



ID-ENDS (Instrumental Delivery-Experience in Northeastern India, Descriptive Study)

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Abstract

Instrumental delivery, when done correctly in an appropriately chosen patient, has an excellent maternal and fetal outcome. It helps reduce second-stage caesarean section rates, which is a complex surgery with a grave effect on the future obstetric life of the patient. However, with the risks of medicolegal litigation in obstetrics practice.

Many obstetricians are comfortable performing a caesarean section as an intervention of choice in 2nd stage of labour, to avoid unforeseen complications due to a failed instrumental delivery.

Method: we have aimed to analyze instrumental delivery rates and associated outcomes in this retrospective study of 2 years in a tertiary care institute in North-eastern India, to assess the current trends in obstetrics.

Result: We found that 5.39% of total deliveries over a period of 2 years were instrumental deliveries. Most patients were primigravida and vacuum deliveries were used more preferably over forceps delivery. Episiotomy was used in 91% of cases with 3rd-degree perineal tear in 3 cases associated with forceps delivery. Also, only 12% of babies had NICU admission with uneventful recovery.

Conclusion: Thus, Instrumental delivery is an essential obstetric skill. When applied correctly on a rightly chosen patient, it has a high success rate and reduces the risk of 2nd stage cases are an section. Although current trends in obstetrics are limiting its role for fear of litigation in view of a failed instrumental delivery, this skill must be encouraged and protocols of instrumental delivery in the operation theatre must be encouraged in difficult cases.

Keywords: Instrumental Vaginal Delivery; Vacuum Delivery; Forceps Delivery; Caesarean delivery; Fetal Complications

Introduction

Instrumental vaginal deliveries are deliveries conducted with forceps or vacuum extraction for either maternal or fetal indications. Instrumental delivery, when done correctly in an appropriately chosen patient, has an excellent maternal and fetal outcome. It helps reduce second-stage caesarean section rates, which is a complex surgery with a grave effect on the future obstetric life of the patient.

Instrumental deliveries should be performed by an experienced obstetrician as it may have serious fetal complications like subgaleal hemorrhage, intracranial hemorrhage, skull fracture, and spinal cord injuries, and maternal complications like third and 4th-degree perineal tears and traumatic PPH. Current trends show that instrumental delivery is being replaced by 2nd stage caesarean as forceps and vacuum require higher skill, hence often being referred to as dying art. The American College of Obstetrics and Gynecology has recommended training in instrumental delivery to control and reduce the rates of caesarean section [1].

Thus, we aim to analyze instrumental delivery rates and associated outcomes in this retrospective study of 2 years in a tertiary care institute in North-eastern India, to assess the current trends in obstetrics.

Materials and Method

This is a retrospective observational study in the department of Obstetrics and Gynaecology at Northeastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS). We collected data on all instrumental deliveries between May 2020 to May 2022 and analyzed the data according to maternal demographic parameters, gestational age of delivery, baby weight, an indication of instrumental delivery, and maternal and perinatal outcomes. We observed out of 2667 deliveries in these 2 years, 144 were instrumental deliveries leading to a percentage of 5.39%.

Statistics

Descriptive statistics has been used to analyze data.

Result of our Study

5.39% of total deliveries over a period of 2 years were instrumental deliveries. Vacuum deliveries were done in 75% of cases when compared to forceps deliveries. Most patients were primigravida at 61.12% with a mean age of 26 years. The most common indication was a poor maternal effort with fetal distress at 90%. Also, the mean gestational age of delivery was 38 weeks in all patients with post-dated pregnancies being around 33.33%. The average birthweight of babies was 2.93kgs with the maximum being 3.96kgs. Also, episiotomy was required in 91% of cases. Around 12% of babies had low APGAR scores requiring NIC admission. 3 patients had 3rd-degree perineal tears and around 15% of patients had postpartum haemorrhage after delivery.

Discussion

Instrumental delivery is an essential obstetric skill, if correctly applied it can lead to successful vaginal deliveries reducing 2nd stage caesarean rates which is a complex surgery. However, with the risks of medico legal litigation in obstetrics practice, many obstetricians are comfortable performing a caesarean section as an intervention of choice in 2nd stage of labour, to avoid unforeseen complications due to a failed instrumental delivery. Our study thus aims to analyze the maternal and fetal outcomes in instrumental

deliveries, to appreciate how commonly obstetricians still use it in their daily practices.

In our study, the rate of instrumental delivery was 5.39% (144 cases). Only 26 cases of second-stage caesarean were observed during this period.

Between caesarean in labour and instrumental delivery, Polkowski, *et al.* conducted a retrospective analysis over an 11-year period to compare the outcomes for the mother and thefts. The 5-minute Apgar score was unaffected by the delivery method, although severe anaemia and hemorrhage risk were observed to be elevated in cs delivery women. The study concluded that vaginal instrumental delivery can be considered a safe alternative to second stage caesarean in labour with the right choice of indication and proper technique [2]. In our study, postpartum hemorrhage was observed in 15% of cases of instrumental delivery.

Tan PS and colleagues conducted a retrospective assessment of patients at Singapore General Hospital who endured a protracted second stage of labour between 2010 and 2012. One in four parturient requiring interventions for a prolonged second stage of labour underwent an emergency Caesarean [3].

The majority of patients in our study were primigravid and the average BMI of the patients was 23.5. In a study by Patterson, *et al.*, a trend of decrease in instrumental vaginal deliveries with increasing BMI was found, which was in line with the results of previous studies [5,6]. A reason speculated by the authors was, difficult instrumental delivery is usually not chosen over a caesarean, in a patient with a high BMI. Also, another explanation stated was, that the fetal head descent might be delayed among overweight women, and therefore Cesare an is chosen instead of instrumental vaginal delivery, in women with high BMI.

In our study, 75% of the cases of instrumental deliveries were via ventouse, thus suggesting more operator preference towards ventouse delivery when compared to forceps. In a Bofill, *et al.* research, 291 Obstetrics-Gynecology training programs in the US and Canada received a survey. 72% of respondents responded in total (210 of 291). The majority of programs (60%) were found to have an operational vaginal delivery rate of 10% or below. It was observed that the vacuum is the favoured tool in around one-third of training programs [7].

Literature also shows that Obstetric forceps use continues to decline in practice due to limited hands-on training, an exaggerated perception of the risks of short-term maternal and fetal injury, and subsequent litigation. Thus, many obstetricians opt for ventouse/vacuum delivery despite it having a higher failure rate and risk of neonatal injury. The alarming increase in caesarean rates around the world over the past 20 years, particularly in low- and middle-income countries, is a result of the diminishing trend in the use of obstetric forceps, which further hinders the training of OB-GYN residents [8]. Similarly, In the United Kingdom, the rates of instrumental vaginal delivery range between 10% and 15% [9]; these have remained fairly constant, although there has been a change in preference for instruments. In the 1980s most instrumental vaginal deliveries were by forceps, but by 2000, this had decreased to less than half. Much decline has been attributed to an increasing preference for vacuum extraction or caesarean section when complex vaginal delivery is anticipated [10].

In our study, 12% of the newborns born via instrumental delivery required NICU admission for low Apgar scores, all of which were associated with ventouse delivery. A common argument against the use of forceps or vacuum extraction is linked to the potential trauma suffered by the newborn. However, these complications generally disappear within hours or weeks and neonatal injury is extremely uncommon in both procedures. Shihadeh, *et al.* at Queen Alia Hospital in Jordan examined data on 150 women who underwent forceps birth and 420 women who underwent vacuum extraction between 1995 and 1999. They evaluated the maternal and newborn morbidity associated with these two delivery methods. He noted that infants born with vacuum extraction had much higher rates of caput, jaundice, and cephalo hematoma and significantly higher rates of maternal birth canal and genital tract lacerations. For both groups, severe newborn morbidity was uncommon [11].

3 cases of obstetric and sphincter injury were noted in our study which were associated with force ps delivery. Johnson, *et al.* investigated the success rate of operative vaginal delivery and the risk of rectal sphincter injury when forceps or vacuum was used. For both occipital anterior and posterior cases, forceps were associated with a higher success rate than the vacuum, but with a greater risk of rectal sphincter injury. The use of either vacuum or

forceps from the occiput posterior position was associated with a higher likelihood of rectal injury and a lower likelihood of vaginal delivery when compared with the occiput anterior position [12]. Combs, *et al.* examined 2832 consecutive forceps and vacuum extraction deliveries to determine risk variables for perineal tears during instrumental delivery. Midline episiotomy, null parity, second-stage arrest, occiput posterior position, low or mid station, use of forceps instead of vacuum, use of local anesthesia, and Asian race factors were all linked to an elevated risk for third- and fourth-degree lacerations. The study concluded that the operator must recognize the patient at risk for perineal tear, use mediolateral episiotomy, and use vacuum extraction rather than forceps to prevent perineal laceration [13]. 91% of our cases had an episiotomy, there by justifying the low rate of obstetric and anal sphincter injury in our study.

In our study population, a failed trial of instrumental delivery occurred in 6 cases that required 2nd stage caesarean section. All cases required Neonatal intensive care (NICU) admission for the baby, however, recovery was uneventful in all. In their study, Reach, *et al.* Compared the mother and newborn morbidity caused by an unsuccessful attempt at an instrumental delivery with the effects of having a caesarean section immediately at the second stage of labour. A retrospective review of all second-stage caesarean births performed in a tertiary care teaching hospital between January 1986 and December 1992 was conducted. Of the 29,457 live births, there were 326 cases in which a caesarean section was carried out immediately during the second stage of labour and 75 women in whom an instrumental delivery attempt (using forceps in 33 cases and a vacuum in 25 cases) had failed. None of the outcome characteristics for either the mother or the newborn were different across the three instrumental groups or the direct-to-caesarean section group. The study came to the conclusion that a failed instrumental delivery using forceps or a vacuum is not linked to an increased risk of morbidity for either the mother or the child [14]. A trial of instrumental delivery in the operating room (ToD) has been suggested as a workable substitute for CS for expected challenging deliveries, providing prompt access to CS in the case of failure. The 2011 RCOG Green-top Guidelines for Operative Vaginal Delivery provided a list of factors that are predictive of challenging instrumental deliveries, including elevated maternal BMI, estimated fetal weight over 4,000 g, fetal

occipital posterior position, and mid-cavity deliveries, proposing that such deliveries should be taken into consideration for ToD, ostensibly to reduce unnecessary Caesarean section [15]. This is because a delay between a failed surgical vaginal delivery and CS can cause fetal morbidities.

Limitation

The retrospective design and relatively small sample size of our study were limitations. Sometimes the documentation was not thorough enough, which could have impacted the correctness of our conclusions.

Conclusion

Instrumental delivery is an essential obstetric skill. When applied correctly on a rightly chosen patient, it has a high success rate and reduces the risk of 2nd stage caesarean section. Although current trends in obstetrics are limiting its role for fear of litigations in view of

failed instrumental delivery, this skill must be encouraged and protocols of instrumental delivery in the operation theatre must be encouraged in difficult cases.

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