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Original Research Article

# Maternal and Neonatal Outcomes of Instrumental Vaginal Deliveries Using Forceps and Vacuum: A Retrospective Study

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**Abstract:**

**Background:** Instrumental vaginal delivery using forceps or vacuum extractor is an important obstetric intervention used to assist delivery during the second stage of labour when spontaneous vaginal birth is not progressing or when rapid delivery is required for maternal or fetal indications.

**Aim:** To compare maternal and neonatal outcomes of instrumental vaginal deliveries using forceps and vacuum extraction.

**Methodology:** A retrospective observational analytical study was conducted in the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital, Patna, Bihar, over one year. Sixty cases of instrumental vaginal delivery were included, comprising 30 forceps-assisted and 30 vacuum-assisted deliveries. Data regarding maternal characteristics, indications for intervention, neonatal outcomes, maternal complications, and duration of hospital stay were collected from hospital records and analyzed using descriptive statistics and comparative tests.

**Results:** The majority of women were aged 21–30 years in both groups. Foetal distress (50%) was the most common indication for forceps delivery, whereas prolonged second stage of labour (46.7%) was the primary indication for vacuum extraction. Neonatal complications were slightly higher in the forceps group (16.7%) compared with the vacuum group (6.7%). Maternal complications were also more frequent with forceps (23.4%) than vacuum (3.3%). The mean hospital stay was marginally longer in the forceps group (7.4 ± 1.2 days) compared with the vacuum group (6.9 ± 1.0 days).

**Conclusion:** Both forceps and vacuum extraction are effective methods of assisted vaginal delivery; however, vacuum-assisted delivery was associated with fewer maternal and neonatal complications.

**Keywords:** Instrumental vaginal delivery, Forceps delivery, Vacuum extraction, Maternal outcomes, Neonatal outcomes, Assisted vaginal birth.



## Introduction

Instrumental vaginal delivery is the significant element of contemporary obstetric practice and is used when the second stage of labour needs support in terms of vaginal birth. It is conducted with the help of special tools, mainly forceps or vacuum extractors, to help deliver the fetus when the spontaneous vaginal birth is not going on well or in cases where the birth that is required to be fastened in case of maternal or fetal signs. Instrumental delivery is still a useful obstetric intervention that may be used to prevent caesarean section in the right clinical context that will produce positive outcomes not only to the mother but also to the newborn. In the world, it is estimated that between 10 and 20 percent of the birth processes need some kind of assistance during the birth process, which underscores the fact that the use of instrumental techniques in obstetric care is still pertinent [1].

Out of the existing tools, obstetric forceps is one that has a rich history of use and has been in place for centuries to assist vaginal birth. The forceps work by capturing the fetal head and exerting pulling force to aid delivery and be in control of the movement direction within the birth canal. Although they are effective, forceps need a lot of clinical skill and experience because it is possible to achieve maternal and neonatal trauma in case of inappropriate use. With time, the issues related to the complications related to the use of forceps, such as perineal tears, maternal soft tissue trauma, and infant facial or head trauma,

have helped to attract the progressive change towards other ways of assisted birth.

The vacuum extractor on the other hand is a relatively new obstetric device that is applied to assisted vaginal delivery. Even though the theory of vacuum extraction was already published over 50 years ago by Malmstrom in 1954, it has not gained popularity and widespread acceptance until recently. The progress in design and better clinical trials made in the last three decades have been a contributing factor to the rise in the use of vacuum extraction in obstetric practice [2]. Contemporary vacuum extractors have been advanced in terms of having a better-shaped cup that can be easily attached to the fetal skull causing minimal trauma to the baby. These technological gains have been instrumental in improving the safety profile of the vacuum-assisted deliveries.

Over the past few years, vacuum extraction has become a relatively popular method of delivery in comparison with forceps delivery because it is relatively simple, less exigent in terms of the technical expertise required, and it is perceived to be safer [3] than forceps delivery. Neonatal injury-related complications and other related complications have been reduced due to the newer designs of the vacuum cups which are currently under development. These inventions have enhanced the effectiveness and safety of the vacuum-assisted vaginal delivery thus making it a choice in most obstetric units. The vacuum extractor is used to fix the fetal head to the scalp of the fetus by negative pressure, which is used to lift the fetus after the contraction of the uterine muscles to help the fetal head to drop and deliver.

Some studies carried out in the global society have compared the outcomes of maternal and neonatal between vacuum extraction and forceps deliveries. These studies have given evidence that vacuum extraction is related to a reduced risk and severity of trauma to both mother and fetus. Moreover, vacuum-assisted delivery is also linked to the decreased analgesic needs in the course of the procedure and is regarded as less complicated to conduct in particular clinical conditions [4]. These benefits have led to increased use of vacuum extraction in most clinical practices as opposed to the use of forceps. Nevertheless, both approaches have certain cues, benefits and possible complications and the selection of the tool greatly depends on the clinical situation, experience of the practitioner and the institutional guidelines [5].

Irrespective of the existence of methods of instrumental delivery, caesarean section has grown tremendously in most regions across the globe during the past decades. Despite the fact that caesarean section may be a lifesaving operation in cases that are medically necessary; it is also linked to high maternal morbidity, especially when it is undertaken on the second labour [6]. A caesarean section that is delivered in the process of the second stage of labour is more difficult technically and poses greater risk of developing complications than those that are delivered at an earlier stage of labour. Such complications might encompass interest extension of the uterine incision, severe haemorrhage, blood transfusion, damage to the bladder, and increased risk of admission to the intensive care units [7,8].

Besides the direct dangers of the second-stage caesarian sections, long-term effects of the practice on subsequent pregnancies also exist. The complications encountered by women who deliver through caesarean section include the rupture of the uterine scar during the subsequent delivery as well as the dangers related to repeated caesarean delivery. These complications grow with every successive caesarean birth, and this raises issues about the reproductive health of women who deliver more than one child through surgical birth in the long run [9]. Consequently, effective and safe substitutes of caesarean section, including instrumental vaginal delivery, are necessary to minimize the number of unnecessary surgical interventions and enhance the health outcomes of mothers.

Additionally, successful vaginal delivery in the first pregnancy produces significant consequences in the subsequent pregnancies. Research has also proven that women experiencing a vaginal birth during their first pregnancy have a high likelihood 78 to 91 percent of giving birth spontaneously in subsequent pregnancies [10]. This indicates the significance of advocating and safely supporting vaginal delivery as much as possible, even by using suitable instrumental delivery methods. Assisted vaginal delivery can thus be a key in the decrease of the first caesarian section and enhancement of long-term obstetric results [11].

Instrumental vaginal delivery is not a risk-free method, despite having a number of advantages. Perineal tears, post-partum hemorrhage, and soft tissue injuries are some of the possible maternal complications. In rare cases, neonatal complications could be scalping injuries, cephalohematoma, facial nerve palsy, and intracranial hemorrhage. These complications can be many and serious, and it might be dependent on whether the practitioner is trained and experienced, the time of the procedure, and the health condition of a mother and a fetus. Thus, patient selection requires special attention, appropriate clinical practices, and sufficient training of medical staff to reduce negative outcomes.

In the context of the current debate about the relative safety and effectiveness of both types of delivery forceps and vacuum-assisted, maternal and neonatal outcomes related to these methods should be constantly monitored. Retrospective studies have a useful role as they may give an insight on the actual clinical outcome and may help to see the trends of

the complications related to various obstetric procedures. This type of research will be able to play a role in evidence-based decision-making and optimization of obstetric care practices.

## Methodology

**Study Design:** This study was a retrospective observational analytical study conducted to assess the maternal and neonatal outcomes associated with instrumental vaginal deliveries using forceps and vacuum (ventouse). The study involved reviewing previously recorded clinical data of women who underwent instrumental vaginal delivery. The outcomes of deliveries conducted using forceps were compared with those conducted using vacuum extraction to evaluate differences in maternal and neonatal complications.

**Study Area:** The study was carried out in the Department of Obstetrics and Gynaecology at Netaji Subhas Medical College and Hospital, Bihta, Patna, Bihar, India.

**Study Duration:** The study was conducted over a period of one year January 2024 to December 2024.

**Sample Size:** A total of 60 cases of instrumental vaginal deliveries were included in the study. The cases were divided into two groups:

- **Group A:** Forceps-assisted vaginal delivery – 30 cases.
- **Group B:** Vacuum (Ventouse)-assisted vaginal delivery – 30 cases.

**Study Population:** The study population consisted of pregnant women who underwent instrumental vaginal delivery during the second stage of labour at Netaji Subhas Medical College and Hospital. Both primigravida and multigravida women who required assistance with delivery using forceps or vacuum extraction were included in the study. Data regarding maternal characteristics, indications for instrumental delivery, and neonatal outcomes were obtained from the hospital records.

**Data Collection:** Data were collected retrospectively from labour room registers, patient medical records, operative notes, and neonatal records maintained in the Department of Obstetrics and Gynaecology. Relevant information such as maternal age, parity, gestational age, indication for instrumental delivery, type of instrument used, and maternal complications such as perineal tears, cervical or vaginal injury, and postpartum hemorrhage were recorded. Neonatal variables including birth weight, Apgar score at 1 and 5 minutes, neonatal trauma, and admission to neonatal intensive care unit (NICU) were also documented. All the collected information was recorded in a predesigned data collection proforma for systematic analysis.

### Inclusion Criteria

The following cases were included in the study:

- All pregnant women who underwent instrumental vaginal delivery (forceps or vacuum) during the second stage of labour.
- Indications for instrumental delivery included:
    - Foetal distress
    - Non-progression of second stage of labour
    - Need to shorten second stage of labour
    - Poor maternal effort or maternal exhaustion

### Exclusion Criteria

The following cases were excluded:

- Malpresentations (brow, face, breech)
- True cephalopelvic disproportion
- Contracted pelvis
- High fetal station above +1
- Presence of large caput succedaneum
- Incomplete or missing medical records

**Procedure:** Instrumental vaginal deliveries were performed in the labour room according to standard obstetric protocols. For forceps delivery, Wrigley forceps were used when the cervix was fully dilated and the fetal head was engaged. The patient was placed in the lithotomy position and the perineal area was cleaned with antiseptic solution and draped. Local anesthesia was administered through perineal infiltration. The left blade of the forceps was inserted first followed by the right blade, and after proper locking of the blades, episiotomy was performed when required. Traction was applied in the direction of the pelvic axis, initially downward and then upward and forward as the head descended.

For vacuum-assisted delivery, the vacuum cup was lubricated and introduced into the vagina after appropriate case selection and confirmation of prerequisites. The cup was applied to the fetal scalp at the flexion point with the knob directed towards the occiput. Suction was gradually created starting from 0.2 kg/cm² and increased every two minutes until a maximum negative pressure of 0.8 kg/cm² was achieved. Episiotomy was performed when necessary. Traction was applied along the axis of the pelvis, initially downward and then progressively upward as the fetal head emerged.

**Statistical Analysis:** The collected data were entered into Microsoft Excel and analyzed using appropriate statistical software such as the Statistical Package for Social Sciences (SPSS). Descriptive statistics including mean, standard deviation, frequency, and percentage were used to summarize the data. Comparative analysis between the forceps and vacuum groups was performed using the Chi-square test for categorical variables and Student's t-test for

continuous variables. A p-value of less than 0.05 was considered statistically significant."

**Result**

Table 1 shows the age distribution of patients in the forceps and vacuum groups. The majority of patients in both groups were in the 21–30 years age group, accounting for 76.7% in the forceps group and 66.7% in the vacuum group. Patients aged up to 20 years constituted 13.3% in the forceps group and 20% in the vacuum group, while those aged 31–40 years represented 10% and 13.3% in the forceps and vacuum groups respectively. The mean age of patients was 24.1 ± 3.2 years in the forceps group and 24.8 ± 3.9 years in the vacuum group, indicating that most participants were young adults.

**Table 1: Distribution of Patients According to Age (Years)**

| Age (Years) | Forceps Group (n=30) | | Vacuum Group (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| Up to 20 yrs | 4 | 13.3 | 6 | 20 |
| 21–30 yrs | 23 | 76.7 | 20 | 66.7 |
| 31–40 yrs | 3 | 10 | 4 | 13.3 |
| **Total** | **30** | **100** | **30** | **100** |
| **Mean ± SD** | 24.1 ± 3.2 years | | 24.8 ± 3.9 years | |

Table 2 shows the distribution of patients according to maternal high-risk factors in the forceps and vacuum groups. Most patients in both groups had no associated high-risk factors, accounting for 76.7% in the forceps group and 80% in the vacuum group. Among the identified risk factors, severe anaemia and hypothyroidism were observed in 6.7% of cases each in the forceps group, while hypothyroidism (6.7%) and pre-eclampsia (6.7%) were the most common in the vacuum group. Gestational diabetes mellitus was present in 3.3% of cases in both groups, whereas cardiac problems (3.3%) were noted only in the forceps group. Overall, maternal high-risk conditions were relatively uncommon and similarly distributed between the two groups.

**Table 2: Distribution of Patients According to Maternal High-Risk Factors**

| Maternal High-Risk Factors | Forceps (n=30) | | Vacuum (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| Severe anaemia | 2 | 6.7 | 1 | 3.3 |
| Cardiac problems | 1 | 3.3 | 0 | 0 |
| Pre-eclampsia | 1 | 3.3 | 2 | 6.7 |
| Gestational diabetes mellitus | 1 | 3.3 | 1 | 3.3 |
| Hypothyroidism | 2 | 6.7 | 2 | 6.7 |
| No risk factors | 23 | 76.7 | 24 | 80 |
| **Total** | **30** | **100** | **30** | **100** |

Table 3 shows the indications for instrumental vaginal delivery in the forceps and vacuum groups. In the forceps group, the most common indication was foetal distress (50%), followed by maternal exhaustion (20%), prolonged second stage of labour (16.7%), and prophylactic use for medical disorders (13.3%). In the vacuum group, the most frequent indication was prolonged second stage (46.7%), followed by maternal exhaustion (26.7%), foetal distress (13.3%), and prophylactic indications (13.3%). These findings indicate that forceps were more commonly used in cases of foetal distress, whereas vacuum extraction was more frequently employed for prolonged second stage of labour.

**Table 3: Indications for Instrumental Vaginal Delivery**

| Indications | Forceps (n=30) | | Vacuum (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| Foetal distress | 15 | 50 | 4 | 13.3 |
| Maternal exhaustion | 6 | 20 | 8 | 26.7 |
| Prolonged second stage | 5 | 16.7 | 14 | 46.7 |
| Prophylactic (medical disorder) | 4 | 13.3 | 4 | 13.3 |
| **Total** | **30** | **100** | **30** | **100** |

Table 4 presents the distribution of newborns according to birth weight in the forceps and vacuum delivery groups. In the forceps group, the majority of babies weighed 2–2.5 kg (60%), followed by 2.6–3 kg (26.7%), 3.1–3.5 kg (10%), and >3.5 kg (3.3%). In contrast, most babies in the vacuum group had a

birth weight of 2.6–3 kg (56.7%), followed by 2–2.5 kg (26.7%), 3.1–3.5 kg (13.3%), and >3.5 kg (3.3%). Overall, lower birth weight babies were more common in the forceps group, whereas babies weighing 2.6–3 kg were more frequently delivered using vacuum extraction.

**Table 4: Distribution of Patients According to Birth Weight**

| Birth Weight | Forceps (n=30) | | Vacuum (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| 2–2.5 kg | 18 | 60 | 8 | 26.7 |
| 2.6–3 kg | 8 | 26.7 | 17 | 56.7 |
| 3.1–3.5 kg | 3 | 10 | 4 | 13.3 |
| >3.5 kg | 1 | 3.3 | 1 | 3.3 |
| **Total** | **30** | **100** | **30** | **100** |

Table 5 shows the fetal complications associated with instrumental vaginal delivery using forceps and vacuum. In the forceps group, cephalhematoma occurred in 1 case (3.3%), facial marks and abrasions in 2 cases (6.7%), and hyperbilirubinemia in 2 cases (6.7%). In the vacuum group, cephalhematoma was observed in 1 case (3.3%) and hyperbilirubinemia in 1 case (3.3%), while no cases of facial marks or abrasions were reported. The majority of newborns had no fetal complications, accounting for 83.3% in the forceps group and 93.3% in the vacuum group. Overall, fetal complications were slightly more common in forceps-assisted deliveries compared to vacuum-assisted deliveries.

**Table 5: Foetal Complications of Instrumental Vaginal Delivery**

| Foetal Complications | Forceps (n=30) | | Vacuum (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| Cephalhematoma | 1 | 3.3 | 1 | 3.3 |
| Facial marks and abrasions | 2 | 6.7 | 0 | 0 |
| Hyperbilirubinaemia | 2 | 6.7 | 1 | 3.3 |
| No foetal complications | 25 | 83.3 | 28 | 93.3 |
| **Total** | **30** | **100** | **30** | **100** |

Table 6 presents the maternal complications associated with instrumental vaginal delivery using forceps and vacuum. In the forceps group, vaginal lacerations occurred in 2 cases (6.7%), cervical lacerations in 3 cases (10%), and extension of episiotomy in 2 cases (6.7%). In contrast, the vacuum group showed fewer complications, with only 1 case (3.3%) of cervical laceration and no cases of vaginal lacerations or episiotomy extension. The majority of patients in both groups had no maternal complications, accounting for 76.6% in the forceps group and 96.7% in the vacuum group. Overall, maternal complications were observed more frequently with forceps-assisted delivery compared to vacuum-assisted delivery.

**Table 6: Maternal Complications of Instrumental Vaginal Delivery**

| Maternal Complications | Forceps (n=30) | | Vacuum (n=30) | |
|---|---|---|---|---|
| | No | % | No | % |
| Vaginal lacerations | 2 | 6.7 | 0 | 0 |
| Cervical lacerations | 3 | 10 | 1 | 3.3 |
| Extension of episiotomy | 2 | 6.7 | 0 | 0 |
| No maternal complications | 23 | 76.6 | 29 | 96.7 |
| **Total** | **30** | **100** | **30** | **100** |

Table 7 shows the distribution of patients according to the duration of hospital stay following forceps and vacuum-assisted deliveries. In the forceps group, the majority of patients (60%) stayed for 7–8 days, followed by 26.7% who stayed 5–6 days, and 13.3% who required a longer stay of 9–10 days. Similarly, in the vacuum group, most patients (53.3%) stayed for 7–8 days, while 40% stayed 5–6 days, and only 6.7% required 9–10 days of hospitalization. The mean hospital stay was slightly longer in the forceps group (7.4 ± 1.2 days) compared to the vacuum group (6.9 ± 1.0 days), suggesting a marginally shorter postoperative recovery period in patients delivered using vacuum assistance.

| Table 7: Frequency of Patients According to Hospital Stay | | | | |
|---|---|---|---|---|
| **Days of Stay** | **Forceps (n=30)** | | **Vacuum (n=30)** | |
| | **No** | **%** | **No** | **%** |
| 5–6 days | 8 | 26.7 | 12 | 40 |
| 7–8 days | 18 | 60 | 16 | 53.3 |
| 9–10 days | 4 | 13.3 | 2 | 6.7 |
| **Total** | **30** | **100** | **30** | **100** |
| **Mean Hospital Stay** | 7.4 ± 1.2 days | | 6.9 ± 1.0 days | |

## Discussion

The median age of the mothers in the forceps group (24.1 + 3.2) and the vacuum group (24.8 + 3.9) was approximately in the twenties, which means that the majority of instrumental births were carried out by young women in their twenties. It concurs with other studies that have been done before by Shekhar et al. (2013) [12] and Prameela et al. (2015) [13], where the mean age of women who had instrumental vaginal delivery was reported to be approximately 23 years or 25 years in both forceps and vacuum groups. The same demographic patterns have been realized in other obstetric studies which imply that women in the reproductive age of 20-30 years form the largest clients who are subject to operative vaginal delivery because the women in this age group experience high birth rates."

The majority of women in both groups in the current study did not exhibit any important maternal risk factors with 76.7% of the women in the forceps group and 80% in the vacuum group not having any comorbidities. Only few were with severe anaemia, hypothyroidism, pre-eclampsia, gestational diabetes mellitus, or cardiac disease. Similar results were also observed by Prameela et al. (2015) [13], who found that most of the instrumental deliveries happened in women who had no significant antenatal complications, which suggested that instrumental vaginal delivery is frequently undertaken in otherwise healthy pregnancies when there are signs of labour difficulties. This trend advocates the idea that intrapartum factors are the main determinants of operative vaginal delivery, and not maternal systemic disease.

Concerning signs of instrumental vaginal delivery, foetal distress was the most prevalent sign of forceps delivery in our research with 50 percent of cases involving foetal distress and the most frequent sign of vacuum extraction was prolonged second stage of labour (46.7 percent). Maternal exhaustion was also a cause of 20 percent forceps delivery and 26.7 percent vacuum assisted delivery. Such observations are in line with the results of Shihadeh and Al-Najdawi (2001) [14] who indicated that foetal distress was the most common predictor to forceps delivery and increased second stage was more likely in vacuum extraction. Equally, in their study, Achanna and Monga (1994) [15] discovered that the prevalence of vacuum extraction was characterized by longer second stage of labour and poor maternal effort with the results of the prolonged labour being about 66 percent in vacuum extraction compared to 58 percent in forceps deliveries. These parallels bring out the clinical preference of obstetricians to pull the babies with the use of forceps as the foetus is compromised and in situations where vacuum delivery is necessary to decrease the second phase of labour.

The results of the distribution of the birth weight of the neonates in the current study revealed that most of the babies that were delivered using forceps were between 2-2.5 kg (60%), and the majority of the babies in the vacuum group fell between 2.6-3 kg (56.7%). These results are not different to Shihadeh and Al-Najdawi (2001) [14], who reported that 66.67 percent of infants delivered using forceps and 76.18 percent delivered using vacuum weighed 2.5-4 kg. This resemblance implies that instrumental vaginal delivery is typically carried out on babies with normal birth weights and that extreme birth weights are rather rare in the given practice because of the increased risks of complications.

In the study of neonatal complications, they were not very common in both groups. Cephalhematoma was present in 3.3% of neonates in the forceps and vacuum groups and facial marks and abrasions were only present in the former (6.7%). Hyperbilirubinemia was noted in 6.7 and 3.3% of forceps and vacuum cases respectively. These are similar to the findings of the study with Johnson et al. (2004) [16] who found cephalhematoma in about 3 per cent of forceps and 9 per cent of vacuum deliveries. Similarly, Shihadeh and Al-Najdawi (2001) [14] also found a rate of 1.67% cephalhematoma in the forceps group, and 4.76% in the vacuum group. In a number of studies, facial abrasions and marks have also been more frequently reported with forceps delivery, which aligns with the results of our analysis. All in all, the rates of neonatal complications of the current study were not high, which may indicate that forceps and vacuum extraction were rather safe when applied correctly.

The present study also revealed a higher maternal complication in forceps group than in vacuum group. Cervical lacerations were seen in 10 per cent of the patients in the forceps group and 3.3 per cent in the vacuum group and vaginal lacerations (6.7), episiotomy extension (6.7) were only observed in the forceps group. On the other hand, most women in the vacuum group (96.7) had no maternal

complications. The same results were also reported by Achanna and Monga (1994) [15], who reported higher rates of vaginal and cervical lacerations in forceps delivery than in vacuum extraction. Another finding by Shihadeh and Al-Najdawi (2001) [14] was that severe perineal injury, vaginal laceration, and cervical tears were massively high in the forceps group ($p < 0.01$). These investigations substantiate the finding that the trauma of the birth canal by the mother is more often linked with the use of forceps, which could be attributed to the hard metallic blades and increased force used during the intervention.

The length of stay in the hospital in the current study had a slight difference whereby the mean of the forceps group is 7.4 Days, and the mean of the vacuum group is 6.9 Days. The difference was not significant, but the patients who were delivered with the help of vacuum were more likely to be discharged sooner, perhaps because of the lack of maternal complications. The same has been observed in other studies comparing operative vaginal delivery, in which vacuum extraction would tend to be linked with a reduced maternal trauma and a faster postpartum healing (Shekhar et al., 2013; Johnson et al., 2004) [12,16].

In general, the results of the current study are correlated with the majority of the past studies that have compared the use of forceps and vacuum-assisted deliveries. Forceps may be necessary in cases where the delivery has to be made quick and mostly when the foetus is in distress and vacuum extraction may be utilized in cases where the second stage of labour is expected to be lengthy and the mother is exhausted. Mothers are found to be more affected in complications of birth canal, especially during births by use of forceps, but among neonatal complications, the incidence is relatively low and there is no significant difference between the two methods. These results support the continued use of both instruments in modern obstetric practice, with the choice of instrument depending on clinical indications, operator experience, and maternal and foetal conditions.

## Conclusion

The present retrospective study compared maternal and neonatal outcomes of instrumental vaginal deliveries using forceps and vacuum. Most women undergoing instrumental delivery were in the young reproductive age group, and the majority had no associated high-risk maternal factors. The common indications for instrumental delivery included fetal distress, maternal exhaustion, and prolonged second stage of labour. Neonates delivered with both instruments had a generally favorable birth weight distribution and a high proportion experienced no significant complications, although minor neonatal issues were occasionally observed. Maternal complications were relatively infrequent but were slightly more commonly associated with forceps use compared with vacuum extraction. The duration of hospital stay was comparable in both groups. Overall, both forceps and vacuum were found to be effective and relatively safe methods for assisted vaginal delivery when used with appropriate clinical judgment and proper technique.

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