (%) N = 11
Prolonged 2nd stage	13 (29.63)	3 (27.27)
Poor maternal efforts	38 (60.31)	4 (36.36)
Fetal distress	7 (11.11)	3 (27.27)
Prophylactic	5 (7.9)	1 (9)

Table 3: Maternal outcomes

	Vacuum (%) N = 63	Forceps (%) N = 11
3rd degree perineal tear	6 (9.52)	4 (36.36)
PPH	6 (9.52)	3 (27.27)
Cervical tear	5 (7.9)	3 (27.27)
Vaginal wall lacerations	18 (28.57)	8 (72.72)
Episiotomy extension	19 (30.15)	2 (18.18)

Table 4: Baby weight

	Vacuum (%) N = 63	Forceps (%) N =11
>3.5 kgs	4 (6.3)	None
3 – 3.5 kgs	55 (87.3)	9 (81.8)
<3 kgs	4 (6.3)	2 (18.18)

Table 5: APGAR Scores

	Vacuum (%) N = 63	Forceps (%) N = 11
8,9	57 (90.47)	9 (81.81)
7,8	4 (6.3)	1 (9.09)
<7,8	2 (3.1)	1 (9.09)
NICU stay	6 (9.52)	2 (18.18)

Table 6: Neonatal morbidity

	Vacuum (%) N = 63	Forceps (%) N = 11
Facial palsy	None	None
Brachial plexus injury	None	1 (9.09)
Cephalhaematoma	2 (3.1)	None
Scalp lacerations	None	None

of ventouse deliveries were carried out in primigravida.

Failure of secondary forces (Poor maternal bearing down efforts) was the indication in 60.31% of ventouse, 36.26% of forceps deliveries. Prolonged 2nd stage of labour was an indication in 20.63% of forceps and 27.27% of ventouse. Failure rate of ventouse was 9.52%, while forceps was 8.33%. Extension of an episiotomy in 30.15% was done more often in ventouse than forceps, while 3rd degree perineal tear was evident in 36.36%, vaginal wall lacerations 72.7%, traumatic post partum hemorrhage (PPH) 27.27% occurred more with forceps deliveries. Babies who had ventouse deliveries had a higher APGAR score at one minute than forceps deliveries Table 3.

Discussion

In this study, 72.72% of forceps and 66.7% of ventouse deliveries were carried out in primigravida, a finding similar to the reported rates in an earlier study by Akthar et al. [3].

When there is an indication for instrumental vaginal delivery, ventouse should be preferred over forceps, as it causes much less maternal morbidity and insignificant neonatal morbidities Failure of secondary forces (Poor maternal bearing down efforts) was the indication in 60.31% of ventouse, 36.26% of forceps deliveries. Prolonged 2nd stage of labour was an indication in 20.63% of forceps and 27.27% of ventouse. However, different studies by Giri and Mesleh et al report fetal distress as the commonest indications for vacuum assisted deliveries [4,5].

Proper use of vacuum extractor, appropriate negative pressure, and preventing cervical or vaginal tissues from entering the cup will further help in minimizing both maternal as well as neonatal morbidity. Extension of an episiotomy 30.15% was done more often in ventouse than forceps, while 3rd degree perineal tear 36.36%, vaginal wall lacerations 72.7%, traumatic PPH 27.27% occurred more with forceps deliveries.

A study by Achanna et al. [6] has reported a higher incidence of maternal trauma with forceps delivery compared to vaccum extraction [7,8]. Our study also reported lesser neonatal trauma with ventouse when compared to forceps deliveries. Meanwhile other studies have reported higher incidence of neonatal trauma with forceps deliveries [9,10,11].

Conclusion

The appropriate use of vacuum extractor, prevents cervical or vaginal tissues from entering the cup thus minimizing both maternal as well as neonatal morbidity.

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