



COMPARISON OF NEONATAL OUTCOME IN PATIENTS WITH AND WITHOUT EPISIOTOMY IN VACUUM ASSISTED DELIVERY

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ABSTRACT **Background:** Instrumental delivery is among the most common obstetric techniques, with vacuum extraction (VE) being the procedure of choice. Episiotomy is a surgically planned incision at the time of vaginal childbirth, given to minimize perineal tears and neonatal morbidity. **Objectives:** To compare the neonatal complications with or without episiotomy in vacuum assisted vaginal delivery. **Material and methods:** This interventional study was carried out in the department of obstetrics and Gynaecology, SRN Hospital, Moti Lal Nehru Medical College and Kamla Nehru Memorial Hospital, Prayagraj from August 2021 to August 2022. **Result:** We concluded that the liberal use of episiotomy to prevent neonatal complications in vacuum assisted delivery is warranted.

KEYWORDS :

INTRODUCTION

Operative vaginal delivery (OVDs) refers to the use of forceps or a vacuum device to help the woman deliver the foetus vaginally.^[1] There are a variety of reasons to perform an OVDs, including a prolonged second stage of labour or concern regarding the health of the mother or the newborn.^[2] After applying one or the other on the foetal head, outward traction creates forces that support maternal pushing during vaginal delivery.

Instrumental or aided vaginal delivery is frequently utilized to hasten birth for the benefit of either the mother or the infant, or both.

Instrumental delivery is among the most common obstetric techniques, with vacuum extraction (VE) being the instrument of choice since it is simple to use, requires less anesthesia/analgesia, has a lower rate of maternal morbidity, and is often regarded as safe.

Dr. James Yonge, an English surgeon, initially proposed the idea of facilitating birth by applying suction on the head of the foetus in 1705.

During vacuum-assisted vaginal birth, a vacuum is created between the vacuum suction cup and the foetal scalp. This technique is known as vacuum extraction (VE), in which a soft or rigid suction cup grips the baby's head and facilitates delivery.^[3] VE is strongly reliant on the traction caused by the pressure difference between the atmosphere and the suction cup, as well as the pressure caused by maternal contractions. This accumulating pressure aids the child's passage through the birth canal.^[3] Vacuum extraction is an evidence based, lifesaving, and generally safe operation that is not always utilized when required. It can prevent a lengthy second stage of labour. There are several varieties of vacuum extractors, but there are two primary categories: soft cup and metal cup ventouse. However, it was shown that soft vacuum cups had a reduced incidence of scalp injuries, but a greater failure rate. Significant foetal morbidity can result from vacuum-assisted vaginal births, such as scalp lacerations, cephalohematomas, subgaleal hematomas, cerebral haemorrhage, facial nerve palsies, hyperbilirubinemia, and retinal haemorrhage.

AIMS AND OBJECTIVES:

1. To compare the neonatal complications with or without episiotomy in vacuum assisted vaginal delivery

MATERIAL AND METHODS:

Place of Study: Swaroop Rani Nehru hospital and Kamla Nehru hospital, department of obstetrics and gynaecology, Motilal Nehru Medical College, Prayagraj.

Duration of Study: 1 year

Type of Study: Interventional study

Sample Size : 140 women in labour

Inclusion Criteria:

- 1) Patient willing for vacuum assisted delivery
- 2) Singleton pregnancy
- 3) Gestational age > 37 weeks
- 4) Vertex presentation
- 5) Prolonged second stage of labour.
- 6) Elective shortening of the second stage of labor
- 7) Maternal exhaustion

Exclusion Criteria:

- 1) Cephalopelvic disproportion
- 2) Foetal malpresentation (e.g., breech, transverse lie, brow, face)
- 3) Dilatation of cervix < 4cm
- 4) Intact foetal membranes
- 5) Unengaged vertex
- 6) Underlying foetal disorders (foetal bleeding disorders & foetal demineralising diseases)
- 7) Estimated gestational age < 34 weeks or estimated foetal weight < 2500g
- 8) Immunocompromised patients (HIV, HbsAg reactive, uncontrolled diabetes mellitus patients).

OBSERVATIONS:

TABLE 1 - Age, Education and Dwelling wise distribution of case and controls in the study

AGE (IN YEARS)	WITH EPISIOTOMY [n=70]		WITHOUT EPISIOTOMY [n=70]		P-VALUE
	N	%	N	%	
≤25 years	27	38.57%	21	30.00%	p=0.1949
26-30 years	22	31.43%	33	47.14%	
>30 years	21	30.00%	16	22.86%	
MEAN±SD	25.91	3.89	27.11	3.75	T=1.858 P=0.0653
EDUCATION	N	%	N	%	p=0.4657
Illiterate	16	22.86%	14	20.00%	
High School	24	34.29%	22	31.43%	
Intermediate	25	35.71%	23	32.86%	
Graduated	5	7.14%	11	15.71%	p=0.6103
DWELLING	N	%	N	%	
Rural	30	42.86%	33	47.14%	
Urban	40	57.14%	37	52.86%	

TABLE 2- Gestational age of women enrolled in case and control groups

Gestational Age	With Episiotomy [N=70]		Without Episiotomy [N=70]		P-Value
	N	%	N	%	
<38 Weeks	24	34.29%	37	52.86%	P=0.05340
>38 Weeks	46	65.71%	33	47.14%	

TABLE - 3 Labour and delivery factors of women enrolled in case and control groups

		With Episiotomy [N=70]		Without Episiotomy [N=70]		P- Value
		Mean/N	Sd/%	Mean/N	Sd/%	
Pressure		505.71	77.25	522.14	70.53	T=2.208 P=0.0289
Station	0	14	20.00%	6	8.57%	P=0.0911
	+1	16	22.86%	18	25.71%	
	+2	40	57.14%	46	65.71%	
Cervical Dilatation	<8	4	5.71%	9	12.86%	P=0.1454
	≥8	66	94.29%	61	87.14%	

TABLE 4 - Weight of neonates born to women enrolled in study and control groups

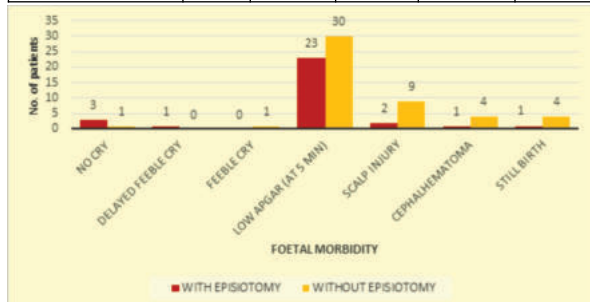
Foetal Weight	With Episiotomy [N=70]		Without Episiotomy [N=70]		P- Value
	N	%	N	%	
<2.5 Kg	8	11.43%	8	11.43%	1
2.5-3 Kg	45	64.28%	47	67.14%	
>3 Kg	17	24.29%	15	21.4%	

Table 5- APGAR score of neonates born to women enrolled in case and control groups

Apgar Score		With Episiotomy [N=70]		Without Episiotomy [N=70]		P-Value 0.2809
		N	%	N	%	
1 Min	<7	27	38.57%	36	51.14%	
	≥7	43	61.42%	34	48.57%	
5 Min	<7	23	32.86%	30	42.86%	
	≥7	47	67.14%	40	57.14%	

TABLE 6 - Morbidity in neonates born to women enrolled in study and control groups

Foetal Morbidity	With Episiotomy [N=70]		Without Episiotomy [N=70]		P-Value
	N	%	N	%	
No Cry	3	4.29%	1	1.43%	0.3103
Delayed Feeble Cry	1	1.43%	0	0.00%	0.3156
Feeble Cry	0	0.00%	1	1.43%	0.3156
Low Apgar (At 5 Min)	23	32.86%	30	42.86%	0.2226
Scalp Injury	1	2.86%	3	12.86%	0.3103
Cephalhematoma	1	1.43%	4	5.71%	0.1719
Still Birth	1	1.43%	4	5.71%	0.1719
Grand Total	31/70	44.29%	49/70	70.00%	

**DISCUSSION:****Table 1: Age**

In our study, the majority of women in the group with episiotomy were less than 25 years of age, whereas the majority of women in the group without episiotomy were between 26 and 30 years of age.

The mean age of study group and control group were 25.91 years and 27.11 years respectively with statistically non-significant difference (P value >0.05). The kind of distribution is because, in our society the

trend of marriage and childbearing usually gets completed at 21-34 years of age. Similar to our study **Soleimanzadeh et al., 2020^[4]** had shown that the average age of women who had an episiotomy was much younger than that of those who did not. **Aguiar B. et al., 2020^[5]** reached the identical finding.

Education Status

Based on the education status the study and control groups were divided into illiterate and literate. Majority of the patients in study group and control group were literate i.e., 77.14% and 80% respectively. This again showed the trend of patients attending the hospital for delivery. Literate populations are aware of the benefits of institutional delivery; hence they attend the hospital for antenatal checkups as well as for delivery.

We also observed statistically non-significant difference in the education status in different groups.

Rasouli et al., 2016^[6] found a correlation between the episiotomy and the mother's level of education (more often among women with higher education) The study by **Graz yna Ba czek et al., 2022^[7]**, revealed no link between episiotomy and women's education and marital status.

Residence

In our study, most of the patients in both study [40(57.14%)] and control groups [37(52.86%)] belonged to urban areas, followed by those who belonged to rural areas, and this difference was not significant (P value >0.05). This showed the trend of majority of population visiting the hospital for delivery. As India has maximum population of rural areas, and they have less access to the health care facility due to lack of knowledge transport facility and better peripheral health care infrastructure better government schemes, most of the rural population visit at nearby health centers and only complicated cases are referred to our center. Our hospital is located in urban area, so maximum population visiting our hospital is from urban population. We observed non-significant difference in different study groups thus the effect of dwelling on result nullifies. **Rasouli et al., 2016^[6]** also could not find a correlation between this medical procedure and the mother's residency.

Table 2: Gestational Age

In our study the majority of the women in the study group had a gestational age of >38 weeks [46(65.71%)], while in the control group, the gestational age was recorded as <38 weeks [37(52.86%)], and this difference in gestational age of women was insignificant (P value >0.05). Non-significant difference in gestational age distribution in different study groups nullifies the effect of gestational age on perineal tear.

Paulina Aukee et al 2006 analyzed that third-degree anal sphincter tears were significantly associated with gestational age over 42 weeks, primiparity, prolonged duration of the second stage (over 2 hours), birth weight over 4,000 g, and parietal presentation.

Table 3: Labour And Delivery Factors Of Women Enrolled In Study And Control Groups

The fetal head station was noted as +2 in most of the women in both groups, and the cervical dilation was ≥8 in most of the women in both cases [66(94.29%)] and controls [61(87.14%)]. Statistically, a non-significant difference was observed in labour and delivery factors. **Hirokyu Sekia and Satoru Takedab(2016)** Observed that prohibition of high forceps delivery in Japan, and the present rarity of mid forceps deliveries in the US, the appropriate position of the fetal head for vacuum extraction ought to be station +2 or lower in accordance with the appropriate fetal head position for forceps delivery used in the University of Tokyo method, and not station ± 0 as is often currently performed. Furthermore, considering the weaker pulling power of vacuum extraction compared to forceps delivery, it would be theoretically justified to recommend a lower fetal head height for vacuum extraction than for forceps delivery.

Broekhuizen FF et al 1987^[8] Preapplication station also differed, with 59.8% of vacuum extraction at +1 or higher stations, compared with 9% of forceps.

Table 4: Weight Of Neonates Born To Women Enrolled In Study And Control Groups

The majority of the neonates in study [45(64.28%)] and control groups [47(67.14%)] weighed 2.5-3kg, followed by > 3 kg, and this

difference was not statistically significant. **Hanoch Schreiber et al., 2020^[9]**. Observed that episiotomy was related with greater rates of maternal blood loss, higher fetal birthweight, and malposition. **Grazyna Baczek et al., 2022^[10]** showed that among women giving delivery with an episiotomy, the birth weight of the infant and the circumference of the head were bigger, and the state of the newborn after birth was more frequently evaluated as seven (7) on the Apgar scale in 1' and 3' minutes. **Vasileios Pergialiotis 2014^[11]** observed that women with severe perineal tears were more likely to have had heavier infants, or episiotomy or an operative vaginal delivery.

Table 5: Apgar Score Of Neonates Born To Women Enrolled In CaseAnd Control Groups

Majority of the neonates had an APGAR score >7 in study group [43(61.42%)] and < 7 in control group [36(51.14%)] at 1 minute. Similarly, most of the neonates in the study [47(67.14%)] and control group [40(57.17%)] had higher APGAR scores, i.e., ≥ 7 at 5 mins. **Soleimanzadeh et al., 2020^[12]** observed that the newborn's APGAR score in the first and fifth minutes of life was considerably lower in the group of mothers who received an episiotomy. **Rasouli et al., 2016^[13]** made similar findings and observed a strong link between episiotomy and a poorer Apgar score in the newborn's first minute of life and a greater head circumference.

C. Gardella et al^[14] study showed that, spontaneous vaginal deliveries and deliveries by sequential use of vacuum and forceps had significantly higher rates of depressed 5-minute Apgar score (RR, 3.0; 95% CI, 2.2 to 4.0) and assisted ventilation (RR, 4.8; 95% CI, 2.1 to 11.0). **Renad A Abbas et.al^[15]** showed that, the first-minute Apgar score was lower with VE ($p < 0.001$).

Table 6: Morbidity In Neonates Born To Women Enrolled In Study And Control Groups

In our study majority of the neonates had low APGAR scores, which was not a good sign, followed by no cry in the study group [3(4.29%)] and scalp injury in the control group. Statistically, a non-significant difference was observed in the morbidity of neonates except for scalp injury. **Katarina Åberg 2014^[16]** observed that neonatal complications after VE are generally low, higher odds ratios for intra- and extracranial hemorrhages and brachial plexus injuries after VE, compared with other modes of delivery, support a continued cautious use of VE for preterm delivery. **Cecilia Ekéus et al 2014^[17]** observed that vacuum assisted delivery is associated with increased risk for neonatal intracranial hemorrhages. **Ana Ferraz et al 2019^[18]** concluded that proportion of minor neonatal complications was higher in the vacuum-assisted delivery group. Although major complications and death were also more frequent, they were uncommon, with no significant differences compared to the other groups.

CONCLUSION:

The evidence based on the corresponding results of the interventional study concluded that there is no significant difference in neonatal morbidity with or without episiotomy in vacuum assisted delivery. So, we concluded that the liberal use of episiotomy to prevent neonatal complications in vacuum assisted delivery is warranted.

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