



## A CLINICAL STUDY ON MATERNAL AND NEOATAL OUTCOME WITH INSTRUMENTAL DELIVERIES IN A TERTIARY CARE HOSPITAL

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### ABSTRACT

**METHOD:** This was a prospective observational study conducted at Gauhati Medical College and Hospital, Assam for a period of 1 year from June 2019 to May 2020. 300 women fulfilling the inclusion and exclusion criteria were taken. They were studied in terms of maternal age, parity, indications for the same, APGAR score, NICU admission, neonatal and maternal complications. **RESULTS:** The incidence of Instrumental Vaginal delivery was 13.9%. The mean age group in forceps delivery is 24.30±2.80 years and Vacuum delivery is 24.76±2.93 years. Majority of the women were Primigravida (75% in Forceps group Vs. 70 % in Vacuum group). All the women delivered at term gestation. Foetal distress was the most common indication of Instrumental assisted delivery (88% in Forceps group vs. 79% in Vacuum group). The mean birth weight in Forceps group was 2.7±0.36 Kg and Vacuum group was 2.69±0.32 Kg. In Forceps group 12% neonates sustained forceps marks, one neonatal death was also recorded and one case had cephalhaematoma in Vacuum group. Among maternal complications Episiotomy extension was more commonly seen in Forceps group (7%) and Para –urethral tear was commonly seen in Vacuum group(7%). **CONCLUSION:** Our study concludes that instrumental assisted delivery is safe but normal vaginal delivery is safer. Instrumental Vaginal delivery serves an important role in a tertiary care hospital where patients usually arrives late with associated co-morbidities and Caesarean section is not always an option. The choice of instruments used in each case needs to be individualized as one is not clearly safer than the other.

**KEYWORDS :** Instrumental Deliveries, Forceps, Vacuum

### INTRODUCTION

Spontaneous Vaginal delivery was and will always be the most natural and safest birth process benefitting both the mother and the baby in every possible way. Very few vaginal deliveries end up with complication which is mostly encountered in the second stage of labour, which is the most crucial stage of a normal vaginal delivery and may need assistance which is very often instrumental delivery.

Instrumental delivery can be associated with adverse maternal and neonatal outcome and demands an appropriate indication, proper training, skill and thorough knowledge. Therefore instrumental delivery is performed many a times only when the maternal or fetal interest outweighs the adverse outcome of the instrumental delivery.

The current rate of normal vaginal delivery receiving assisted instrumental delivery is only about 5-10% in various countries.<sup>1</sup> Low forceps and outlet forceps delivery is commonly practised. Currently vacuum assisted delivery is preferred over forceps assisted delivery considering the overall maternal and neonatal outcome.<sup>2</sup>

### METHODS

It was a prospective observational study conducted at Gauhati Medical College and Hospital, Assam from June 2019 to May 2020. 300 women fulfilling the inclusion and exclusion criteria were taken of which 100 women underwent forceps assisted delivery, 100 underwent vacuum assisted vaginal delivery and 100 women delivered by normal vaginal delivery.

The indications were mainly Foetal distress, prophylactic application and prolonged second stage labour and is shown in table no. 1.

After case selection, proper informed consent is taken and obstetrics examination is done. All the pre-requisites for the instrumental deliveries as laid down by the RCOG guideline is checked.

In our study we used Wrigley's Outlet Forceps for Forceps assisted deliveries. Soft Silastic vacuum cup was used to perform Vacuum assisted deliveries.

After conducting the delivery active management of third stage labour

was done and a compulsory per speculum was done and noted for primary PPH, episiotomy extension, vaginal, cervical and para-urethral laceration. Newborn was examined and APGAR score at 1 minute and 5 minute was noted. Other neonatal complications like Forceps mark, Cephalhaemaoma and NICU admissions were also observed. The patient is monitored for about 4 hours and is shifted to post natal ward. The mother and the baby is observed for 72 hours and if no complication occurs they are discharged on day 3.

### RESULTS

A total of 8,138 women underwent vaginal delivery from 1<sup>st</sup> June 2019 to 31<sup>st</sup> May 2020 out of which 593 (7.2%) women received Forceps assisted delivery and 542 (6.6%) women received Vacuum assisted delivery. The incidence of instrumental Vaginal delivery was 13.9%. We selected 100 women who delivered by Forceps delivery, 100 women who delivered by Vacuum assisted delivery and 100 women who delivered by normal vaginal delivery.

Age distribution is shown in the table no. 1. The age group of women in the study ranged from 19 years to 32 years. The mean age group in Forceps group is 24.30±2.80 years, in Vacuum group is 24.76±2.93 years and in Normal vaginal delivery group is 24.76±2.93 years. Majority of the women who underwent instrumental assisted deliveries were Primigravida. The most common indication for instrumental deliveries was Foetal distress, prophylactic application and prolonged second stage of labour. Prophylactic application was performed for previous caesarean cases and women with Eclampsia in second stage labour.

**Table No. 1 Maternal Characteristics**

Maternal characteristics	Forceps	Vacuum	Normal
Age (Mean ±SD)	24.30±2.80	24.76±2.93	25.35±2.66
Primigravida n(%)	75	70	41
Multigravida n(%)	25	30	59
Indications n(%)			
Foetal distress	88	79	
Prophylactic (post c/s and eclampsia)	8	15	
Prolonged labour	4	6	

**Table No. 2: Maternal Complications With Instrumental Deliveries**

Maternal complication	Forceps delivery n(%)	Vacuum delivery n(%)	Significance forceps vs vacuum
PPH	10(10)	4(4)	0.109 (P>0.05, NS)
Episiotomy extension	7(7)	1(1)	0.034 (P<0.05, S)
Vaginal Laceration	10(10)	5(5)	0.197(P>0.05, NS)
Cervical laceration	1(1)	2(2)	0.564(P>0.05, NS)
Para-urethral tear	4(4)	7(7)	0.366(P>0.05, NS)
Puerperal complication	1(1)	0	P>0.05, NS

**Table No. 3 Maternal Complications**

Maternal complication	Normal delivery n(%)	Instrumental deliveries n(%)	Significance Normal delivery Vs. Instrumental deliveries
PPH	2(2)	14(7)	0.0068 (P<0.05, S)
Episiotomy extension	0	8(4)	0.0430(P<0.05, S)
Vaginal Laceration	0	15(7.5)	0.005 (P<0.05, S)
Cervical laceration	0	3(1.5)	0.2191(P> 0.05, NS)
Paraurethral tear	1(1)	11(5.5)	0.0612 (P>0.05, NS)
Puerperal compli.	0	1(0.5)	0.4795 (P>0.05, NS)

**Table No. 4: Foetal Outcome**

Neonatal outcome	Normal delivery		Forceps delivery		Vacuum delivery	
	n	%	n	%	n	%
Cephalhaemato-ma	0	0	0	0	1	1
Forceps marks / abrasion	0	0	12	12	0	0
Nerve palsy	0	0	0	0	0	0
NICU admission	5	5	11	11	4	5
None	95	95	77	77	93	93
APGAR score <7 at 1 min.	10	10	15	15	14	14
APGAR score <7 in 5 min.	5	5	11	11	5	5
Birth weight (Mean± SD)	2.9±0.23		2.73±0.36		2.69±0.32	

Normal delivery group vs. Forceps assisted group P = 0.0003, Significant

Normal delivery group vs. Vacuum assisted group P = 0.364, Not significant

Forceps assisted group vs. Vacuum assisted group, P =0.0043, Significant

## DISCUSSIONS

Instrumental assisted vaginal delivery have a pivotal role in obstetric care in a tertiary care hospital. Forceps and Vacuum use has been a matter of concern owing to its advantages and disadvantages with maternal and Neonatal outcome. This study is undertaken to evaluate the maternal and neonatal outcome with instrumental assisted delivery in tertiary care hospital.

### Maternal age

In our study the age of the subject ranged from 19-32 years. Majority of the women were in the age group 25-30 years. The mean age group reported by S.Archanna et al was 25.6± 5.8 years for Forceps group and 24.3±4.7 years in Vacuum group.<sup>3</sup> Shekhar Sashank et al. also found similar mean age group with 24.4 ± 5.6 in Forceps group and 25.2±5.8 years in Vacuum group.<sup>4</sup> This findings are almost similar to our present study with mean age 24.3± 2.8 years in Forceps and 24.7± 2.9 years in Vacuum group.

### Parity

In our study we observed that 75% in Forceps group and 70% in Vacuum assisted group were Primigravida. Our findings were comparable with that of Carolyn Gardella et al in which 75% women in Forceps group and 68% women in Vacuum group were Primigravida.<sup>5</sup> Shekhar Sashank et al also found almost similar result with 78% in Forceps group and 64% in Vacuum group as Primigravida.<sup>4</sup> Archana Bhosale et al in their study also found 76.5% primigravida in forceps assisted delivery.<sup>6</sup>

### Indications

In the present study the most common indication for instrumental assisted delivery was Foetal distress in both Forceps group(88%) and Vacuum group (79%) followed by prophylactic application in Forceps group(8%) and vacuum group(15%). This was followed by prolonged 2<sup>nd</sup> stage of labour with 4% cases in forceps group and 6% in Vacuum

group. Shi Wu Wen et al in their study also reported the most common indication to be foetal distress (36.6% in forceps versus 30.2% in ventouse) though incidence is lower.<sup>7</sup> But S. Achanna et al reported prolonged 2<sup>nd</sup> stage of labour as the most common cause of instrumental assisted delivery(58% in Forceps and 66% in Vacuum ) only to be followed by Foetal distress.<sup>3</sup>

### Maternal complications

S. Archanna et al reported 1% episiotomy extension in Forceps group and none in Vacuum group which is lesser than our present study.<sup>3</sup> Vaginal tear was more commonly seen in Forceps group (4%) than Vacuum group(1%) which is almost comparable with our study but with lesser incidence( 10% in Forceps group Vs 5% in Vacuum group). In their study only 1% in Vacuum group had PPH and none in Forceps group but our study had higher incidence of PPH with 10% PPH in Forceps group and 4% in Vacuum group.

JH Johnson et al study showed higher incidences of episiotomy extension in Forceps group (44%) compared to Vacuum group (27.9%).<sup>8</sup> It is comparable to our study where we had 7% of women with episiotomy extension in Forceps group compared to Vacuum group and is statistically significant .Vaginal tear was also more commonly seen in Forceps group(19%) than in Vacuum group(9.7%) which is also almost similar to our present study where we had 10% cases in Forceps group and only 5 % in Vacuum group. Para-urethral tear was higher in Vacuum group(4.2%) compared to Forceps group which is also comparable to our present study with 7% cases in Vacuum group and 4% in Forceps group.

Shekhar Sashank et al. also found that Episiotomy extension was more common in Forceps group(4%) and none in Vacuum group.<sup>4</sup> This finding is almost similar to our present study with 7% cases in Forceps group and only 1 % case in Vacuum group which is also statistically significant.

We had one case of episiotomy wound gaping in Forceps group on day 6 puerperium managed later with secondary suturing.

### Foetal complications

In a study conducted by JH Johnson. et al they had higher incidence of NICU admission(19% in Forceps group and 24 % in Vacuum group ) compared to the present study with 11% NICU admission in Forceps group and 5% in Vacuum group . They also observed statistically significant higher incidence of Facial marks/forceps marks in Forceps group (36.5%) than Vacuum group(10.7%) in their study which is comparable to our study though with lower incidence( 12% in Forceps group Vs. none in Vacuum group) and is statistically significant.

A study by Prapas et al showed APGAR score less than 7 at 5 min in 4% cases in Forceps group and 3 % in Vacuum group which is slightly lesser than our present study( 11% in Forceps Vs. 5% in Vacuum group).<sup>9</sup> In our study it was seen that Forceps group had more NICU admission (11%) than Vacuum group(5%) which is comparable to their findings in which 38% cases in Forceps group and 11% in Vacuum group had NICU admission though the incidence is higher.

Aaron Caughey et al also reported 2.8% cases with APGAR score less than 7 at 5 minutes in Forceps group and 4.1 % in Vacuum group which is lesser than our present study.<sup>10</sup> Cephalhaematoma was reported to have higher incidence in Vacuum group than in Forceps group in the above study.<sup>8,10</sup> Our present study also showed 1 case of cephalhaematoma in Vacuum group and none in Forceps group. One neonatal death occurred in Forceps group where forceps was applied for Foetal distress. Baby was severely depressed at birth and expired at NICU for Hypoxic ischemic encephalopathy grade 3 on day 2.

### CONCLUSION

It is concluded that though instrumental deliveries had more number of maternal and neonatal complications, it was manageable and the overall prognosis is good. So in properly selected cases Forceps and Vacuum application are advocated as it also significantly reduces the number of caesarean sections and its complications.

Instrumental Vaginal deliveries serves an important role in a tertiary care hospital where patients usually arrives late with associated comorbidities and Caesarean section is not always an option. The choice of instruments used in each cases needs to be individualized as one is not clearly safer than the other.

**REFERENCES**

1. Dhodapkar, Sneha & Chauhan, Ramesh. (2015). Trend of Instrumental delivery at a tertiary care teaching hospital in South India. *Indian Journal of Applied Research*. 4. 513-515.
2. Nag U, Burra KC, Kodali M. Comparison of maternal and neonatal outcome between vacuum extraction and forceps deliveries.
3. Achanna S, Monga D. OUTCOME OF FORCEPS DELIVERY VERSUS VACUUM EXTRACTION–A REVIEW OF 200 CASES. *Singapore Med J*. 1994;35:605-8.
4. Shekhar S, Rana N, Jaswal RS. A prospective randomized study comparing maternal and fetal effects of forceps delivery and vacuum extraction. *The Journal of Obstetrics and Gynecology of India*. 2013 Apr;63(2):116-9.
5. Gardella C, Taylor M, Benedetti T, Hitti J, Critchlow C. The effect of sequential use of vacuum and forceps for assisted vaginal delivery on neonatal and maternal outcomes. *American journal of obstetrics and gynecology*. 2001 Oct 1;185(4):896-902.
6. Bhosale A, Nayak AH, Mehandale M, Doshi B. A prospective observational study to evaluate the maternal and neonatal outcome of forceps delivery in a tertiary care government hospital. *Age (years)*.:20(11):6-96.
7. Wen SW, Liu S, Kramer MS, Marcoux S, Ohlsson A, Sauvé R, Liston R. Comparison of maternal and infant outcomes between vacuum extraction and forceps deliveries. *American journal of epidemiology*. 2001 Jan 15;153(2):103-7.
8. Johnson JH, Figueroa R, Garry D, Elimian A, Maulik D, IPrapas N, Kalogiannidis I, Masoura S, Diamanti E, Makedos A, Drossou D, Makedos G. Operative vaginal delivery in singleton term pregnancies: short-term maternal and neonatal outcomes. *Hippokratia*. 2009 Jan;13(1):41.
9. Prapas N, Kalogiannidis I, Masoura S, Diamanti E, Makedos A, Drossou D, Makedos G. Operative vaginal delivery in singleton term pregnancies: short-term maternal and neonatal outcomes. *Hippokratia*. 2009 Jan;13(1):41.
10. Caughey AB, Sandberg PL, Zlatnik MG, Thiet MP, Parer JT, Laros RK. Forceps compared with vacuum: rates of neonatal and maternal morbidity. *Obstetrics & Gynecology*. 2005 Nov 1;106(5):908-12.