ORIGINAL ARTICLE

Comparison of Neonatal and Maternal Outcome between Forceps and Vacuum Delivery

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ABSTRACT

Objectives: To evaluate the neonatal and maternal morbidity, associated with the use of two instruments, and to evaluate which is safer and more effective of the two.
Study design: Cross sectional analytical study.
Setting: Department of Obstetrics and Gynaecology, Fatima Memorial Hospital, Lahore.
Duration of study: Six months.
Subjects and methods: This cross sectional study was carried out at Fatima Memorial Hospital, Lahore over a period of SIX months.120 pregnant women meeting the inclusion criteria were registered. Risks/benefits explained, informed consent taken. A detailed history taken, examination done, Baseline investigations (CBC, blood group, urine C/E.BSR, USG) done.60 patients were selected for forceps delivery.60 patients for vacuum extraction.
Results: The mean age of patients in vacuum group was 25.58 years, and 26.67 years in forceps group. Most of the patients were primigravida,53.33% in vacuum group and 61.67% in forceps group.61.67% patients were booked in vacuum group and 58.33% in forceps group3.33% patients had 3rd degree perineal tears in vacuum group and11.67% patients in forceps group. 4th degree perineal tear was found in 10% patients in forceps group and none in vacuum group.30% babies delivered through vacuum and 36.67% babies delivered by forceps, had an apgar score <7/10 at 1 minute. After 5 minutes 8.33% neonates in vacuum group and 15% in forceps group had an apgar score <7/10. Cephalhaematoma was seen in 20% neonates in vacuum group, and 5% neonates in forceps group.
Conclusion: Vacuum causes much less maternal morbidity in terms of third and fourth degree perineal tears while most of the neonatal morbidities are insignificant in comparison with both instruments.
Key words: Vacuum delivery, neonatal, forceps

INTRODUCTION

Assisted vaginal delivery offers the option of an operative procedure by which a fetus can be delivered safely and quickly .Successful operative delivery avoids caesarean section and its complications. Vacuum extraction and obstetric forceps are operative procedures used during complicated vaginal deliveries. There is considerable disagreement concerning the preferred method. The use of both the obstetrical forceps and vacuum extraction is not risk free and when applied under unfavourable circumstances may lead to serious damage to mother as well as the baby. The rational of this research is to consider success of operative vaginal delivery ,and to compare the complications of forceps versus vacuum assisted deliveries to conclude which instrument will be better option to decrease the maternal and neonatal morbidity.

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Instrumental vaginal delivery remains an important facet of modern obstetric practice. In United Kingdom, the rates of instrumental vaginal delivery ranges between 10%-15% and this has remained fairly constant over the past few decades[1].

Vacuum extraction and obstetric forceps are operative procedures used during complicated vaginal deliveries. They are indicated for a non reassuring fetal heart rate, prolonged second stage, intrapartum haemorrhage, maternal exhaustion and in patients with heart disease to shorten second stage. Vacuum associated vaginal birth is often associated with shoulder dystocia and cephalhematoma. Forceps delivery is more often associated with third and fourth degree perineal lacerations[2].

Although vacuum extraction does have risks, it remains a safe alternative to forceps delivery[3]. Obstetricians in many countries continue to prefer forceps , although the prime reason for this is likely to be tradition and training. Other reasons given include

inability to maintain a vacuum and presence of leaks in tubing[4].

For both occipitoanterior and posterior cases, the use of forceps was associated with higher success rate than the vacuum, but with greater risk of anal sphincter injury .The use of either vacuum or forceps for the occipitoposterior position was associated with a higher likelihood of rectal injury and lesser likelihood of vaginal delivery when compared with the occipitoanter position[5]. The optimal technique in the use of forceps and vacuum should result in a minimum of maternal and neonatal morbidit[1].

Most women still aim for spontaneous vaginal delivery. If complications do arise during labour it should be possible to offer women suitable alternatives and not solely caesarean section[6].

Difficult deliveries in which vacuum was followed by forceps or either procedure was followed by caesarean section, had adverse outcomes than, procedure that was successful in the first attempt[3].

MATERIAL AND METHODS

Total 120 patients (Booked/Unbooked).60 patients selected for forceps delivery (Group 1)60 patients for vacuum delivery (Group ll). This cross section analytical study was carried out in the Department of Obstetrics and Gyanaecology ,Fatima Memorial Hospital, Lahore for a period of six months. Sampling technique was prospective non probability convenient sampling. All those patients with singleton pregnancy, cephalic presentation and gestation of 36 completed weeks and onwards were included in the study. Patients with pevious H/O caesarean section, gross congenital anomalies and suspected or known fetal coagulopathies were excluded.

One hundred and twency pregnant women meeting the inclusion criteria registered. The risk and benefits explained. An informed consent using their data in research obtained. A detailed history, (including demographics , age, parity, duration of gestation),duration of 1st and 2nd stage of labour, analgesia, reason for assisted vaginal delivery and birth weight recorded .Detailed examination ,Abdominal, Vaginal examination done, and labour monitored as per labour room protocol and partogram maintained. 60 patients selected for forceps delivery and 60 patients for vacuum extraction.

Data collection done by using the variables as described.

The instruments were either silastic cup vacuum extractor or obstetric forceps;Wrigley`s outlet forceps or Neville Bomes low cavity forceps. The collected data analyzed accordingly by SPSS version 11.The variables analysed included demographics (age, parity, booking status, duration of gestation), duration of 1st and 2nd stage of labour, analgesia, reason for instrumental delivery and birth weight. Also examination findings, per abdominal and vaginal analysed. The findings were analyzed as simple descriptive mean and standard deviation of the quantitative data. The qualitative data presented as mean and percentages. The routine investigations presented as mean and standard deviations.

The outcome variables (complications) presented as frequency, percentages, and chisquare used to asses any difference between the two groups with reference to the instrument used. The P value to be significant will be taken as equal to or less than 0.05.

RESULTS

Results were compiled after studying the specific variables. A total of 120 patients were selected for this study and divided into two groups i-e 60 patients in each group. The mean age of the patients in vacuum group was 25.85 yrs and mean age in forceps group was 26.27 years.Majority of the patients were between 20to30 years of age,54(90%)in vacuum group and 55(91.66%)in forceps group(Table 1).

In terms of the distribution of parity among mothers delivered by instrumental deliveries, most of the patients were primigravida,32(53.33%)in vacuum group and 37(61.67%) in forceps group (Table 2). The number of booked patients in vacuum group was 37(61.67%)and 35(58.33%)in forceps group.(Table 3)

3rd and 4th degree perineal tears were compared in Table 4,where 2(3.33%) patients had 3rd degree prineal tears in vacuum group and 7(11.67%) patients in forceps group.4th degree perineal tears were found in 6(10%) patients in forceps group and none in vacuum group.So this complication(3rd and 4th degree perineal tear was significantly higher in forceps group. Regarding the apgar score , 18 babies(30%) delivered by vacuum had an apgar score of less than 7/10 at 1 minute while 22 babies (36.67%) delivered by forceps group had an apgar score of less than 7/10 at 1 minute. After 5 minutes of delivery 5(8.33%) neonates in vacuum group and 9(15%) in forceps group had an apgar score of less than 7/10 (Table 5&6).

The significant fetal complication in vacuum group was cephalhaematoma which was seen in 12 patients(20%) and only 3(5%)patients in forceps group. Subconjuctival hemorrhage was insignificant and was seen in 3(5%) patients in vacuum group, and 2(3.33%) patients in forceps group. Shoulder dystocia was also insignificant, 1(1.66%) in vacuum group and 2(3.33%) in forceps group.(Table 7).

Table 1: Distribution of Mothers according to their age undergoing instrumental delivery

Age in years	Vacuum delivery (n=60)	Forceps delivery (n=60)
20-25	29(48.44%)	32(53.33%)
26-30	25(41.67%)	23(38.33%)
31-35	6(10%)	5(8.34%)
Mean ± SD	25.85 ± 4	25.27± 3.97

P value: 0.877 (> 0.05)

Table 2: Parity among mothers undergoing instrumental delivery

Parity	Vacuum delivery (n=60)	Forceps delivery (n=60)
Primigravida	32(53.33%)	37(61.67%)
Multigravida (upto 2)	28(46.67%)	23(38.33%)

P value: 0.460

Table 3: Distribution of cases according to booked/ unbooked status

Booked/ unbooked	Vacuum delivery (n=60)	Forceps delivery (n=60)
Booked	37(61.67%)	35(58.33)
Unbooked	23(38.33%)	25(41.67%)

P value: 0.852

Table 4: Maternal morbidity in forceps and vaccum delivery groups

Morbidity Perineum	Vacuum delivery (n=60)	Forceps delivery (n=60)	P value
3rd degree tears	2(3.33%)	7(11.67%)	0.032
4th degree tears	-	6(10%)	0.027

Table 5: Distribution of neonates according to Apgar score at 1 minute

Apgar Score	Vacuum delivery (n=60)	Forceps delivery (n=60)
< 7	18(30%)	22(36.67%)
>7	42(70%)	38(63.33%)

P value: 0.560 (> 0.05)

Table 6: Distribution of neonates according to Apgar score at 5 minute

Apgar Score	Vacuum delivery (n=60)	Forceps delivery (n=60)
< 7	05(8.33%)	9(15%)
>7	55(91.67%)	51(85%)

P value: 0.394 (>0.05)

Table 7: Neonatal morbidity in forceps and vaccum delivery groups

Morbidity	Vacuum delivery	Forceps delivery	P Value
Cephalohaematoma	12(20%)	03(5%)	0.013
Sub- conjuctival haemorrhage	03(5%)	02(3.33%)	0.648
Shoulder dystorcia	02(3.33%)	01(1.6%)	0.559

Significant (P< 0.05) Insignificant (P> 0.05)

DISCUSSION

Instrumental vaginal delivery remains an integral part of obstetrician`s duties over the world .When there is a valid indication for expediting the birth of baby, instrumental vaginal delivery rather than caesarean section may be selected on the basis of a number of factors. With the use of epidural analgesia, there is increase in the rate of instrumental deliveries[7].

In this study, majority of the patients were between 20 to 30 years of age, 54(90%) in vacuum group and 55(91.66%)in forceps group.

In this study, regarding parity among mothers undergoing instrumental delivery ,majority were primigravida ;among them 37(61.67%) primgravida were delivered by forceps and 32(53.33%) patients were delivered by vacuum. These results are comparable to another study carried out at Riyadh in year 2000, in which 70% of forceps deliveries and 49% of vacuum delivery were carried out in primigravidae[8]. These findings are also in agreement with another study (local study) conducted by Akhtar[9]

This study shows that apgar score less than 7 at 1 minute was seen in 30% babies delivered by vacuum as compared to 36.67% babies delivered by forceps. There was no significant difference between the two groups.

In this study, the apgar score less than 7 at 5minutes was seen in 8.33% babies delivered by vacuum as compared to 15%babies delivered by forceps deliveries. There was no significant difference between the two groups.

A study conducted by Feldman DM also shows that there is no significant difference in apgar score at 1 minute and 5 minutes between the vacuum and forceps deliveries[10].

In this study, while comparing the maternal morbidity regarding perineal tears vacuum group was having significantly lower complications than forceps group, as only 2(3.33%)had 3rd degree perineal tears compared to 7(11.6%) patients in forceps group; and 6(10%)patients had 4th degree perineal tears in forceps group while none in vacuum group.

Our findings were in agreement with a study conducted by Johanson RB, Menon BK[11] at North Staffordshire hospital NHS Trust, UK. In his study he also found that vacuum assisted vaginal delivery had significantly less maternal trauma. Similar findings were also found in a study conducted by Johanson RB et al[12], at University of Cape Town, South Africa.

While only one study was found with the conclusion that there was no significant difference in the incidence of third degree perineal tear in comparison with vacuum assisted deliveries when forceps deliveries are performed[13]. This difference may be due to the application techniques.

In our study, cephalhaematoma was found in 12(20%) of babies in vacuum group as compared to 3(5%) in forceps group. hile comparing our results with the study of Johason et al[14] neonates delivered with vacuum had more cephalhaematomas than forceps deliveries. In another study by Weerasekera and Premaratne[73] also, the forceps deliveries were having lower incidence of cephalhaematomas in the neonates as compared to vacuum deliveries.

In this study, while comparing shoulder dystocia in both groups, vacuum assisted deliveries were having slightly higher rate of this complication but overall there was not a significant difference between both the groups. Our results are confirmed by a study conducted by Caughey AB, Sandberg PL, and colleagues[15].

CONCLUSION

Maternal injuries are more common with the use of forceps. Neonates delivered with vacuum have more cephalhaematomas subconjunctival haemorrhages and shoulder dystocia.

Based on the results of this study it would seem justified to conclude that when there is an indication for instrumental vaginal delivery, vacuum should be preferred over forceps, as it causes much less maternal morbidity in terms of third and fourth degree perineal tears, while most of the neonatal morbidities are insignificant in comparison with both instruments.

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