



Comparison of Maternal and Neonatal Outcomes in Outlet Forceps and Vacuum Extraction Deliveries

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Abstract:

Aims: To compare the maternal and neonatal outcome between forceps and vacuum extractions deliveries.

Methods and materials: A total of 100 patients were retrospectively analysed to compare the outcome between forceps (N=50) and vacuum application (N=50) between January 2015 to December 2015 in a tertiary care hospital. The indications for instrumental delivery were fetal distress, failure of descent of head, to cut short second stage of labor, poor maternal efforts. Maternal outcomes were analysed in terms of genital tract injuries (vaginal tears, cervical tears) perineal hematoma, paraurethral tears, postpartum hemorrhage. Neonatal outcomes were analysed in terms of APGAR scores, neonatal trauma (bruise marks, clavicular fractures), Cephalhematoma, Respiratory Distress Syndrome, NICU admissions. and neonatal mortality. The 2 groups were compared using paired T test with $p < 0.05$ is statistically significant. The data were analysed using SPSS soft ware version 16.

Results: The most common age group in both the groups were between 21-29 years. Primigravida women with gestational age between 37-40 weeks more commonly required instrumental delivery in both the groups. Fetal Distress was the most common indication (42%) for vacuum application and poor maternal efforts (36%) is the most common indication for forceps. The maternal morbidity was higher in forceps compared to vacuum (58% Vs .40%). Amongst maternal morbidities seen, genital tract injuries (perineal laceration, episiotomy extension and cervical tears) were most common both arms but more in forceps arm which is statistically significant. Amongst the fetal morbidity noted, Neonatal Trauma (Bruises, abrasion, clavicular fracture) was more common in forceps application comparative to vacuum (16% Vs 2%). Cephalhematoma was noted only with vacuum applications (12% Vs 0 %). NICU admission was significantly more in forceps application compare to vacuum (32 % Vs 24%).

Conclusion: Vacuum application has a better maternal and neonatal outcome compared to forceps delivery, except cephalhematoma in the neonate which is increasing seen with vacuum application.

Introduction

Instrumental vaginal deliveries is an integral component for skilled obstetric care which improves outcome of vaginal delivery and reduces

the caesarean section rate. The 2nd stage of labour is a dynamic event and may require assistance. Assisted vaginal delivery is conducted with the use of forceps or ventouse (vacuum assisted

vaginal delivery) Vaginal delivery being assisted by instruments can either be vacuum extraction or forceps, a choice based on obstetrician's competence and training¹. James Young Simpson was the first to use traction to deliver the baby. It was later modified by Malstrom in 1953. The obstetric forceps had its history from the time of Chamberlain family in the seventh century.

Assisted vaginal delivery, with the use of forceps or vacuum/ventouse, offers the option to accomplish safe delivery for the mother and the clinician. Modern obstetrics practice has witnessed an increase in the caesarean section rates everywhere. WHO recommends 10–15% caesarean section rate to achieve optimal maternal and neonatal safety. A successful assisted vaginal delivery avoids caesarean section, its attendant uterine scar and its implications for future pregnancy. Modern obstetric practice has witnessed an increase in the caesarean section trend. Reintroduction of this art-operative vaginal delivery will definitely find a place in emergency obstetric care. This study was designed to assess the maternal and neonatal outcome of vacuum and forceps assisted vaginal deliveries.

Material and Methods

This is a retrospective observational study which was carried out in the department of Obstetrics and Gynecology, BGS Global Institute of Medical

Sciences, Bangalore over a period of one year from January 2015 to December 2015. Fifty consecutive cases of forceps and ventouse deliveries each (total 100cases, 50 forceps and 50 ventouse deliveries) over this period were included, all of which were singleton pregnancies with fetus in cephalic presentation. The forceps used was Wrigley's outlet forceps and for vacuum extraction silastic 40mm and 60mm cups were used. The negative pressure applied was up to 0.6kg/cm.

Right mediolateral episiotomy and perineal infiltration (lignocaine) was done as a routine. Cases were scrutinized for demographic data, gestational age and indication for instrumental delivery. The various indications for instrumental delivery were fetal distress, failure of descent of head, to cut short second stage of labor, poor maternal efforts. Maternal outcomes were analysed in terms of genital tract injuries (vaginal wall tear, cervical tear) perineal hematoma, paraurethral tears, postpartum hemorrhage,. Neonatal outcomes were analysed in terms of APGAR scores), neonatal trauma (bruise marks, clavicular fractures), Cephalhematoma, Respiratory Distress Syndrome, NICU admissions. and neonatal mortality. The 2 groups were compared using paired T test with $p < 0.05$ is statistically significant. The data were analysed using SPSS soft ware version 16.

Results

Table 1: Comparison of Demographic Profile in both the groups

	Vaccum(%)	Forceps(%)
Maternal Age		
≤20 years	10(20)	08(16)
21-29 years	32(64)	31(62)
≥ 30 years	08(16)	11(22)
Parity		
Primigravida	31(62)	28(56)
Multigravida	19(38)	22(44)
Gestational Age		
37-40 weeks	27(54)	31(62)
> 40weeks	23(46)	19(38)

The most common age group in both the groups were between 21-29 years. Primigravida women with gestational age between 37-40 weeks more

commonly required instrumental delivery in both the groups as shown in table no 1.

Table 2: Indication for Application

	Vaccum(%)	Forceps(%)
Fetal Distress	21(42)	17(34)
Poor Maternal efforts	16(32)	18(36)
Prolonged 2 nd stage of labour	04(8)	08(16)
Failure of Descent	03(6)	01(2)
To cut short 2 nd stage of labour		
Severe Anaemia	02(4)	03(6)
Severe PIH	01(2)	02(4)
Cardiac Disease	01(2)	01(2)
VBAC	02(4)	--

Fetal Distress was the most common indication(42%) for vaccum application and poor

maternal efforts (36%) is the most common indication for forceps as shown in table no 2.

Table 3 : Maternal Outcome

	Vaccum(%)	Forceps(%)
Normal	30(60)	21(42)
Perineal laceration/Episiotomy extension/Cervical tears	14(28)	19(38)
Perineal Hematoma	00	2(4)
Para urethral lacerations	02(4)	2(4)
Post Partum hemarrhage	4(8)	6(12)

The maternal morbidity was higher in forceps compared to vacuum (58% Vs .40%). Amongst maternal morbidities seen, genital tract injuries (perineal laceration, episiotomy extension and

cervical tears) were most common both arms but more in forceps arm which is statistically significant as shown in the table no 3. There were no maternal mortality seen in both the arm.

Table 4: Neonatal Out come

	Vaccum(%)	Forceps (%)
Normal Baby	26(52)	16(32)
Low APGAR		
<4 at 1 minutes	1(2)	4(8)
<7 at 5 minutes	4(8)	6(12)
Neonatal Trauma: Bruises/abrasion/ Clavicular fracture	1(2)	8(16)
Cephalhematoma	6(12)	0
NICU admission/ RDS	12(24)	16(32)

RDS- Respiratory Distress Syndrome, NICU- Neonatal Intensive care Unit.

Amongst the fetal morbidity noted, Neonatal Trauma (Bruises, abrasion, clavicular fracture) was more common in forceps application comparative to vacuum (16% Vs 2%). Cephalhematoma was noted only with vacuum applications (12% Vs 0 %). NICU admission was significantly more in forceps application compare to vacuum (32 % Vs 24%) as shown in table no 4.

Discussion

In our study primigravida women with gestational age between 37-40 weeks more commonly required instrumental delivery in both the groups (vaccum and forceps) a finding similar to the reported rates in an earlier studies⁶. Episiotomy was given as a routine in all the patients. Fetal Distress was the most common indication (42%) for vaccum application and poor maternal efforts (36%) is the most common indication for forceps.

In a study in Texas University the most common indication was fetal compromise and failure to deliver spontaneously with maximum maternal effort, which agrees with our present study. Our findings differed from Singh A et al, where cutting short of second stage of labor was the chief indication followed by prolonged 2nd stage of labour⁹.

In our study maternal morbidity was higher in forceps compared to vacuum (58% Vs .40%). Amongst maternal morbidities seen, genital tract injuries (perineal laceration, episiotomy extension and cervical tears) were more common in both the groups but more in forceps application which is statistically significant. There were no maternal mortality seen in both the groups Johnson et al reported a high incidence of maternal third and fourth degree perineal lacerations and vaginal lacerations with the use of forceps¹⁰. While a study in Cameroon reported only minor cervical and vaginal lacerations in cases of instrumental deliveries¹¹.

Regarding neonatal outcome, neonatal trauma (Bruises, abrasion, clavicular fracture) was more common in forceps application comparative to vacuum (16% Vs 2%). In our study cephalhematoma was noted only with vacuum applications (12% Vs 0 %). NICU admission was significantly more in forceps application compare to vacuum (32 % Vs 24%). A review of the literature yields divergent views about the effects of vacuum extraction on the newborn. However, most authors agree that serious neonatal injuries are rare with vacuum extraction^{6,8,10,12}. Neonatal well-being assessed by Apgar scores was no different among the two groups, consistent with other reports^{4,6,9,10}.

Conclusion

Our study concludes that in need of instrumental delivery, vacuum application has a better maternal and neonatal outcome compared to forceps delivery, except cephalhematoma in the neonate which is increasing seen with vacuum application.

Conflict of interest: None

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