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Research Article

Comparison of Normal Vaginal and Operative Vaginal Delivery

Savita Rani Singhal[1]*, Rakhee Goyal[1], Anju Huria Khosla[1] and Smiti Nanda[1]

[1]Department of Obstetrics & Gynecology, Pt. B.D. Sharma Postgraduate Institute, Medical Sciences, Rohtak

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***Corresponding author(s)**

Dr. Savita Rani Singhal, Department of Obstetrics & Gynecology, Pt. B.D. Sharma Postgraduate Institute, Medical Sciences, Rohtak, India,
Tel- 09416631920, 0091-1262-283643;
Email: savita06@gmail.com

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Abstract

Background: There is a periodic demand to discourage operative vaginal delivery, however clinical experience suggests that leaving everything to natural forces or scalpel does not accomplish the goal, thus making it an integral part of obstetric care worldwide.

Aims and Objectives: The present study was aimed to compare the maternal and perinatal outcome in operative vaginal delivery and normal vaginal delivery.

Patients and Method: It is a prospective study carried out on 200 pregnant women with full term pregnancies admitted in the labor ward of tertiary referral teaching hospital. The patients were divided into 2 groups of 100 each. Group I (Study group) included 100 women delivered either by outlet forceps (50 women) or silastic vacuum (50 women) and Group II (Control group) consisted of 100 women who had normal delivery. The maternal outcome measures were extension of episiotomy, cervical tears, vulval hematoma, altered fecal or urinary continence, perineal discomfort and dyspareunia. Perinatal outcome measures were Apgar score, injuries to newborn and admission to neonatal intensive care unit.

Results: Maternal complications, extension of episiotomy (p=0.01, RR 2.71, 95% CI 1.19-6.17)), cervical tears (p=0.01, RR 10.0, 95% CI 1.30-76.67) and vulval hematoma (p=0.01, RR 5.00, 95% CI 0.59-42.04)) were significantly more in group I. Apgar score less than seven at five minutes was observed in 5% neonates in group I and none in group II. Neonatal injuries (scalp injuries, facial injuries, cephalhematoma) were seen in 25% cases in-group I and none in group II. 32% neonates in group I and 7% in group II were admitted in neonatal intensive care unit (p=0.00, RR 4.57, 95% CI 2.12-9.87). At three months postpartum the perineal discomfort was complained by 14% and 9% of women and 13% and 8% of the women experienced dyspareunia in the group I and group II respectively.

Conclusion: Operative delivery cause more complications in both mothers and babies compared to normal delivery, but all these complications are minor in nature. So, instrumentation in the second stage of labor remains useful and alternative procedures to cesarean section, if applied judiciously. There is no difference in terms of perinatal and maternal outcome in forceps and vacuum delivery.

Introduction

Operative vaginal deliveries are accomplished by applying direct traction on the fetal skull with forceps or by vacuum extractor [1]. There is periodic and vocal demand to delete assisted vaginal delivery, however clinical experience suggests that leaving all to natural forces or the scalpel will not accomplish this goal [2]. Assisted vaginal delivery is an integral part of obstetric care worldwide. It may be performed as infrequently as in 1.5% of deliveries or as often as in 15% [3].

The termination of labor by forceps or vacuum is indicated in any condition threatening the mother or fetus, provided it can be accomplished safely. Maternal indications include heart disease, pulmonary disease, pregnancy induced hypertension, exhaustion or prolonged second-stage labor. Fetal indications for operative vaginal delivery include fetal distress, prolapse of the umbilical cord and premature separation of the placenta [2].

Various maternal complications after instrumental delivery are perineal tears, cervical tears, rupture uterus, postpartum hemorrhage, puerperal sepsis, dyspareunia, and fecal and anal incontinence. Neonatal Complications following forceps or vacuum application include scalp lacerations and bruising, subgaleal haematoma, cephalhaematoma, intracranial hemorrhage, neonatal jaundice, subconjunctival hemorrhage, clavicular fracture, shoulder dystocia, Erb's palsy, retinal hemorrhage and fetal death [1].

Complications can occur even during normal vaginal delivery. These include uterine inertia, shoulder dystocia, extension of episiotomy, vaginal and cervical lacerations, postpartum hemorrhage, rupture uterus, shock, birth asphyxia, intracranial hemorrhage, scalp lacerations, clavicular fracture etc. Perineal trauma at the time of delivery can result in dyspareunia, perineal pain, urinary and anal incontinence later on [4]. Instrumental delivery and third degree perineal tears are recognized as the most significant risk factors for subsequent continence problems [4].

In view of all this the present study was planned to see the detrimental effects, if any of operative vaginal delivery and to compare it with normal vaginal delivery, in our patient population.

Table I: Various parameters in study and control groups.

	Group I (n=100) Mean±SD	Group II (n=100) Mean±SD	Statistical Significance
Age (Years)	23.33±3.31	23.15±2.20	t=0.42 p>0.05 (NS)
Parity	0.29±0.59	0.35±0.56	t=0.73 p>0.05 (NS)
Gestational age (Weeks)	39.42±1.09	39.46±1.17	t=0.24 p>0.05 (NS)
Duration of Labor	9.39±2.03	8.56±2.01	2.90 p<0.05(S)
Birth Weight	2.77±0.42	2.76±0.37	0.17 p>0.05(NS)
Apgar at 1 minute	6.64±1.69	7.27±0.72	t=3.39, p<0.001 (S)
Apgar at 5 minute	8.05±1.39	8.39±0.49	t=2.28, p<0.05 (S)

Aims and Objectives

The present study was aimed to compare the maternal and perinatal outcome in women who had operative vaginal delivery with the women who had normal vaginal delivery.

Material and Methods

This is a prospective study carried out on 200 pregnant women with full term pregnancies admitted in the labor ward of tertiary referral teaching hospital. The patients were divided into 2 groups of 100 each. Group I (Study group) included 100 women delivered by either by outlet forceps (50 women) or by silastic vacuum (50 women). The every patient next to group I, who had normal vaginal delivery and fulfilled the criteria of study, was included in Group II (Control group) and consisted of 100 women.

Selection Criteria were the women having single term fetus (37-42 weeks) with cephalic presentation.

The women with multifetal gestation, diabetes mellitus, irritable bowel syndrome or other bowel or neurological disorders, pre-existing stress incontinence or any other type of urinary incontinence were excluded from the study.

Table II: Maternal complications in study and control groups.

		Group I (%)	Group II (%)	p value	RR (95% CI)
Immediate	Episiotomy extension	19	7	0.01(S)	2.71 (1.19-6.17)
	Cervical tears	10	1	0.01 (S)	10.0 (1.30-76.67)
	Vulval haematomas	5	1	0.01 (S)	5.00 (0.59-42.04)
	Wound infection	3	2	1.0 (NS)	1.50 (0.26-8.79)
At Six weeks	Altered fecal incontinence	10	0	0.01 (S)	-
	Perineal discomfort	42	30	0.07 (NS)	-
	Stress incontinence	3	0	0.24 (NS)	-
	Dyspareunia	23	12	0.40 (S)	1.92 (1.01-3.64)
At three months	Altered fecal incontinence	2	0	0.49 (NS)	-
	Perineal discomfort	14	9	0.26 (NS)	1.56 (0.71-3.43)
	Stress incontinence	2	0	0.49 (NS)	-
	Dyspareunia	13	8	0.24 (NS)	1.63 (0.70-3.75)

Table III: Neonatal complications among study and control groups.

Neonatal complications	Group I	Group II	p value	RR (95% CI)
Apgar < 7 at 1 minute	19%	1%	P=0.00(S)	19.0(2.59-139.23)
Apgar < 7 at 5 minute	5%	0	P=0.05(S)	-
Scalp injuries	18%	0	0.00 (S)	-
Facial injuries	6%	0	-	-
Cephalhaematoma	1%	0	-	-
Need of phototherapy	23%	4%	0.00 (S)	5.75 (2.06-16.03)
Convulsions	13%	3%	0.018 (S)	4.33 (1.27-14.74)
Admission to NICU	32%	7%	0.00 (S)	4.57 (2.12-9.87)

Maternal outcome measures were extension of episiotomy, cervical tears, vulval hematoma, infection, altered fecal or urinary continence, perineal discomfort and dyspareunia. Perinatal outcome measures were Apgar score, injuries to newborn, need of phototherapy, convulsions and admission to neonatal intensive care unit.

Informed consent was taken from all the women. On admission, detailed history regarding age, parity, and obstetrical, menstrual and antenatal history was noted. Labor was monitored carefully for progress of labor and fetal status. Indication for instrumental delivery (Outlet forceps or silastic vacuum cup) was recorded. Episiotomy was given in all the women in both groups. After delivery, all the mothers and babies were observed for 24 hours for any complications like extension of episiotomy, cervical tear and vulval haematoma. If mother and baby were both healthy, they were discharged on second postpartum day. The women were advised to come for follow up after six weeks or earlier if any problems developed. The next follow up was at three months. At follow up visits the mothers were evaluated regarding symptoms of any perineal discomfort, vaginal infection, urinary incontinence, anal incontinence and dyspareunia.

All the data was compiled and analyzed. For all analyses $p<0.05$ was considered statistically significant. The association between the two groups was measured by Relative Risk (RR), with 95% confidence interval.

Results

Results are shown in (table 1-4). The age of the women ranged from 18-35 years. Maximum number of women was nullipara in both the groups being 76% and 67% in-group I and II respectively. The onset of labor was spontaneous in 65% women in study group and 70% women in control group. Indications for operative delivery were fetal distress (52%), to cut short the second stage of labor (19%), prolonged second stage of labor (17%) and inadequate bearing down (12%). There were 19 extensions of episiotomy in study group with 14 extending only to vaginal mucosa, 12 up to midvagina and two-upto fornix. There were ten cervical tears in study group out of which six were single and four were bilateral. The birth weight of babies in the two groups ranged from 2.0 to 3.9 kg with maximum babies having birth weight between 2.5-3.0 kg.

Discussion

In the modern obstetric practice, high, mid cavity and difficult forceps are replaced by cesarean section not only to avoid injuries to the maternal passage but also in favor of better neonatal outcome.

Table IV: Maternal and Neonatal complications in Forceps and Vacuum groups.

Complications		Vacuum N (%)	Forceps N (%)	p value	RR (95% CI)
Maternal complications	Perineal Tears	8(16)	11(22%)	0.44(NS)	0.73 (0.32-1.65)
	Cervical tears	5(10%)	5(10%)	0.73 (NS)	1.00 (0.31-3.24)
	Vulval haematomas	2(4%)	3(6%)	1.00 (NS)	0.67 (0.12-3.82)
	Wound infection	2(4%)	1(2%)	1.0 (NS)	2.00(0.19-1.36)
Neonatal Complications	Apgar <7 at 5 mt	2 (4%)	3(6%)	1.00(NS)	0.67 (0.12-3.82)
	Scalp injuries	7(14%)	11(22%)	0.10 (NS)	0.56 (0.27-1.15)
	Facial injuries	1(2%)	5(10%)		
	Cephalhae matoma	1%	0		
	Phototherapy	16(32%)	7 (14%)	0.03 (S)	2.29(1.03-5.07)
	Convulsions	14(8%)	9(18%)	0.23 (NS)	0.44 (0.15-1.35)
	Admission to NICU	17(34%)	15(30%)	0.66 (NS)	1.13(0.64-2.01)

Vacuum and outlet forceps still remain very useful procedures for the really critical second stage of labor if applied judiciously. None of the studies on operative vaginal delivery published since 1980 have documented an increased risk of perinatal mortality, in sharp contrast to older work and even maternal morbidity is acceptably low.

In present study, on comparing the baseline characteristics, the mean maternal age in our study (Table-1) was comparable with study by Carmona et al [5] the mean age was 23.5 years in the forceps delivered patients and 23.7 years in the normal delivery group. The mean gestational age at the time of delivery in our study was 39.42 weeks in the study group and 39.46 weeks in control group (Table-1) Carmona et al [5] reported same mean gestational age of 40.1 weeks in both forceps and normal delivery groups. In our study, the mean parity was 0.29 in study group and 0.35 in control group (Table-1). In the study by Fitzpatrick et al [6] and Carmona et al [5]. All the patients were nulliparous. In contrast to the present study, where the most common indication for operative delivery were fetal distress (52%), Bofill et al [7]. reported maternal exhaustion in 28.6% as the commonest indication and fetal distress accounted for 20.2% cases. Patel et al8 in a retrospective analysis found that the two common indications for operative intervention were fetal distress (43.0% and 44.39% in vacuum and forceps groups respectively) and prolonged 2nd stage (20.66% and 19.51% respectively), which are similar to the present study.

In present study, episiotomies were given to all the women in both the groups and there were no vaginal tears other than extensions of the episiotomy. There were 19% and 7% extension of episiotomy in-group I and II respectively (Table-2). Similar to the present study, Carmona et al [5]. performed episiotomies in all cases but reported no significant perineal laceration in any of them. Patel et al8 studied forceps and vacuum separately and found 23.17% extension of episiotomy in the forceps, 7.7% in vacuum and 0.8% in control groups. Fitzpatrick et al [6]. Reported third degree tears occurring in 11.52% of operative delivery. In the study by Bofill et al [7]. 28.88% had perineal tears in operative delivery, which is higher than the present study (Table-2).

In study by Patel et al [8]. Cervical tears were seen in 10.5% women in forceps group and 7.8% women in vacuum group and no tear in control group, which is almost comparable to our study 10%, (Table-2). In our study, 3% women in study and 2% women in control group had wound infection (Table -2). On comparing the report of Patel et al [8]. wound gaping was seen in 3.8%, 8.5% and 4% women in vacuum, forceps and normal delivery groups respectively.

The mean birth weight of babies in our study and control group was 2.77 kg and 2.76 kg respectively (Table 1). In studies by Fitzpatrick et al [6]. Bofill et al7 and Carmona et al5, the mean birth weights were much higher being 3.45 kg vs 3.65 kg, 3.1 kg vs 3.08 kg and 3.45 kg vs 3.3 kg respectively in the vacuum and forceps groups. The reason may be that in our country most of the babies are having lower birth weight than the western countries.

In our study the mean Apgar score at one minute was significantly low in the study group compared to the controls (p=0.00), (Table-1). This difference may not be related to the mode of delivery but may be due to the operative intervention being done for primary fetal distress in majority of the patients in study group. The Apgar score <seven at five minutes was observed in 5% babies in study group in present study (Table-3) which is almost comparable with study of Fitzpatrick et al6 who reported 7% and 4% babies in forceps and vacuum groups respectively. Patel et al.8 reported Apgar score less than seven at five minute in 4.3% and 3.9% babies in forceps and vacuum groups respectively. In the present study, scalp injuries, facial injuries and cephalhaematoma were noted in 18%, 6%, and 1% respectively (Table -3) which is lower than reported by Patel et al8 - scalp injuries in 16.5% and 10.9% babies in vacuum and forceps groups respectively and cephalhaematomata in 4.85% and 1.46% babies in vacuum and forceps groups respectively. There were facial marks in 25.8% babies in forceps group and none in babies delivered by vacuum. As far as admission to NICU is concerned, in the present study 32% babies were admitted to NICU in study group as compared to 7% in control group, while Carmona et al [5] reported 8% admission in operative group and 4% in normal delivery.

On follow up at 3 months in our study, 2% women each in study group had altered urinary and fecal continence (Table-2). Liebling et al [9]. studied pelvic floor morbidity after difficult instrumental delivery and reported a higher incidence of urinary incontinence (16.2%) and altered fecal continence (32.3%). This high incidence may be due the fact that he took difficult instrumental deliveries into account. Fitzpatrick et al6 also reported altered fecal continence in very high percentage of 33.3% vs 59% women in vacuum vs forceps groups [p=0.00, RR 2.88 (95% CI 1.41-5.88)]. Sultan et al [10]. studied 43 women with a median time between delivery and assessment of 163 (range 44-1265) days and reported fecal incontinence in 6%, 4% and 2% women in vacuum, forceps and control groups respectively. At three months perineal discomfort was reported by 14% women in study group, comparatively higher rates were reported by Fitzpatrick et al 27.5% in vacuum group and 32.7% in forceps group [RR 1.28 (95% CI 0.61-2.72)] [6].

In the present study there was no significant difference in perineal tears, cervical tears vulval hematoma, infection, Apgar score at 5 minutes and neonatal injuries in vacuum and forceps group (Table-4). As per Cochrane systematic review of ten randomized controlled trials, involving 2923 women, vacuum extraction compared with forceps is more likely to be associated with cephalhaematoma (OR 2.4; 95% CI 1.7–3.4) and less likely to be associated with significant maternal perineal and vaginal trauma (OR 0.4; 95% CI 0.3–0.5) [11]. This is similar to present study though the perineal tears are

not significantly high in present study and this may be due to small sample size.

Conclusion

Operative delivery appears to cause more complications in both mothers and babies compared to normal delivery, but all these complications are minor in nature. So, instrumentation in the second stage of labor remains useful procedures if applied judiciously and forceps and vacuum extraction has no difference in perinatal and maternal outcome.

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