

Outcome of forceps delivery in a teaching hospital: A 2 year experience

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Abstract

Introduction: The art of forceps delivery though existing for centuries has earned a disreputation due to the possibility of poor maternal and fetal outcome. However, its safe use can reduce the rising cesarean section rates in the present times. This study is to see the outcome of its use in a teaching hospital over a 2 year period. **Materials and Methods:** In this retrospective observational study, 120 cases of forceps delivery were studied for maternal outcome such as injuries, postpartum hemorrhage, and fetal outcome such as Apgar score at birth, neonatal intensive care unit admissions, injury, and mortality. **Results:** The most common indication was fetal distress (47.5%). A total of 15 cases (12.5%) of maternal injuries occurred, with 2 uterine ruptures one of which was in a previous lower segment caesarean section case, 4 complete perineal tears and 9 minor cervical and vaginal lacerations. A total of 12 babies (10%) had poor Apgar scores who recovered after resuscitation and one out of them died, which was a case of multiple instrumentation. **Conclusion:** Forceps is a reasonable option for the obstetrician to reduce the caesarean section rates; however, extreme caution, proper expertise and judicial use of this instrument are required to prevent undue risk to mother and fetus.

Key words: Fetal outcome, forceps, injuries, maternal outcome

INTRODUCTION

Forceps has been an integral part of obstetrician's armamentarium. Since, its introduction by Chamberlain family centuries ago, this has undergone numerous modifications and has evolved into its present form. This art of instrumental delivery, though has benefited many, it has also led to numerous litigations due to poor fetal and sometimes maternal outcome leading to reluctance in its use. In this present day, when there is a universal concern regarding the alarming rise of caesarean section rates, a better understanding of this instrument will help the patient as well as the obstetrician. This study is to evaluate the outcome of its use in a teaching institution over a 2-year period.

MATERIALS AND METHODS

This is a retrospective observational study. Over a 2-year period, all cases of forceps deliveries were included, a total of 120, all which were singleton fetus in cephalic presentation. The choice of instrument and the indications were noted. The parameters studied were maternal outcome such as injuries and postpartum hemorrhage (PPH), and fetal such as Apgar scores at birth, neonatal intensive care unit (NICU) admission, injuries, and mortality.

RESULTS

A total of 120 cases were studied and the mean age of the patients was 24 years. The number of primigravida were 79 (65.8%) and 41 were multigravida. Low and outlet forceps were applied in 67 and 53 cases respectively. The most common indication for application was fetal distress (47.5%) followed by poor maternal efforts (30%). The indications are given in Table 1.

Access this article online	
Quick Response Code:	Website: www.jnsbm.org
	DOI: 10.4103/0976-9668.127316

A total of 15 cases (12.5%) of maternal injuries were noted with 2 cases of uterine rupture, 4 complete perineal tears and 9 minor cervical and vaginal lacerations. Furthermore, PPH occurred in 5 (4.2%) cases, three being atonic and 2 traumatic associated with rupture uterus. Maternal injuries are given in Table 2.

A total of 4 cases of complete perineal tears (where the tear involves the external anal sphincter) were there. 3 resulted from outlet forceps applied in primigravida and 2 babies among these were large for gestational age. The case profile in complete perineal tears is given in Table 3.

There were 2 cases of uterine rupture. The first was a second gravida, previous normal delivery, low forceps applied for fetal distress and a 2.5 kg baby delivered. Uncontrolled PPH prompted laparotomy, posterior wall tear was detected. The second case was a second gravida with previous lower segment cesarean section (LSCS) where outlet forceps was applied for fetal distress and a 2.7 kg baby delivered. The patient had PPH, scar rupture was diagnosed. The baby weights are given in Table 4.

Regarding the neonatal outcome, 12 babies (10%) had low

Table 1: Indications of forceps application

Indication	Number
Fetal distress	57
Poor maternal efforts	36
Cut short 2 nd stage	15
Prolonged 2 nd stage	12

Table 2: Maternal injuries

Injury	No.	%
Complete perineal tear	4	3.3
Lacerations of cervix/vagina	9	7.5
Uterine rupture	2	1.6

Table 3: Case profiles of complete perineal tear

Parity	Instrument	Indication	Baby wt.(kg)
Primi	Outlet	Cut short 2 nd stage	3.6
Primi	Outlet	Fetal distress	2
Primi	Outlet	Poor maternal efforts	2.7
Multi	Low	Cut short 2 nd stage	3.3

Table 4: Baby weights

Baby wt.	No.
SGA	34
AGA	59
LGA	27
>3.5 kg	18

SGA: Small for gestational age; AGA: Appropriate for gestational age; LGA: Large for gestational age

Apgar and required NICU admission out of which one baby died, which was a case of multiple instrumentations. In all but one fetal distress was the indication. Meconium stained liquor was present in 6 cases. Cases with 1 and 5 min Apgar scores of less than 4 and 7 were 12 (10%) and 11 (9.1%) respectively.

DISCUSSION

The most frequent indication for forceps application in a Bulgarian study was fetal distress (78.1%), which is the most common indication in modern obstetrics for the past 15 years, similar results were found in the present study (46.3%). However, the next most frequent indication in the aforementioned study was prolonged 2nd stage (23.6%) (i.e., where delivery is delayed for more than 2 h in primigravida and 1 h in multigravida after full dilatation of the cervix), whereas it was poor maternal efforts (30%) in this study.^[1] In another study in Cameroon, the most common indication was prolonged 2nd stage of labor.^[2] In a study in Texas University the most common indication was fetal distress followed by poor maternal efforts, which agrees with our present study.^[3] In another Indian study, cutting short of 2nd stage of labor (i.e., where prolonged bearing down is detrimental for the mother in cases of hypertension, heart disease etc.) was the chief indication followed by prolonged 2nd stage.^[4]

Regarding maternal injuries, the study in Cameroon, where the rate of instrumental deliveries was 2.3%, reported only minor vaginal and perineal lacerations, whereas in the present study with a rate of 3% instrumental deliveries, total 15 (12.5%) cases had maternal injuries.^[2] The minor cervical and vaginal lacerations were easily managed with a few extra sutures during episiotomy wound repair.

In the aforementioned Indian study forceps delivery was found to be significantly associated with episiotomy extension and perineal tears.^[4] The risk factors for 3rd and 4th degree perineal lacerations (i.e., complete perineal tears where the external anal sphincter is injured) as found in other studies were forceps delivery, nulliparity, increased baby weight and episiotomy.^[5-7] In the present study, out of the 4 cases of complete perineal tear, 3 were primigravida, 2 babies were large for gestational age and all cases had a mediolateral episiotomy. Complete perineal tears can occur in deliveries other than instrumental also when the baby weight is more, short perineum, poor perineal support during the delivery and sudden extension of the head or forceful delivery of shoulder of the baby. Proper hemostasis and careful suturing cures most of the cases. The patient requires liquid diet for 24 h and a low residue diet with stool softener for another 3 days and discharged

after she has passed stools and the wound looks healthy. Following a 34-year follow-up of forceps delivery Bollard *et al.* reported that significant perineal injuries after forceps delivery was no more than that seen in normal vaginal delivery.^[8] In another study, though instrumental delivery had a strong association, persistent occiput posterior position did not make an impact on the risk of complete perineal tear.^[9] Here, 6 cases were there with face to pubis delivery and 3 had minor perineal lacerations.

A study in Nigeria reported a strong correlation of oxytocin use, forceps delivery and fundal pressure with intra-partum uterine rupture.^[10] In this study, 2 cases of uterine rupture occurred. The first was a scar rupture in a case of previous LSCS where emergency laparotomy was carried out with rent repair. In women undergoing trial of vaginal birth after caesarean section, forceps application is recommended to cut short second stage to prevent prolonged bearing down by the mother, also these patients have a risk of intra-partum scar rupture of 0.7% as found by the National Institute of Child Health and Human Development Study.^[11] The other one was a multigravida with pre-labor membrane rupture where cervical priming agent prostaglandin E₂ gel was used, which unfortunately caused hyperstimulation leading to fetal distress necessitating forceps delivery. Uncontrolled hemorrhage from the posterior wall tear at laparotomy necessitated a supracervical hysterectomy. The reason for this rupture is unclear, if caused by instrument this must have resulted from a high or mid-cavity application of forceps, which is not recommended in modern day obstetric practice. Furthermore, in this study only low and outlet forceps were applied. The other possible explanation is hyperstimulation by the uterotonic agent prostaglandin in a multiparous uterus leading to a spontaneous rupture.

Regarding perinatal outcome, 12 (10%) babies had poor Apgar scores of less than 4 at 1 min requiring NICU admission out of which 11 were given back to the mother within 3 days. Fetal distress was the indication for forceps application in all but one of these cases. The indication of distress as such might have caused the poor Apgar scores in these babies rather than the use of an instrument. The decision of LSCS in fetal distress with a deeply engaged head in the birth canal would have led to delay in delivery due to shifting time to an operation theater a difficult head delivery during cesarean section as well as operative morbidity to the mother without improving the Apgar scores. Though, poor Apgar is commonly attributed to the use of forceps, another author has commented that this might be due to the labor process itself rather than the instrumentation.^[12] No external fetal injuries were noted

in the babies. One baby died due to asphyxia where failed vacuum extraction was followed by forceps application. Sequential use of multiple instruments has a poorer outcome according to RCOG guidelines and such use lead to this case of perinatal mortality in the study.

CONCLUSION

This art of delivery is a reasonable option to the obstetrician to reduce the rising cesarean section rates. However, extreme caution and judicious use of this instrument is required in expert hands to prevent risks for mother and fetus. Training programs should be conducted to impart knowledge about its indications, technique of use and quality control.

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How to cite this article: John LB, Nischintha S, Ghose S. Outcome of forceps delivery in a teaching hospital: A 2 year experience. *J Nat Sc Biol Med* 2014;5:155-7.

Source of Support: Nil. **Conflict of Interest:** None declared.