MEDICAL CHANNEL

Original Article

FETAL OUTCOME OF VACUUM VAGINAL DELIVERY

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ABSTRACT:

Introduction: Normal vaginal delivery during spontaneous labor does not work under certain circumstances, and instrumental assistance may be attempted to avoid operative delivery which may shortly affect the fetal outcome.
Objectives: To determine the fetal outcome in vacuum vaginal delivery at Obstetric Unit III, Civil Hospital, Karachi
Setting: A case series study was conducted in Obstetric Unit III, Civil Hospital, Karachi and the duration of the study was 6 months, in which 113 patients were included. A non probability sampling was done.
Material and Methods: Women delivered with the help of vacuum, meeting the inclusion criteria were included in the study. The criteria was delivery at or more than 37 completed weeks of gestation, patients with non-reassuring fetal heart rate patterns and patients failing to push at full dilation of cervix despite good contractions. Apgar scores, weight, caput succedaneum, cephalhaematoma and neonatal jaundice were seen as fetal outcome. Low apgar score was taken as less than d"6, low birth weight as <2.5kg, jaundice as serum bilirubin >5mg/dl at birth, cephalhaematoma when localized collection of blood over scalp not crossing suture lines and caput succedaneum when swelling of the presenting part crossing the suture lines both (diagnosed clinically) within 24 hrs after delivery. The babies were followed till their stay in the nursery. All the details were noted down in attached proforma. Data were analyzed by using SPSS 10.0.
Results: Mean age was 26.03±4.40. Most of the women were para 1-4 (48.67%). Majority of the women undergoing vacuum assisted delivery had gestational age of 37-40 weeks i.e. 59.3%. Poor apgar score at one minute was encountered only in 0.9%, low birth weight 1.8%, cephalhematoma 2.7%, caputsuccedaneum 3.5% and neonatal jaundice 0.9%.
Conclusion: Vacuum extractor offers an immediate benefit of reducing several maternal injuries and very low fetal risk if it is performed by expert hands.

Keywords: Vacuum Extraction, Fetal Outcome, Neonatal Complications

INTRODUCTION

When spontaneous vaginal delivery is difficult, instrumental delivery may be attempted. The use of instruments to facilitate delivery dates centuries back. Hildanns first reported the use of vacuum. Multiple innovations followed, and finally in 1953, Malstorm of Sweden described the successful vacuum extractor, now in use with various modifications[1].

On the basis of low risk to mother and baby, the Royal College of Obstetricians and Gynaecologists recommends vacuum as the instrument of first choice for assisted vaginal delivery[2].

There are two general categories of vacuum cup: the rigid, mushroom-shaped cups patterned after the original malstorm cup; and the soft, bell or trumpet –shaped cups. The soft cups were considered causing less fetal and maternal trauma, but the follow-up studies comparing the two types of cup showed that the soft cups may reduce the

number of transient or superficial scalp effects but there were no differences in apgar scores or neurological outcomes[3] Nine trials involving 1375 women were included. The trials were of average quality. Soft cups are significantly more likely to fail to achieve vaginal delivery (odds ratio 1.65, 95% confidence interval 1.19 to 2.29). However, they were associated with less scalp injury (odds ratio 0.45, 95% confidence interval 0.15 to 0.60). There was no difference between the two groups in terms of maternal injury[4]

In a study at komfo anokye teaching hospital, apgar score were 0-3 at 1 min in 3.1% and 0.7% at 5 min, 4-6 at 1 min in 16.4% and 7.2% at 5 min, 7-10 at 1 min in 80.5% and 92.1% at 5 min. The percentages of the babies delivered by vacuum were 26.3% between 2.6-3.0 kg, 32.8% between 3.1-3.5 kg and 12.9% between 3.6 – 4.0 kg[5]

Failure to time traction effort carefully leading to cup detachment predispose to injury. Fetal complications can be reduced by using the instrument with caution and by the delivery supervised by trained personnel[6]

The purpose of this study was to determine the fetal morbidity and mortality associated with vacuum vaginal delivery.

MATERIAL AND METHODS

A case series study was conducted in Civil Hospital, Karachi, for six months, in which 113 patients were included and non-probability sampling was done. The inclusion criteria for the study was delivery at or more than 37 weeks of completed gestation; patients with non-reassuring fetal heart rate pattern; and patients failing to push at full dilatation of cervix despite good contractions. Exclusion criteria was fetal anomalies diagnosed on scan; non cephalic presentation; and occipito transverse position and multiple gestation.

The study was conducted in Obstetric Unit-II of Civil Hospital Karachi. Women delivered with the help of vacuum meeting the inclusion criteria were included in the study. The purpose and procedure of the study were explained to the patients and informed consent was taken by the resident. Apgar scores, weight, caput succedaneum, cephalhaematoma and neonatal jaundice were seen as fetal outcome. The babies were followed till their stay as all vacuum deliveries were observed in the nursery for 24 hours. All the details were noted down in attached proforma.

All the data was analyzed on SPSS version 10.0. Frequencies and percentages were calculated for qualitative variables like cephalhaematoma, caput succedaneum and neonatal jaundice. Mean ± SD was calculated for quantitative variables like maternal age. Stratification was done with regard to maternal age, parity and gestational age to see the effect of these variables on fetal outcome.

RESULTS:

Out of 113 women who were delivered with vacuum, their mean age was 26.03 ± 4.40 (ranging from 18 to 35) years. The most common age group was 26-30 years in which there were 43 (38.05%) women.

Most of the women were para 1-4 (48.67%). Out of which majority were primiparous.

Majority of the women undergoing vacuum assisted delivery had gestational age of 37 weeks up to 40 weeks. The majority were around 37 days.

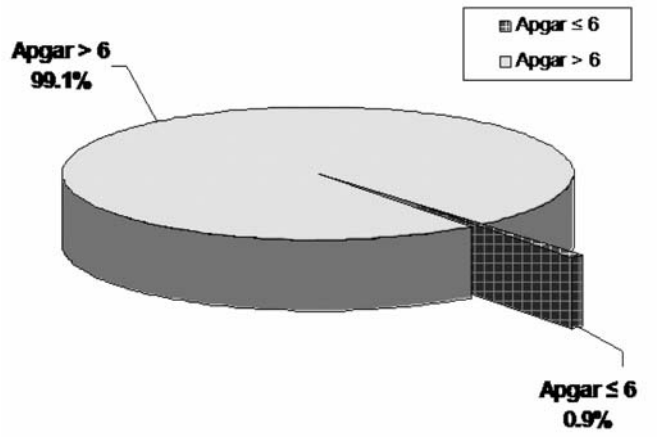
Low apgar score at 1 minute was observed in only one (0.9%) neonate while 99.1% had normal apgar score (>6). None of the case was observed with low apgar score (d”6) at five minutes after birth.

Among 113 live births, 2 (1.8%) were found with low birth weight (<2.5 kg) while 98.2% had normal birth weight (2.5 kg). Cephalhematoma was found in three neonates (2.7%). Caput succedaneum was seen in 4 (3.5%) neonates. Jaundice occurred in one (0.9%) neonate.

One neonate with low apgar score was seen in the maternal age group of 31-35 years. Of 14 mothers with age d” 20 years, one (7.14%) neonate with low birth weight and of 34 mothers with age 21-25 years had one (2.94%) low birth weight baby. Out of three cephalhaematoma cases, 2 were found in the age group 31-35 years. The four cases of caput suceedaneum were seen as one case in each age group. One baby with jaundice was observed in the age group 26-30 years.

One and only baby with low apgar score was of primiparous mother. Out of two babies with low birth weight, one was of primiparous and other of grand multiparous mother.

NEONATAL APGAR SCORE AT ONE MINUTE:
n = 113



FETAL OUTCOME ACCORDING TO GESTATIONAL AGE:

Fetal outcomes	Gestational age (weeks)			
	37 wks (n=48)	38 wks (n=34)	39 wks (n=23)	40 wks (n=8)
Low apgar score	1 (2.08)	0 (0)	0 (0)	0 (0)
Low birth weight (kg)	1 (2.08)	1 (2.63)	0 (0)	0 (0)
Cephalhaematoma	1 (2.08)	0 (0)	1 (4.35)	1 (12.5)
Caput suceedaneum	1 (2.08)	1 (2.63)	1 (4.35)	1 (12.5)
Jaundice	0 (0)	0 (0)	1 (4.35)	0 (0)

Key: Values given in parentheses are percentages
Wks: Weeks

One baby with low birth weight was seen in the gestational age 37 weeks and one in 38 weeks. Caput suceedaneum was seen in every gestational age group except 38 weeks' gestation. Cephalhaematoma was seen as one each among the gestational age groups of the study. The only one baby with jaundice was seen in the gestational age group of 39 weeks.

DISCUSSION

Vacuum extractors have replaced forceps for many situations in which assistance is required to achieve vaginal delivery. Compared with metal-cup vacuum extractors, soft-cup devices are easier to use and cause fewer neonatal scalp injuries; however, they detach more frequently. Vacuum extractors can cause neonatal injury. These devices should be employed when indicated, usually for a no reassuring fetal heart tracing or failure to progress in the second stage of labor. Complications may be minimized if the physician recognizes contraindications to the use of vacuum extraction. Complete documentation is essential.[7]

Instrumental vaginal delivery is an important procedure to accomplish delivery quickly and safely.

Principal finding of the study regarding the fetal outcome of mothers undergoing vacuum assisted delivery has shown that poor apgar score at one minute was encountered only in 0.9%, low birth weight 1.8%, cephalhematoma 2.7%, caputsuccedaneum 3.5% and neonatal jaundice 0.9% that seems inconsistent with the statement that although vacuum assisted delivery may be attempted to avoid caesarian section but it may shortly affect the fetal outcome. [8]

Regarding fetal damage Dell reported Cephalhaematomas in 13.9% of vacuum group as compared to 2.2% of babies in the forceps group [9] .Johanson et al[10] found Cephalhaematomas in 9% of the vacuum group and 3% of the forceps group. However on comparing the two i.e. obstetric forceps and vacuum it has been seen that despite evidence in favour of the vacuum extractor obstetrician in many countries continue to prefer forceps[11] Although the prime reason for this is likely to be the tradition in training Other reason given for not using vacuum extractor includes staff inexperience and technical difficulties like inability to maintain a vacuum and the presence of leaks in the tubing[12]

In a comparative study, vacuum delivery increases the rates of neonatal cephalohematoma (OR = 2.38; 95% CI, 1.68 to 3.37) and retinal hemorrhage (OR = 1.99; 95% CI, 1.35 to 2.96) compared with forceps delivery[13] Hemorrhages typically resolve without sequelae within four weeks of birth, but cephalohematoma can lead to hyperbilirubinemia. One study showed no differences in vision problems or in child development five years after vacuum or forceps delivery.[14]

Vacuum-assisted vaginal deliveries can cause significant fetal morbidity, including scalp lacerations, cephalohematomas, subgaleal hematomas, intracranial hemorrhage, facial nerve palsies, hyperbilirubinemia, and retinal hemorrhage. The risk of such complications is estimated at around 5%.[15] The incidence of subgaleal hematomas after vacuum-assisted vaginal delivery ranges from 26 to 45 per 1000 deliveries.[16] a cross-sectional study evaluating the incidence of neonatal retinal hemorrhage found that the incidence was higher for vacuum-assisted vaginal deliveries (75%) compared with spontaneous vaginal (33%) and cesarean deliveries (7%).[17]

Pediatricians should be notified whenever an operative vaginal delivery has been attempted and whether it was successful because serious morbidity can present several hours after birth. For this reason, such neonates should be closely observed. A large prospective, observational, cohort study conducted in the Netherlands found that all vacuum-related injuries in term neonates were evident within 10 hours of birth. The authors concluded that neonates may be discharged 10 or more hours after vacuum delivery if no complications are evident.[18]

CONCLUSION:

Vacuum assisted delivery is a good alternative to forceps when used correctly. Axis traction in line with the maternal pelvis is also of the utmost importance and should be stressed when training new physicians. Finally, being willing to abandon the procedure if one of the noted limits is reached, should also serve as a safety measure. If these guidelines are implemented, the success rate of vacuum delivery should increase, the complications decrease, and the litigation associates with assisted deliveries should also decrease.

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