

Instrumental Vaginal Deliveries at the University of Maiduguri Teaching Hospital

Abdulkarim G. Mairiga, Othman Kyari and Bala M. Audu.

Department of Obstetrics and Gynaecology, University of Maiduguri Teaching Hospital, Maiduguri, Nigeria.

Abstract

Context: Appropriate anaesthesia, efficient blood transfusion services, efficacious antibiotics and qualified personnel are not readily available for safe caesarean section in most developing countries. There is therefore, the need to promote the practice of instrumental vaginal delivery. Consequently, this review is intended to awaken interest in the practice of instrumental delivery.

Objectives of the Study: To determine the extent of use and complications associated with the use of obstetric forceps and ventouse in a teaching hospital.

Setting and Subjects: All cases of instrumental deliveries (obstetric forceps and vacuum extraction) at the University of Maiduguri Teaching Hospital, Maiduguri, between 1st of January 1993 and 31st of December 2000 were reviewed.

Results: Out of a total of 10,881 deliveries recorded, 181 (1.67%) were by vacuum extraction and 33 (0.30%) were by forceps. The common indications for forceps deliveries and vacuum extraction were delay in the second stage of labour and medical conditions, including pre-eclampsia, eclampsia and cardiac disease. The main maternal complications were lacerations of the genital tract. One maternal death was recorded. The most frequent fetal complication was birth asphyxia. Fresh stillbirth was found in 7 (2.21 per cent) of vacuum extraction, and 2 (6.06 per cent) of forceps deliveries. Other foetal complications noted were cephalhaematoma and intracranial haemorrhage.

Conclusions: Training of resident doctors and other medical staff in charge of deliveries and the use of less traumatic devices are essential in the effort to promote the correct use of the instrument and the avoidance of complications.

Key Words: Vacuum, Forceps, And Instrumental Vaginal Delivery. [Trop J Obstet Gynaecol, 2005, 22: 42-45]

Introduction

When spontaneous vaginal delivery is delayed or may compromise mother/foetus or both, instrumental delivery may be attempted. In 1705, Yonge described an attempted vaginal delivery using a cupping glass. In 1848, the developer of the Simpson forceps devised a bell-shaped device called an "air tractor vacuum extractor." Multiple innovations followed, and Malmström developed a metal-cup extractor in 1953. More recently, bell-shaped and hemispheric silicone rubber cups have come into use.¹

In Europe, the vacuum extractor has long been the instrument of choice for assisted vaginal delivery. In the United States, the forceps has been preferred, although the vacuum extractor is becoming increasingly popular.²

The advantages and disadvantages of vacuum extractors and forceps are well documented.³⁻⁸ A recent Cochrane review⁴ found that the risks and benefits of the two forms of assisted delivery are comparable. Often, the delivery instrument is selected based on the training and experience of the individual physician as well as the indication for the procedure. Deficient knowledge and incorrect technique contribute to increased complications of instrumental vaginal delivery. Practitioners should be aware of potential risks and of necessary safety measures.

Appropriate anaesthesia, efficient blood transfusion services, efficacious antibiotics and qualified personnel

are not readily available for safe caesarean section in most developing countries. There is therefore, the need to promote the practice of instrumental delivery. Consequently, this review is intended to awaken interest in the practice of instrumental delivery. Its objectives are to determine the extent of use of the obstetrics forceps and ventous; indications and complications associated with those procedures.

The objectives of this review are to determine the extent of the use of the obstetrics forceps and ventous in our community and to determine indications and complications associated with those procedures.

Materials and Methods

All cases of instrumental vaginal deliveries (Obstetric forceps and vacuum extraction) at the University of Maiduguri Teaching Hospital, Maiduguri, from 1st of January 1993 to 31st of December 2000 were reviewed. Data were obtained from the patients' case notes, labour ward records, and neonatal ward record. In addition to the socio-demographic characteristic of the patients, the indications for instrumental delivery, complications of the procedure and foetal outcome were examined.

Correspondence: Dr. A. G. Mairiga, Department of Obstetrics and Gynaecology, University of Maiduguri Teaching Hospital, Maiduguri, P. M. B. 1414, Maiduguri, Nigeria.
E-Mail: dragmairiga@yahoo.com

Registrars, Senior Registrars and Consultant in the Department of Obstetrics and Gynaecology undertook the instrumental deliveries. The Wrigley's forceps and the vacuum extractor were the instruments used to facilitate vaginal deliveries during the period under review. All data were expressed as absolute values and percentages. Statistical calculations were done using EPI info 2002 version. Chi Square was used to examine the significant association between variables. Statistical Significance was set at level of 0.05.

Table 1
Age and Parity Distribution

Factors	Vacuum Extraction	Forceps Delivery	Total
Age			
15 - 19	69	12	81
20 - 24	47	9	56
25 - 29	13	2	15
30 - 34	38	7	45
35 - 40	14	3	17
Total	181	33	214
	$\chi^2 = 0.16, df = 4$	$p = 0.997$	
Parity			
0	75	18	93
1 - 4	78	10	88
≥ 5	28	5	33
Total	181	33	214
	$\chi^2 = 2.22, df = 2$	$p = 0.330$	

Results

During the eight years period of the study, 10,881 patients were delivered. Vacuum extraction and forceps deliveries constituted 181 and 33 cases respectively. An overall instrumental vaginal delivery rate was 2.0 percent. The incidence of the instrumental deliveries were 1:60 deliveries (1.67%) for vacuum and 1:33 deliveries (0.30%) for forceps deliveries, success rates were 90.2 percent and 97 per cent for vacuum extraction and forceps deliveries respectively. In either case, the failed procedures were terminated by emergency caesarean section.

The patients' age ranged from 15 - 40 years, with a mean of $18.5 \pm 4.4SD$ years among those delivered by forceps and $23.8 \pm 1.3SD$ years for those who were delivered by vacuum extraction. However there is no significant statistical difference between the cases in respect to their ages ($\chi^2 = 0.16, df = 4, p = 0.997$). The parity of patients ranged from 0-7 with a mean of 4. Seventy-five cases (41.4%) of vacuum extraction and 18(54.6%) of forceps deliveries were to primigravidae (table 2).

Table 2: Indications for the Procedures

Indication	Vacuum Extraction	Forceps Delivery
Maternal		
Delayed second stage	75 (41.40%)	10 (30.30%)
PIH-Including Pre-eclampsia	25 (13.80%)	9 (27.27%)
Poor maternal effect	36 (19.90%)	7 (21.21%)
Eclampsia	5 (2.80%)	4 (12.13%)
Cardiac Disease	2 (1.10%)	1 (3.03%)
Foetal		
Foetal distress	15 (8.30%)	2 (6.06%)
Malposition	14 (7.70%)	0
Cord Prolapse	7 (3.90%)	0
Prematurity	2 (1.10%)	0
Total	181 (100%)	33 (100%)

$$\chi^2 = 15, df = 8, p = 0.06$$

Delay in second stage constituted the most frequent indication and occurred in 41.4 % of vacuum extraction and 30.3 % of forceps deliveries (Table 3). Lacerations in the lower genital tract were the commonest maternal complications being present in 20(11.1%) of vacuum extraction and 6 (18.2%) of forceps deliveries. As indicated on table 4 birth asphyxia was present in 96(53.0%) and 19 (57.6%) of vacuum extraction and forceps deliveries respectively, a difference that was statistically significant. Fresh stillbirth complicated about 3 percent of all the instrumental vaginal deliveries. In all the instrumental vaginal deliveries conducted about 60 % were associated with foetal complications.

Table 3: Maternal Complications

Complication	Vacuum Extraction	Forceps Delivery
Perineal laceration	12 (6.63%)	2 (6.06%)
Vaginal laceration	6 (3.32%)	4 (12.12%)
Cervical laceration	2 (1.10%)	0
Primary Postpartum Haemorrhage	5 (2.76%)	3 (9.09%)
Uterine Rupture /Maternal death	0	1 (3.03%)
Total	25 (13.81%)	10 (30.30%)

$$\chi^2 = 5.65, df = 4 \text{ and } p = 0.22$$

Table 4: Foetal Complications.

Complication	Vacuum Extraction	Forceps Delivery
Severe Birth Asphyxia	31 (17.13%)	4 (12.12%)
Moderate Birth Asphyxia	36 (19.89%)	7 (21.21%)
Mild birth Asphyxia	29 (16.02%)	0
Cephalhaematoma	4 (2.21%)	8 (24.24%)
Fresh Still Birth	4 (2.21%)	2 (6.06%)
Intracranial Haemorrhage	2 (1.10%)	1 (3.03%)
Total	106 (58.50%)	22 (66.67%)

$$\chi^2 = 29.15, df = 5, p = 0.00002$$

Discussion

In our unit, the rate of instrumental vaginal deliveries was 2.0% of the total births, an incidence of 1.67% for vacuum extraction and 0.30% for forceps deliveries. The most common indications for forceps and vacuum extraction deliveries were delay in the second stage of labour and medical conditions. Maternal complications were mainly lacerations of the genital tract. The most frequently associated foetal complication was birth asphyxia.

This is a retrospective observational study, which lacks control of variables, conducted at a tertiary center where complicated cases are referred and only a small proportion of the women from the community delivered there. However, the study has the advantage of getting an accurate and a baseline data. The rate of instrumental vaginal deliveries of 2.0% of total birth is higher than 0.51% recorded in Ilorin, Nigeria⁹, but less than 2.5% recorded in Ile-Ife, Nigeria¹⁰. Though the vacuum extraction rate of 1.7% was similar to 1.7% and 1.6% reported from Lagos, and Ilorin, (Nigeria) respectively^{10,11}, is lower than 3.1% and 3.5% reported from Benin-City, and Enugu, Nigeria respectively^{12,13}. However, the forceps delivery rate of 0.3% in our unit is the lowest recorded, compared to 0.82.4% from other centers in Nigeria¹⁰⁻¹⁴. All these studies cited were also single-hospital based retrospective studies and hence limited in their scope.

For both the vacuum extraction and forceps delivery, the rates reported from developed countries were much higher than the Nigerian values. In United Kingdom hospitals figures ranged from 4-26% for instrumental vaginal deliveries^{15,16}. The higher rates in hospitals from developed countries may be partly attributed to the routine use of epidural analgesia in labour and the continuous foetal heart rate monitoring in labour through use of intrapartum cardiotocography. In UMTH, epidural analgesia is not available for parturient mothers and heart rate monitoring in labour is by intermittent auscultation with Pinard stethoscope, which is not as sensitive as the continuous monitoring device¹⁷⁻¹⁸.

The preponderance of instrumental deliveries amongst teenagers and primigravida noted in this study was also reported in earlier studies^{10, 14, 19}. This pattern may be

attributed to poor progress of labour. This group of patients is also more prone to complications such as pre-eclampsia, prolonged labour, maternal exhaustion and malposition among others, which may necessitate some form of assisted delivery.

Foetal distress, a common indication for instrumental delivery in the developed world²⁰ was the underlying indication in only 15 (8.3%) of vacuum extraction and 2(6.1%) of forceps delivery. This may be as a result of infrequent diagnosis of foetal distress as a result of non-use of continuous foetal heart rate monitors in labour in our setting. Birth asphyxia judged from low Apgar score at delivery, were the commonest neonatal problems following instrumental deliveries. This was present in 96(53.0%) vacuum extraction and 19(57.6%) of forceps deliveries. These birth asphyxia and the six fresh stillbirth associated with instrumental deliveries may not be directly attributable to the procedures, but to the foetal condition preceding and/or necessitating the intervention.

The study shows a significant difference between the foetal complications in the procedure. It also shows that there is no much difference between the applications of forceps or ventous in facilitating the delivery of foetus, but it is essential for the clinicians to appropriately individualised cases and to follow the protocols for the application of the instruments so as to avoid maternal and foetal complications. It is also important to have a randomized multicentered controlled study to evaluate the relevance of instrumental deliveries in our community, thus avoiding the pitfalls of retrospective observational studies.

In conclusion, the indications for instrumental deliveries in our environment abound and these underscore their relevance in our obstetrics practice. However, perinatal/maternal mortality and morbidity associated with the procedures are indication that it is not safe in untrained hands. The provision and use of silastic rubber cups for vacuum extraction will serve to eliminate some of the complications associated with the use of the metal cups. Training of resident doctors and other medical staff in the recognition of appropriate cases and proper use of the instrument are essential in promoting effective instrumental deliveries.

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