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ORIGINAL RESEARCH

Fetomaternal outcomes of Forceps versus Ventouse delivery: A Three years retrospective study in a tertiary care hospital in Eastern India

Dr. Abantika Ghosh[1], Dr. Arpan Kumar Ghosh[2], Dr. Jyotirmay Biswas[3], Dr. Alaap Chowdhury[4]

[1]Senior Resident, Department of Obstetrics and Gynecology, Medical College and Hospital, Kolkata, West Bengal, India
[2]Assistant Professor, [3]Demonstrator, Department of Physiology, College of Medicine and JNM Hospital, WBUHS, Kalyani, Nadia, West Bengal, India
[4]Internee Doctor, Department of Obstetrics and Gynecology, R.G. Kar Medical College and Hospital, Kolkata, West Bengal, India

Corresponding author
Dr. Abantika Ghosh
Senior Resident, Department of Obstetrics and Gynecology, Medical College and Hospital, Kolkata, West Bengal, India
Email: Abantika.ghosh2000@gmail.com

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ABSTRACT

Background: Vaginal deliveries accomplished with the use of forceps or vacuum device (ventouse) are termed as operative vaginal deliveries. **Materials and methods:** A unicentric, retrospective study was conducted in the department of Obstetrics and Gynecology of R.G Kar Medical College, Kolkata, West Bengal, India to compare the maternal and fetal effects of forceps vs ventouse delivery over a period of three years (2020 to 2022). Log book records collected over the said period of time was analyzed using Spss software. Comparison was done using Chi square (χ^2)test. P value< 0.05 was considered statistically significant. **Results:** Third and fourth degree perineal tears and traumatic PPH were more with forceps delivery in all three years ($P < 0.05$). The highest rate of failure was seen with ventouse application in 2020 (4.61%). In our study, ventouse delivery was associated with lesser maternal trauma but was accompanied by increased fetal complications like cephalhematoma and severe jaundice. **Conclusion:** Instrumental delivery when performed by skilled operators and after correct judgement, can be very useful to reduce unnecessary Caesaren section rates. Training of residents is therefore mandatory for obtaining optimum and efficient use of either instrument with minimal maternal and fetal complications.

Keywords: Instrumental delivery, Retrospective study, Fetomaternal outcomes

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INTRODUCTION

Vaginal deliveries accomplished with the use of forceps or vacuum device (ventouse) are termed as operative vaginal deliveries. Either of the device when applied to the fetal head , generates traction forces to augment maternal pushing to deliver the fetus vaginally. (1)

Termination of second stage of labour by these instruments may be necessary for fetal indications (viz. non reassuring fetal heart rate pattern) or maternal indications (heart disease , pulmonary compromise, intrapartum infection, maternal exhaustion).

MATERIALS AND METHODS

A unicentric, retrospective study was conducted in the department of Obstetrics and Gynecology of R.G Kar Medical College, Kolkata, West Bengal to compare the maternal and fetal effects of forceps vs ventouse delivery over a period of three years (2020 to 2022). Log book records collected over the said period of time was analyzed using Spss software. Maternal complications like third and fourth degree perineal tear, maternal genital hematoma, traumatic PPH, ICU/ HDU admission , failed procedure requiring Caesarean section and maternal death were analyzed. Fetal complications that were considered

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were minor scalp injury, scalp laceration, cephalhematoma, severe jaundice, brachial palsy, facial nerve palsy, NICU admissions and neonatal death. Comparison was done using Chi square (χ^2)test. P value< 0.05 was considered statistically significant.

RESULTS

In 2020, there were total 418 forceps (7.42% of total vaginal deliveries) and 65 ventouse deliveries (1.15% of total vaginal deliveries). Third and fourth degree perineal tears were more in the forceps group (8.37%, P <0.0001). Forceps delivery resulted in a greater number of traumatic PPH (10.28% , P< 0.0001). Amongst the neonates born , minor scalp injury was more with forceps use (4.30%, P = 0.0003). NICU admission was more in the ventouse group (12.07%) as compared to forceps group (6.45% , P =0.001).

In 2021, there were total 313 forceps (5.95% of total vaginal deliveries) and 87 ventouse deliveries (1.65% of total vaginal deliveries). Third and fourth degree perineal tears were more in the forceps group (25%, P <0.0001). Forceps delivery resulted in a greater number of traumatic PPH (38% , P< 0.0001). There were a greater number of failed procedure with forceps (8%) compared with ventouse (5.44%, P= 0.01). Amongst the neonates born , minor scalp injury was more with ventouse (4.59%) than with forceps use (4.15% , P = 0.02).

In 2022, there were total 349 forceps (6.62% of total vaginal deliveries) and 32 ventouse deliveries (0.60% of total vaginal deliveries). Third and fourth degree perineal tears were more in the forceps group (13.18%, P <0.0001). Forceps delivery resulted in a greater number of traumatic PPH (18.91% , P< 0.0001). There were a greater number of failed procedure with ventouse (3.12%) compared with forceps (2.86%, P= 0.006). Amongst the neonates born , minor scalp injury was more with forceps use (11.17%, P =< 0.0001). NICU admission was more in the ventouse group (28.12%) as compared to forceps group (9.45% , P =0.002).

Table 1: Frequency of instrumental delivery over a period of three years

Year	Vaginal Delivery	Forceps	Percentage(%)	Ventouse	Percentage(%)
2020	5631	418	7.42	65	1.15
2021	5260	313	5.95	87	1.65
2022	5271	349	6.62	32	0.60
Total	16162	1080	6.68	184	1.13

Table 2: Maternal complications with forceps vs ventouse delivery over a period of three years

YEAR	MATERNAL COMPLICATION	AFTER FORCEPS DELIVERY	PERCENTAGE(%)	AFTER VENTOUSE DELIVERY	PERCENTAGE (%)	CHI SQUARED (χ^2)	P VALUE
2020 (total forceps = 418, Ventouse = 65)	Third or Fouth degree perineal tears	35	8.37	2	3.07	29.43	< 0.0001(*)
	Maternal genital hematoma	12	2.87	5	7.69	2.88	0.08
	Traumatic PPH requiring transfusion	43	10.28	5	7.69	30.08	<0.0001 (*)
	Maternal HDU/ICU admission	5	1.19	1	1.53	2.66	0.1
	Failed procedure requiring Caesarean section	6	1.43	3	4.61	1.00	0.3
	Maternal death	2	0.47	0	0	-	-
2021 (total	Third or Fouth degree perineal tears	25	7.98	2	2.29	19.59	<0.0001 (*)
	Maternal	5	1.59	3	3.44	0.5	0.4

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forceps = 313, Ventouse = 87)	genital hematoma						
	Traumatic PPH requiring transfusion	38	12.14	4	4.59	27.52	<0.0001 (*)
2021	Maternal HDU/ICU admission	3	0.95	2	2.29	0.2	0.6
	Failed procedure requiring Caesarean section	8	2.55	1	1.14	5.44	0.01 (*)
	Maternal death	4	1.27	1	1.14	1.80	0.1
2022 (total forceps = 349, Ventouse = 32)	Third or Fouth degree perineal tears	46	13.18	1	3.125	43.08	<0.0001 (*)
	Maternal genital hematoma	12	3.43	0	0	-	-
	Traumatic PPH requiring transfusion	66	18.91	2	6.25	60.23	<0.0001 (*)
	Maternal HDU/ICU admission	8	2.29	0	0	-	-
	Failed procedure requiring Caesarean section	10	2.86	1	3.125	7.36	0.006(*)
	Maternal death	0	0	0	0	-	-

(Statistically significant results are marked with *)

Table 3: Fetal complications with forceps vs ventouse delivery over a period of three years

YEAR	FETAL COMPLICATION	AFTER FORCEPS DELIVERY	PERCENTAGE (%)	AFTER VENTOUSE DELIVERY	PERCENTAGE (%)	CHI SQUARED (χ^2)	P VALUE
2020 (total forceps = 418, Ventouse = 65)	Minor scalp injury	18	4.30	2	3.07	12.8	0.0003(*)
	Scalp laceration requrinig suturing	12	2.87	0	0	-	-
	Cephalhematoma	3	0.71	4	6.15	0.14	0.70
	Severe jaundice	2	0.47	3	4.61	0.20	0.65
	Brachial palsy	1	0.23	0	0	-	-
	Facial nerve palsy	0	0	0	0	-	-
	NICU admission	27	6.45	8	12.07	10.31	0.001(*)
	Neonatal death	2	0.47	0	0	-	-
2021 (total forceps = 313, Ventou	Minor scalp injury	13	4.15	4	4.59	4.76	0.02(*)
	Scalp laceration requrinig suturing	4	1.27	1	1.14	1.80	0.17

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se = 87)	Cephalhematoma	3	0.95	7	8.04	1.60	0.20
	Severe jaundice	1	0.31	1	1.14	-	-
	Brachial palsy	1	0.31	0	0	-	-
	Facial nerve palsy	0	0	0	0	-	-
	NICU admission	14	4.47	6	6.89	3.20	0.07
	Neonatal death	0	0	0	0	-	-
2022 (total forceps = 349, Ventouse = 32)	Minor scalp injury	39	11.17	2	6.25	33.39	<0.0001(*)
	Scalp laceration requrinig suturing	3	0.85	0	0	-	-
	Cephalhematoma	4	1.14	11	34.37	3.26	0.07
	Severe jaundice	10	2.86	12	37.5	0.18	0.66
	Brachial palsy	0	0	0	0	-	-
	Facial nerve palsy	1	0.28	0	0	-	-
	NICU admission	33	9.45	9	28.12	13.71	0.0002(*)
	Neonatal death	2	0.57	0	0	-	-

(Statistically significant results are marked with*)

DISCUSSION

Forceps and ventouse delivery are not substitutes for Caesarean section, however, they are safer alternatives in many cases if applied using appropriate protocols.

In our study institute, use of forceps was more frequent (N= 1080) than the use of ventouse (N'= 184) over the study period. Instrumental delivery was used to expedite the birth either for maternal or fetal indications. Forceps use was associated with a greater number of maternal complications like third and fourth degree perineal tear and traumatic PPH. The results obtained in our study was similar to the study by Shi Wu Wen [(2)]and Archanna[(4)]. Failed instrumental delivery is quite common. In our study, the highest rate of failure was seen with ventouse application in 2020 (4.61%). RCOG guidelinesstate that sequential use of instruments should be avoided wherever possible and should not be attempted by inexperienced operators[(5,6)]. Also, SOGC guidelines suggest that failure of chosen method within a reasonable time should call for abandonment of the method.[(7)] In our study, failure to deliver by one instrument was followed by Caesarean section. In our study, ventouse delivery was associated with lesser maternal trauma but was accompanied by increased fetal complications like cephalhematoma and severe jaundice. The results were similar to the studies of Johnson RB [(8)] and D Monga [(4)] .

CONCLUSION

Our study compared the maternal and fetal outcomes with forceps vs ventouse deliveries retrospectively over a period of three years. Overall, maternal genital injury was more with forceps delivery while fetal complications like cephalhematoma and NICU admission was more with ventouse delivery. Instrumental delivery when performed by skilled operators and after correct judgement, can be very useful to reduce unnecessary Caesaren section rates. Training of residents is therefore mandatory for obtaining optimum use of either instrument with minimal maternal and fetal complications.

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