

A Clinical Evaluation of Forceps Delivery and its Associated Complications in Prolonged Second Stage of Labour

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Abstract

To study the clinical Evaluation of obstetrics forceps in patients with prolonged 2nd stage of labour and evaluate its associated neonatal and maternal outcomes. It was an observational cohort study over a period of one year from July 2013 to June 2014, conducted at JLN Medical college/Hospital, Ajmer. During this study period, a total of 19082 women were delivered, of which 512 underwent forceps assisted vaginal delivery. The data were collected on the structured pro-forma with variables like parity, booking status, number of maternal death after 2nd stage intervention, major obstetric hemorrhage, number of lateral vaginal wall tear, cervical tear, complete perineal tear, number of stillborn, early neonatal death, incidence of neonatal intensive care unit and sick newborn care unit admission, APGAR score at 1min. and 5min., rate of neonatal asphyxia, number of fetal scalp hematoma and facial injury. The frequency of second stage intervention (forceps) was 2.70%. The total number of Instrumental (forceps) vaginal deliveries conducted for prolonged second stage of labour was 220(1.15%). Most of the women were booked i.e., 168 (76.36%). 116(52.72%) of cases were between 18-20 years of age. 154(70%) were Primi-gravid. Maternal morbidity with instrumental (forceps) vaginal deliveries included vaginal tear in 12(5.45%) cases, cervical tear in 3(1.36%) cases, third degree perineal tear in 3(1.36%)cases and Post-Partum Hemorrhage (PPH) occurred in 16 (7.27%) cases. Out of 46 cases (20.91%) that reported for long-term follow up, only 2 had rectal incontinence. Perinatal complications of newborn included, 14 stillbirths (6.36%), 16(7.27%) early neonatal deaths, 18(8.73%) asphyxiated and 26(12.62%) grossly asphyxiated.

42(20.39%) babies required immediate sick newborn care unit admission after delivery. Minor injuries like scalp abrasion were recorded in only 6 cases.

Keywords

Instrumental vaginal delivery, Obstetric forceps, Neonatal Intensive Care Unit, Perineal tears, Sick Newborn Care Unit.

Abbreviations: *Neonatal Intensive Care Unit (NICU), Sick Newborn Care Unit (SNCU), Instrumental Vaginal Deliveries (IVD), Post-Partum Hemorrhage (PPH)*

I. Introduction

Labour and delivery is complex physiologic process resulting in to expulsion of product of conception from the uterus into the outside world [1]. This complex process involves two human beings, the mother and the baby. Approximately 10-20% of all deliveries require some form of obstetrical intervention [2]. Instrumental vaginal deliveries (forceps and vacuum extraction) account for 7-11% of deliveries [3- 4]. Even wider variations in the incidence of instrumental delivery has been reported from European hospitals [5]. If we have a look into the literature, we will find that there had been prevalence of severe maternal agony/ death and several fetal deaths associated with prolonged second stage. Perhaps the most infamous one was of princess Charlotte of England, who died after delivery of a 9 Lb stillborn baby following 50 hrs of labour. Unable to bear the responsibility the physician who handled the case, Sir Richard Crofts, committed suicide 3 months later. Obstetric histories of assisted vaginal delivery started with the invention of instrument designed to deliver women in

obstructed labour. The chamberlain family invented the modern obstetric forceps; 400 years ago, enabling to deliver baby alive for the first time [6]. From the day of invention, the obstetric forceps has gone through various criticisms along with various modes of evolution. As a result, we can appreciate the role of modern obstetrics forceps in routine practice. Meanwhile James Simpson, professor of midwifery from Edinburgh has been credited with inventing the first vacuum extractor in the 1840 [3]. From the very beginning these two methods were extensively used by the obstetrician for combating difficult delivery.

It is only in the last 20 years of different intervening methods, scientific evaluation of risks and benefits are discussed [6]. In the past, the ability to perform difficult vaginal delivery was an essential part of obstetric practice. In current practice where every outcome, any less than excellent, is strictly questionable, an obstetrician is always in great dilemma while deciding for termination of prolonged second stage of labour at that critical time. The skill of a good obstetrician includes the ability to manage a difficult and complicated vaginal

delivery. However, there is lack of practice guidelines that could be feasible and applicable in all set-ups. Nonetheless, obstetricians should have an experience in various methods of interventions and should take decision in favor of where benefits clearly outweigh the risk.

In Royal college of Obstetricians and Gynecologists (RCOG) consultant conference, operative vaginal delivery rate of 10.5% was reported (range 4-20%) while the consensus emphasize to lower it to average of 8.5% (range 5-15%) [7]. In Rajasthan (India), the majority of women deliver at home by unskilled traditional birth attendants or midwives. Remaining women are delivered in the healthcare set ups under supervision of doctors or consultant obstetricians or they are referred to major hospitals (like in this study) with prolonged or obstructed labour in moribund condition due to various risk factors. This study was carried out to estimate the percentage of operative vaginal deliveries with the help of obstetrics forceps in patients with prolonged 2nd stage of labour and evaluate the maternal, neonatal morbidity and perinatal complications associated with it. This study may guide obstetricians practicing in setups similar to our and other developing countries.

II. Patients and Methods

This observational cohort study was carried out at Department of obstetrics and Gynecology of J L N Medical College/hospital, Ajmer from July 2013 to June 2014.

Inclusion criteria for the study were; women having prolonged second stage of labour (For

nulliparous women: more than 2.8 hours without regional anesthesia and 3.6 hours with regional anesthesia. For multiparous women: more than 1 hour without regional anesthesia and 2 hours with regional anesthesia), with term, singleton pregnancy and fetus in vertex position. Women excluded in the study were; with pre-term pregnancy, non-vertex presentation, fetal distress, abruption placenta, heart disease, and gross cephalopelvic disproportion. All instrumental vaginal deliveries were conducted by senior resident doctors on duty. The data were collected on the pro-forma with variables like parity, booking status, number of maternal death after 2nd stage intervention, major obstetric hemorrhage, number of lateral vaginal wall tear, cervical tear, complete perineal tear, number of stillborn, early neonatal death, incidence of NICU and SNCU admission, APGAR score at 1min. and 5min., rate of neonatal asphyxia, number of fetal scalp hematoma and facial injury.

III. Results

During this study period, a total of 19,082 women delivered and the second stage intervention (forceps) was carried out in 515 women. Hence frequency of second stage intervention (forceps) was 2.70%. The total number of Instrumental (forceps) vaginal deliveries in prolonged second stage is 220 (1.15%). Most of the women i.e., 116 (52.72%) were between 18-20 years of age. Primigravida women were 154 (70%). Most of the women were booked i.e., 168 (76.36%).

Total 4 maternal deaths (1.81%) were recorded in the instrumental (forceps) vaginal delivery group though none of the death was directly related to the operative procedures or its complications. Maternal operative complications with instrumental (forceps) vaginal deliveries were vaginal tear in 12(5.45%) case, cervical tear in 3(1.36%) cases and third degree perineal tear in 3(1.36%) cases. Major obstetric hemorrhage in form of Post-Partum Hemorrhage (PPH) occurred in 16 (7.27%) cases. Only 46 women (20.91%) came for long term follow up. Out of them, only 2 had rectal incontinence and 1 had old complete perineal tear.

16(7.27%) early neonatal deaths. Out of these live births, 18(8.73%) asphyxiated, 26(12.62%) grossly asphyxiated and 162(78.64%) normally cried after birth. 42(20.39%) babies required immediate SNCU admission after delivery. Minor injuries like scalp abrasion were recorded in only 6 cases.

In Regard to the perinatal outcome, there were 206 live births, 14 stillbirths (6.36%) and

TABLE 1: DISTRIBUTION OF AGE, PARITY AND BOOKING STATUS OF PATIENTS

Variable	Instrumental vaginal deliveries (IVD)	%
Age(year)		
18-20	116	52.72
21-23	66	30
24-27	30	13.63
27-29	06	02.72
>30	02	0.90
Parity		
Primi Gravida	154	70
Multi Gravida	66	30
Booking Status		
Booked	168	76.36
Unbooked	52	23.64

TABLE 2: MATERNAL OUTCOME

Maternal outcome	Number	%
Death	4	1.81
Operative Complications		
Vaginal tear	12	5.45
Cervical tear	03	1.36
Third degree perineal tear	03	1.36
Obstetric Hemorrhage		
PPH	16	7.27

TABLE 3: FETAL/NEONATAL OUTCOME

Fetal outcome	Number	%
Neonatal Death		
Still born	14	6.36
Early neonatal death	16	7.27
Complications		
Asphyxiated	18	8.73
Grossly asphyxiated	26	12.73
Normally cried	162	78.64
SNCU Admission	42	20.39

IV. Discussion

The second stage interventions by instrumental vaginal delivery are associated with increased maternal and neonatal morbidity and mortality. The rates at which obstetricians intervene in prolonged second stage vary enormously as 1.5% in Czech Republic, as frequently as 15% in Australia and Canada [8]. Even within countries there are marked differences in rate of intervention. In this study the frequency of 2nd stage intervention is 2.70%. Incidence of instrumental (forceps) vaginal delivery was 1.15%. These figures could be attributed to many reasons as our hospital is a major referral hospital catering adjacent to 5 rural districts. Majority of the patients were referred from different hospitals after having failed trial of labour and being mismanaged in labour. Moreover, the background population is scattered over a huge area of rural Bengal with poor transport facility. Delay in the arrival at the emergency facility is also an attributing factor for the complicated outcome of interventions. The rate of cesarean section is escalating very rapidly, sometimes at the cost of increased utilization of hospital resources and at other times, at the expense of decreased instrumental vaginal delivery. Nowadays, the obstetricians are not frequently practicing this art of operative vaginal delivery. As a result, the scarce number of obstetricians proficient in obstetric forceps may further lead to a scarce number of experienced trainee doctors skilled in its application. The frequency of second stage intervention in the form of instrumental vaginal deliveries or emergency lower segment caesarean section was found high in

primigravida (70%) and in younger age group. This could be due to high rate of mismanagement, cephalopelvic disproportion, rigid perineum and lack of previous exposure/experience to labour process. Same was found in Feinstein et al., [9], study who found nulliparity as a risk factor in second stage arrest and Al-Kadri H et al., [10] who found nulliparous women having more chances of failed instrumental vaginal deliveries. Maternal morbidity in relation with instrumental delivery was in the form of vaginal tear (5.45%), cervical tear (1.36%), third degree perineal tear (1.36%). Another parameter analyzed to assay the maternal morbidity was incidence of PPH. There were 16 cases of PPH (7.27%) recorded in instrumental vaginal deliveries. 4 maternal deaths (1.81%) were recorded in instrumental vaginal deliveries group which were not directly related to the operative complications. These findings are somewhere less than that was recorded by Shahla Baloch et al., [11] Weerasekera DS et al., [12] have also found that vacuum and forceps delivery are associated equally with cervical tear, perineal tear and post-partum hemorrhage. The incidence of forceps delivery has been reduced in Nigeria because of high perinatal mortality and birth asphyxia (6-9%) [13-14]. Murphy DG, et al., [15] assessed the operative delivery in the second stage of labour in relation to fetal morbidity, and found it was more with the use of more than one instrument, more manipulation and also depends upon operative experience.

Observational data (in current study) on instrumental (Forceps) deliveries has suggested that obstetric forceps for prolonged

2nd stage of labour is associated with increased maternal, neonatal morbidity and perinatal complications. Therefore careful practice and proper selection of cases can minimize these risks with an aim to reduce unnecessary interventions. In hospitals with a poor resource setting (such as our hospital), cesarean sections are associated with bed occupancy for a longer time period as compared to the patients with assisted vaginal deliveries. Vaginal deliveries assisted with obstetric forceps in appropriately selected patients may help in reducing the cesarean section rate. It may also provide an opportunity to skilled obstetricians to teach the trainee doctors to acquire and apply the obstetrics forceps in imperative obstetrical situations.

V. Conclusion

Observational data on instrumental (forceps) deliveries suggested, obstetrics forceps for prolonged 2nd stage of labour is associated with increased maternal, neonatal morbidity and perinatal complications. Careful practice and proper selection of cases can minimize these risks with an aim to reduce unnecessary interventions.

VI. References

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