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Original Research Article

## Forceps deliveries and fetomaternal outcome in modern obstetrics

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### ABSTRACT

**Background:** In modern obstetrics practice has witnessed an increase in the caesarean section rates everywhere. The incidence of instrumental deliveries varies between 10-12% in UK. The incidence of instrumental deliveries varies between 2.7-5% in India. There is an urgent need to reintroduce instrumental need in the modern obstetrics. Instrumental delivery is one of the basic functions of emergency care according to WHO. This study was done to know the prevalence, indications and fetal outcomes of forceps deliveries.

**Methods:** A retrospective study was conducted at a tertiary teaching hospital, India from January 2014 to December 2018. All cephalic singleton pregnant mothers who underwent forceps delivery after 28 weeks were included. All the forceps delivery done in twins and breech vaginal delivery were excluded. Demographic data, Indication of forceps delivery, maternal complications of forceps delivery like episiotomy extension, cervical tear, vaginal wall tear, PPH and neonatal outcome like low birth weight, NICU admissions, stillbirth, APGAR score at 1 and 5 minutes were recorded. Equal number of mothers of reproductive age group 20-45 ages who underwent normal non breech vaginal deliveries were randomly selected as control.

**Results:** The prevalence of forceps delivery was 5.25%. The most common indication was fetal distress (55%). Most of the mothers were primigravidas in age group 20-30 years ( $p < 0.001$ ). Regarding the neonatal outcome, 72% of the babies were having weight  $> 2.5$  kgs. APGAR  $< 7$  at 1 and 5 min was not significant.

**Conclusions:** As fetal distress is the most common indication, every obstetrician should learn the skill of forceps delivery and it should not be a dying art.

**Keywords:** Forceps, Low birth weight, Postpartum haemorrhage

### INTRODUCTION

Instrumental deliveries are vaginal deliveries accomplished with the use of vacuum device or forceps. Instrumental deliveries are an important part of obstetric practice which enables the obstetrician to deliver vaginally and thereby reducing the caesarean rates. Modern obstetric practice has witnessed an increase in the caesarean section rates everywhere. There are ways of preventing primary caesarean delivery and forceps delivery is one of them. ACOG and the Society for

maternal fetal medicine address the concept of preventing the primary caesarean delivery.<sup>1</sup>

The incidence of instrumental deliveries differs among different locations and obstetricians too. The incidence varies between 10-12% in UK and 10-15% in US.<sup>2,3</sup> The incidence of instrumental deliveries varies between 2.7-5% in India.<sup>4,5</sup> There is an urgent need to reintroduce instrumental need in modern obstetrics. Instrumental delivery is one of the basic functions of emergency care according to WHO.<sup>6</sup> So, facilities should be made

available and easily accessible not only in labour wards and operation theatres but also in ambulances and casualty wards.

The aim of the present study was to assess the prevalence of forceps deliveries and its fetomaternal outcome among all the births occurring at Medicity Institute of Medical Sciences (MIMS), a rural tertiary teaching hospital in Telangana in a period of 5 years from January 2014 to December 2018.

## METHODS

This is a retrospective study conducted at Medicity Institute of Medical Sciences, a rural tertiary teaching hospital located 35 km from the city of Hyderabad in Telangana state, India. All forceps deliveries delivered after 28 weeks of gestation at MIMS in during a period of 5 years from January 2014 to December 2018 were included.

All deliveries in the hospital and pregnancy outcomes are recorded in the birth register. The hospital records of all patients who had forceps deliveries were obtained.

### Inclusion criteria

- Singleton pregnancy
- Cephalic presentation
- Forceps delivery.

### Exclusion criteria

- Twin deliveries
- Breech deliveries.

Using each woman's unique medical record number, case files were obtained and data on demographic variables, indication of forceps delivery, maternal complication of forceps delivery like episiotomy extension, cervical tear, vaginal wall tear, PPH and neonatal outcome like early neonatal death, NICU admissions, stillbirth, APGAR score at 1 and 5 minutes were recorded for all the cephalic singleton forceps deliveries.

Gestational age was calculated using last menstrual period and confirmed by dating scan. Forceps deliveries were performed using short curved outlet Wrigley's forceps. Criteria for application of outlet forceps were scalp visible at the introitus without separating labia, fetal skull has reached pelvic floor, Sagittal suture in anteroposterior diameter or right or left occiput anterior or posterior position. Fetal head at or on perineum. Rotation does not exceed 45 degrees.<sup>7</sup>

Equal number of mothers of reproductive age group 20-45 ages who underwent normal non breech vaginal deliveries were randomly selected as controls. The

indications of instrumental vaginal delivery were broadly based on 4 common indications.<sup>8</sup>

- Prolonged second stage of labour (Defined as- In Nulliparous as lack of progress of labour for 3 hours with regional anesthesia or 2 hours without anesthesia. In multiparous as lack of progress of labour for 2 hours with regional anesthesia or 1 hours without anesthesia)
- Non reassuring fetal testing (suspicion of immediate or potential fetal compromise is an indication for the operative vaginal delivery)
- Elective shortening of second stage of labour (In maternal cardiovascular /neurological disorders)
- Maternal exhaustion (largely subjective and not well defined).

### Statistical analysis

Data was collected and tabulated as shown in results. Statistical analysis was done using Microsoft Excel. Each parameter's frequency and percentage were calculated and analyzed.

## RESULTS

A total of 513 forceps deliveries out of 9765 deliveries occurred at Medicate Institute of Medical Science from January 2014 to December 2018. The prevalence rate is 5.25% (Table 1).

**Table 1: Year wise prevalence of forceps delivery from January 2014 to December 2018.**

Year	Forceps	Normal vaginal	Prevalence
2014	87	2600	3.4%
2015	88	1855	4.6%
2016	133	2073	6.4%
2017	104	1847	5.7%
2018	101	1390	7.2%
<b>Total</b>	<b>513</b>	<b>9765</b>	<b>5.25%</b>

**Table 2: Age distribution of woman who delivered by forceps.**

Age in years	Forceps	Normal vaginal
< 19	60 (12%)	28 (5%)
20-25	323 (63%)	344 (67%)
26-30	107 (20%)	118 (23%)
31-35	23 (4%)	19 (3.7%)
36-40	0	3 (0.5%)
41-45	0	1 (0.1%)

Majority of mothers (83%) who required forceps for delivery were between 20-30 years. Ninety-three percent were booked cases. Only 27% were multigravida (Table 2, 3, 4).

Fetal distress (55%) was the most common indication for which forceps was applied, followed by cutting short second stage of labor (Table 5). Maternal complications were seen in 17.5% of cases. The most common complication seen was PPH (5.8%) (Table 6).

**Table 3: Booking status of woman who delivered by forceps.**

Booking status	Forceps	Normal vaginal	OR	P-value
Un booked	37 (7%)	30 (6%)	1.251	0.3772
Booked	476 (93%)	483 (94%)		

**Table 4: Parity status of woman who delivered by forceps.**

Parity	Forceps	Normal vaginal	OR	P. value
Primi	375 (73%)	222 (43%)	3.53	< 0.0001
Multi	139 (27%)	291 (57%)		

**Table 5: Indication for forceps application.**

Indication	Forceps
Fetal distress	283 (55%)
Poor maternal efforts	106 (21%)
To shorten 2 <sup>nd</sup> stage	124 (24%)

**Table 6: Maternal complications/morbidities.**

Morbidity conditions	Number	Percentage
Postpartum hemorrhage	30	5.8%
Vaginal and cervical lacerations	25	4.8%
Third and fourth degree perineal tear	20	3.8%
Paraurethral tear	8	1.5%
Vulvo vaginal hematoma	7	1.3%

**Table 7: Fetal outcome of woman who delivered by forceps.**

Fetal outcome	Forceps	Normal vaginal
IUD	3 (0.5%)	2 (0.3%)
Mother side	252 (49%)	314 (61.2%)
NICU	257 (50.5%)	197 (38.4%)

**Table 8: Birth weight of the forceps delivered babies.**

Baby weight in kg	Forceps	Normal vaginal	OR	P value
< 2.5	142 (28%)	85 (17%)	1.92	< 0.0001
> 2.5	371 (72%)	428 (83%)		

NICU admission was noted in 50.5% of the cases. Birth weight < 2.5 kgs were noted in only 28% of the cases.

Low Apgar score <7 in one and five minutes were noted in only 15% and 2.3% respectively (Table 7, 8 and 9).

**Table 9: APGAR Score of the forceps delivered babies**

Apgar score	Forceps	Normal vaginal	OR	P. Value
1' < 7	75 (15%)	30 (6%)	0.2	0.14
5' < 7	12 (2.3%)	1 (0.1%)		

## DISCUSSION

In the present study, the prevalence was 5.25% which is higher than that of other studies, Prameela RC et al (2.2%), Lamba A et al (4.2%).<sup>4,5</sup> But the prevalence rate in the current study is very much lower than 8.5% recommended by RCOG and also lower than developed countries.<sup>8</sup> The low prevalence in the current study may be due to the reluctance among the obstetrician to use forceps for the fear of litigation following the poor maternal and fetal outcome after forceps. Another reason for low prevalence is due to low use in low resource setting universally as seen in study done by Ameh CA et al.<sup>9</sup>

Most of the mothers who had forceps delivery, 430 (83%) belong to age group 20-30 years which is same in other studies Lamba A et al (40%), Shameel F et al (87%), Aliyu LD et al (62%) and Demissie K. Rhoads GG et al.<sup>5,10,12</sup> The reason of more forceps delivery in age group of 20-30 years of age may be due to the early marriage of women resulting in their first pregnancy in their twenties.

Most Mothers were primigravida 375 (73%) and it is similar to other studies Lamba A et al (68%), Shameel F et al (57%), Aliyu LD et al (52%), Aktar S et al.<sup>5,10,11,13</sup> The prevalence of more forceps delivery in primigravida may be because of rigid perineum, minor degree of relative cephalo pelvic disproportion.<sup>14</sup>

Regarding the maternal outcome, the maternal injuries were noted in 17.5% of the cases and it was higher than study done by John LB et al except vulvovaginal hematoma (1.3 %) in the current study while it is 2.8% (Lamba A et al).<sup>15</sup> PPH was most common complication noted in the present study.

Fetal distress 283 (55%) was the most common indication and is similar to the study done by Lamba A et al (54%), Nikolov A et al (78.1%) and Yeomans ER et al but is in contrary to the study done by Shameel F et al where Fetal distress accounted for only 11% cases and 70% were due to prolonged second stage.<sup>5,16,17</sup> 50.5% of the babies had NICU admission which is much higher than the study done by Shameel F et al (27%), Prapas N et al (14.43%).<sup>8,18</sup> The higher number of NICU admission again may have been contributed by combine fear of the paediatricians and the obstetrician for litigation rather than pure indication as only 15% and 2.3% of the forceps

delivery had low Apgar score of < 7 in 1 mins and 5 mins respectively.

Regarding the neonatal outcome, only 28% of the babies were having weight < 2.5 kgs showing that instrumental deliveries were more frequent in infants with higher birth weight and this finding is similar to study done by Lamba A et al and Wu Wen S et al.<sup>5,19</sup>

## CONCLUSION

Decision to proceed with a forceps delivery when a spontaneous vaginal delivery is not possible must be based not only upon maternal and fetal risks but also on the expertise of attending obstetrician. As fetal distress is the most common indication, every obstetrician should learn the skill of forceps delivery and it should not be a dying art.

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