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Original Research Article

Instrumental deliveries and its outcome in tertiary care center

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ABSTRACT

Background: Objective of the study was to determine the incidence and indication of assisted vaginal deliveries and to compare the fetal and maternal outcome of vacuum and forceps deliveries.
Methods: This study done over a period of one and half year from March 2022 to August 2023 at NRI Medical College, Chinnakakani. Total number of vaginal deliveries are 1617, out of which 33 had a successful assisted vaginal delivery and studied in terms of maternal and fetal outcome. Verbal consent was taken, indication for instrumental application documented and pre requisites fulfilled before instrument application.
Results: Out of 1617 vaginal deliveries in our institute, 33 cases successful underwent assisted vaginal deliveries in which 49% were vacuum assisted, 51% were forceps assisted deliveries. Most common indication for instrument application were fetal distress (51%), failure of maternal forces followed by maternal exhaustion (30%). We had 2nd degree perineal tear - 2 (11.76%), cervical tear - 1 (5.88%), PPH-1 (5.88%), 1- vaginal laceration (6.25%) as maternal complications. Out of 16 vacuum and 17 forceps deliveries, 5/16 (31.25%) and 8/17 (47.06%) were admitted in NICU respectively.
Conclusions: In the present study showed that most common indication for assisted vaginal deliveries are fetal distress and maternal exhaustion. Maternal complications are seen more in forceps deliveries when compared to vaccum. There is no significant difference between vaccum and forceps deliveries in neonatal complications when compared.

Keywords: Forceps delivery, Vaccum delivery, Assisted vaginal delivery, Maternal and fetal outcome

INTRODUCTION

Instrumental vaginal delivery is birth accomplished with assistance from forceps or a vacuum cup device. once these are applied to the fetal head, outward traction generates forces that augment maternal pushing to deliver the fetus.[1] It is a procedure help in cut short 2nd stage of labor which decrease birth rates by caesarean sections.[2] Also use of forceps and vacuum is common in modern obstetric practice in case of fetal distress or prolonged 2nd stage of labor. Incidence of forceps and vacuum deliveries are 49% and 51% respectively. Mother and their newborn morbidity and even mortality cannot be avoided due to instrumental delivery. Complication due to instrumental delivery can be minor complications like tears of vagina mucosa and cervical tear and major complication associated with traumatic haemorrhage, third- and fourth-degree tears.[3] The goal of instrumental vaginal delivery is to assist the vaginal birth providing minimum maternal and neonatal morbidity. High level of clinical and technical skills are required and therefore, adequate training is necessary for the use of both instruments.[4] Caesarean section in the second stage of labour is associated with an increased risk of major complications like obstetric haemorrhage, prolonged hospital stay and admission of the baby to the special care baby unit compared with completed instrumental delivery.[5] when operator familiar with the indications, contraindications, application, and use of the particular instrumental and maternal complications get reduces so, experience matters than the instrument. Globally, about 10–20% of all deliveries need some form of assistance or intervention at the time of

delivery and 6-12% of these interventions are by Instrumentation Incorrect application of instrument leads to cervical tears, haemorrhage (primary PPH), injury to the urinary bladder, anal sphincter, uterine rupture and damage to the pelvic floor. Fetal minor complications of Instrumental deliveries especially due to forceps include soft tissue trauma, cephalohematoma, jaundice, and transient brachial plexus injury. Hypoxic-ischemic encephalopathy, intracranial and subgaleal haemorrhage, seizures, cranial fracture and permanent brachial plexus injury, admission to the neonatal intensive care unit (NICU) and death are fatal complications. A neonate who is assisted by vacuum deliveries had a greater proportion of NICU admissions compared to spontaneous deliveries and the mortality rate was higher in the vacuum.[6] The obstetrician prefer vacuum than forceps due to its apparent increased safety and easy to use. Studies done in Europe and USA indicate showed similar commonest indication for vacuum delivery as our study, which includes prolonged second stage of labour, fetal distress, followed by prolonged second stage and poor maternal effort. From those who conducted vacuum deliveries the successes rate reaches about 85.7% and the failed extractions were 14.3% delivered by caesarean sections. The occurrence of complications with vacuum delivery were primary postpartum haemorrhage (9.5%), fetal complication (31%) and cephalohaematoma (18.1%). A study done in Ethiopia showed that commonest indication of vacuum application was fetal distress 92 (43%), prolonged 2nd stage 67 (31.3%), to shorten the second stage 34 (15.9%) and poor maternal effort 21 (9.8%). Even though vacuum used more frequently in the many health institutions, research works on the prevalence of vacuum vaginal delivery and its indication and outcome was not conducted.[10]

Objective

Objective of the study was to determine the incidence and indication of assisted vaginal deliveries and to compare the fetal and maternal outcome of vacuum and forceps deliveries.

METHODS

It is retrospective study carried for one and half year from March 2022 to August 2023 at NRI Medical College, Chinnakakani. Total number of vaginal deliveries are 1617, out of which 33 had a successful assisted vaginal delivery and studied in terms of maternal and fetal outcome. Verbal consent was taken, indication for instrumental application documented and pre requisites fulfilled before instrument application.

Inclusion criteria

Women in labour with vertex presentation with failed maternal forces in the second stage/maternal exhaustion; patient with prolonged 2nd stage; fetal distress in 2nd stage of labor, maternal conditions like eclampsia, severe anaemia, and cardiac disease were included.

Exclusion criteria

Patients with cephalopelvic disproportion, contracted pelvis, and deep transverse arrest were excluded.

Statistical analysis

Statistical analysis expressed in terms of percentage. Fischer's test and Chi-square test were used to evaluate maternal and fetal complications between vacuum and forceps. In terms of statistics, a p value less than 0.05 was deemed significant.

RESULTS

During study period there was total of 1617 vaginal deliveries in our institute out of which 33 underwent successful assisted vaginal deliveries. Out of 33 assisted vaginal deliveries 49% were vacuum assisted, 51% were forceps assisted deliveries.

Indications for assisted delivery

Most common indication for instrument application were fetal distress (51%), 2nd most common cause - maternal exhaustion (30%). Vacuum used for fetal distress in 13 (81.25%) cases out of 16 cases and remaining used for failed maternal forces (12.5%). Mostly forceps used in maternal exhaustion (47%) i.e., 8 out of 17 forceps deliveries and 4 (23.53%) out of 17 for fetal distress (Table 1).

Maternal complications

Out of 33 assisted vaginal deliveries 5 maternal complication were noted. The complications in forceps deliveries are 2nd degree perineal tear - 2 (11.76%), cervical tear - 1 (5.88%), and PPH - 1 (5.88%). The complications in vacuum deliveries are vaginal laceration (6.25%) in vacuum delivery. P value is 0.17, maternal complication between vacuum and forceps shows no significant difference (Table 2).

Table 1: Comparison of indications between vacuum and forceps.

Indications	Vacuum	%	Forceps	%
Fetal distress	13	81.25	4	23.53
Failed maternal force	2	12.5	8	47.06
Fetal bradycardia	0	0	2	11.76
Non descent of head	0	0	3	17.65

Continued.

Indications	Vacuum	%	Forceps	%
Face to pubis	1	6.25	0	0.00
Total	16	100	17	100.00

Table 2: Comparison of maternal complications between vacuum and forceps.

Maternal complications	Vacuum	%	Forceps	%
2nd degree perineal tear	0	0	2	11.76
Cervical tear	0	0	1	5.88
PPH	0	0	1	5.88
Laceration	1	6.25	0	0.00
Nil	15	93.75	13	76.47
Total	16	100	17	100.00

Table 3: Comparison of neonatal complications between vacuum and forceps.

NICU admission	Vacuum	%	Forceps	%
Yes	5	31.25	8	47.06
No	11	68.75	9	52.94
Total	16	100	17	100.00

Neonatal complications

Out of 16 vacuum and 17 forceps deliveries. 5/16 (31.25%) and 8/17 (47.06%) were admitted in NICU respectively p value 0.35, neonatal complication between vacuum and forceps shows no significant difference (Table 3).

DISCUSSION

Instrumental vaginal delivery (IVD) is a key element of essential obstetric care, and significantly reduces maternal and newborn morbidity and mortality especially in resource poor countries. In trends of growing number of caesarean deliveries and morbidities associated with it, the instrumental vaginal delivery is a great tool to prevent the primary as well as repeat caesarean delivery by intervening at crucial time. Due to decrease complications in vacuum application. there has been a gradual shift from the use of forceps to the vacuum over the years. This may be because the vacuum is safer, the skill is more easily acquired, and it has an in-built safety mechanism. With comparison to vacuum, application of forceps is technically more difficult and requires time to acquire the skill. The rate of instrumental deliveries was fairly constant during the period under review despite the rising caesarean section rate unlike in developed countries where the rates are declining due to litigations.[4]

Even though deliveries by vacuum extraction and forceps are certainly not a substitute for caesarean delivery, they are safe obstetric practices with many benefits when protocols are followed by reducing morbidity of mother and neonate and can be accomplished more quickly than caesarean delivery.[11]

According to 2006 American College of Obstetricians and Gynaecologists (ACOG) Survey on Professional Liability, 37.1% of obstetricians reported increasing their rate of caesarean sections due to fear of litigation. Above survey's aim was to discuss the present indications and techniques of operative vaginal delivery with forceps and vacuum extractors, which also discussed about the efficacy data for both forceps versus vacuum deliveries and for operative vaginal delivery versus normal spontaneous vaginal delivery versus caesarean delivery; and review current literature evaluating both short- and long-term maternal and neonatal outcomes with both forceps and vacuum deliveries.[7] Vacuum delivery was associated with lower rates of maternal morbidity and mortality when compared with Caesarean delivery due to dystocia and fetal distress. Pelvic station did not significantly show the associations between forceps or vacuum and perinatal or maternal morbidity and mortality.[8] Fetal distress is the most common indication in modern obstetrics for instrumental delivery. In the present study also, the most frequent indication for instrumental deliveries was fetal distress (45.3%). In above study fetal distress was the most common indication for instrumental deliveries (46.3%). In above study on instrumental deliveries showed that second most common indication for instrumental delivery was maternal exhaustion (23.9%). Prolonged 2nd stage of labour (i.e., where delivery is delayed for more than two hours in primigravida and more than one hour in multigravida after full dilatation of the cervix) was the indication for instrumentation among 10.7% of women. In a study in Texas University the most common indication was fetal distress followed by poor maternal efforts, same as our present study. In an Indian study by Singh et al, cutting short of 2nd stage of labour (i.e., where prolonged bearing down is detrimental for the mother in cases of hypertension, and heart disease) was the chief indication followed by prolonged 2nd stage.[9] In present study comparison to other study instrumental deliveries need skills, efficiency and practice to perform instrumental

deliveries without maternal and neonatal morbidity such as perineal tear, laceration, forceps marks on neonate.

CONCLUSION

Both forceps and vacuum extractors are acceptable and safe instruments for operative vaginal delivery. While candidates should be selected on an individualized basis and counselling done for both partner and patient. accordingly, the skill of the operator should also influence the decision to attempt an operative delivery as well as the choice of instrument. vacuum delivery is associated with decreased rates of severe maternal morbidity and mortality. In present study showed that most common indication for assisted vaginal deliveries are fetal distress and maternal exhaustion. Maternal complications are seen more in forceps deliveries when compared to vacuum, with prior proper preparation of patient and local anaesthesia, emptying of bladder with strong perineal support, we can prevent maternal complication with forceps. There is no significant difference between vacuum and forceps deliveries in neonatal complications when compared. Modern days instrumental deliveries decrease number of 2nd stage caesarean section so that we can prevent morbidity of mother and neonate. In my study we had improvement of normal vaginal deliveries outcome with instrumentation.

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