

A 5-year retrospective review of instrumental vaginal deliveries in Uyo, Akwa Ibom State, Nigeria

EMEM A BASSEY, GABRIEL M ABAB

Department of Obstetrics and Gynaecology, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria

ABSTRACT

Context: Instrumental vaginal deliveries are deliveries conducted using obstetric forceps or vacuum extractor and are an essential component of basic emergency obstetric care.

Objective: To determine the rate of instrumental deliveries and their outcome over a 5-year period (2013–2017) at the University of Uyo Teaching Hospital.

Study Design and Methods: A 5-year retrospective review of maternity delivery records. A survey of 16 resident doctors of the department was also done to determine their views on the rate of instrumental deliveries in the hospital.

Results: During the study period, there were 6,754 deliveries; of these 109 (1.61%) were instrumental deliveries. Vacuum extractions accounted for 97 (88.99%) of the instrumental deliveries and there were only 12 (11.01%) forceps deliveries. The majority of the instrumental deliveries were carried out on booked women (78; 82.98%), with low parity (Para 1; 73.83%), term mothers (59.4%), and normal birth weight babies. There were only five stillbirths (4.59%), all of which were vacuum extractions and were comparable to 4.5% among spontaneous vertex deliveries and less than 6.2% among caesarean sections and 45.5% among breech deliveries. This was statistically significant, $\chi^2 = 114.03$, $P < 0.001$. Most of the resident doctors cited lack of proper training as responsible for low rate of instrumental deliveries.

Conclusion: The rate of instrumental vaginal deliveries in the University of Uyo Teaching Hospital is low with adverse consequences on the training of resident doctors. There is thus need to prioritize training on this life-saving skills.

Key words: Instrumental vaginal deliveries; neonatal outcome; trends; Uyo.

Introduction

Instrumental vaginal deliveries, sometime referred to as assisted vaginal deliveries, are deliveries conducted with the aid of obstetric forceps or vacuum extractor for either maternal or fetal indications to optimize fetal and maternal outcome.^[1-3] Assisted vaginal delivery is one of the six critical functions of basic emergency obstetric care and is used to shorten the second stage of labor, and as such should be available and accessible especially in low-resource settings where the caesarean section alternative is not always feasible.^[1,2,4]

The incidence of assisted vaginal delivery varies among the different regions of the world and even among the different regions within the same country. It is generally lower in developing countries with an incidence as low as 1% reported in Niger, Burkina Faso, and Mali,^[1,5] and higher in developed countries where an incidence as high as 15% has been reported.^[1,2,5-7] The choice of instrument also varies within the developed countries with vacuum

Address for correspondence: Dr. Emem A Bassey, Department of Obstetrics and Gynaecology, University of Uyo Teaching Hospital, Uyo, Akwa Ibom State, Nigeria. E-mail: emembassey70@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Bassey EA, Abah GM. A 5-year retrospective review of instrumental vaginal deliveries in Uyo, Akwa Ibom State, Nigeria. Trop J Obstet Gynaecol 2018;35:128-32.

Access this article online	
Website: www.tjogonline.com	Quick Response Code 
DOI: 10.4103/TJOG.TJOG_52_18	

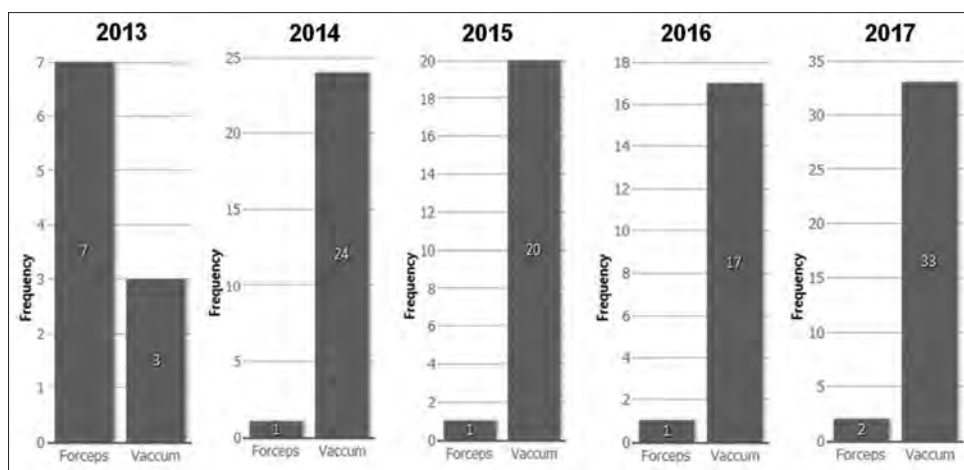


Figure 1: Yearly distribution of Instrumental deliveries

extraction more commonly done in the United States due to medico-legal reasons, while the forceps is more commonly used in Europe.^[1] There is, however, a shifting trend globally in the type of instrumental delivery done, with an increasing preference for the use of vacuum extractor and caesarean deliveries over the forceps. This is probably because the vacuum extractor is relatively easier to use, poor operator skills with forceps, and there are less maternal complications with the vacuum extractor when compared to the forceps.^[8,9]

There have been reports from various Nigerian health institutions on instrumental vaginal deliveries, but there has been no previous report from this institution. The aim of this study was to determine the incidence, trends, and outcome of instrumental vaginal deliveries in the University of Uyo Teaching Hospital.

Materials and Methods

This was a cross-sectional (retrospective) study carried out in the maternity unit of the University of Uyo Teaching Hospital, a tertiary hospital located in Uyo, the capital of Akwa Ibom State, Nigeria. Data from the delivery records of the unit covering a 5-year period from January 1, 2013, to December 31, 2017, were reviewed. Information elicited included the total number of deliveries, booking status, route of delivery, weight of baby at delivery, and maternal and fetal outcome of instrumental deliveries.

Data were analyzed using SPSS version 23 (SPSS Inc., Chicago, IL, USA). Chi-square was used as a test of significance which was set at $P < 0.05$.

Sixteen residents of the department were also surveyed to determine their opinions on instrumental deliveries in the institution, and the summary of their answers was tabulated.

Results

During the period under review, there were 6,754 deliveries recorded; the commonest mode of delivery was spontaneous vertex delivery (SVD) which accounted for 3,939 (58.3%). Instrumental vaginal deliveries accounted for only 109 (1.61%) of these deliveries; of these, there were 12 forceps deliveries (0.18%) and 97 vacuum extractions (1.44%) [Table 1].

Figure 1 shows the yearly distribution of the instrumental deliveries; 2013 had the highest number of forceps deliveries and lowest number of vacuum extractions (7 and 3, respectively). The highest number of vacuum extractions (33) was done in 2017.

Table 2 shows the biosocial variables and outcome of instrumental deliveries. The majority of them were performed on booked cases (78; 82.98%). Comparatively more cases of forceps deliveries were done on unbooked than booked cases (8 and 3, respectively). Most of these instrumental deliveries were done on women with low parity and Para 1 was the modal parity (79; 73.83%); most of the mothers were at term (59.21%) and babies with normal birth weight.

There were only five stillbirths (4.59%), and 29 (27.10%) babies born alive were assessed as being asphyxiated (Apgar scores <7) at 1 min and 12 (11.65%) assessed as being asphyxiated at 5 min. Postpartum hemorrhage (>500 mL of blood loss) was recorded in 12 women, 9 postvacuum extraction and 3 with forceps deliveries, respectively.

Table 3 shows a comparative analysis of stillbirths and the mode of delivery. The percentages of stillbirths among instrumental and spontaneous vertex deliveries when compared with babies born alive were similar (4.6% and 4.5%, respectively) and were the highest among the assisted breech deliveries/extraction group (45.5%). Using instrumental

Table 1: Total number and routes of deliveries

Mode of delivery	Frequency (%)
Breech	33 (0.49)
Caesarean section	2671 (39.52)
Destructive	2 (0.03)
Spontaneous vertex delivery	3939 (58.28)
Instrumental deliveries	109 (1.61)
Total	6754

Table 2: Biosocial variables and outcome of instrumental deliveries

Variables	Vacuum (%)	Forceps (%)	Total (%)
Mode of delivery	97 (88.99)	12 (11.01)	109
Booking status, n=94			
Booked	75 (79.79)	3 (3.19)	78 (82.98)
Unbooked	8 (8.51)	8 (8.51)	16 (17.02)
Parity, n=107			
0	0	1 (0.94)	1 (0.94)
1	75 (70.10)	4 (3.74)	79 (73.83)
2	15 (14.02)	1 (0.94)	16 (14.95)
3	4 (3.74)	3 (2.80)	7 (6.54)
4	1 (0.94)	3 (2.80)	4 (3.74)
≥5	0	0	
Gestation age (weeks), n=76			
<34	0	0	0
34-36	5 (6.58)	0	5 (6.58)
37-38	7 (9.21)	3 (3.33)	10 (13.16)
38-40	31 (40.79)	4 (3.95)	35 (46.05)
>40	24 (31.58)	2 (2.63)	26 (34.21)
Birth weight (kg), n=103			
<1	0	0	0
1-1.9	2 (1.94)	0	2 (1.94)
2-2.9	31 (30.10)	0	31 (30.10)
3-3.9	56 (54.37)	11 (10.68)	67 (65.05)
≥4	3 (2.91)	0	3 (2.91)
Apgar score (1 min), n=107			
<7	26 (24.30)	3 (2.80)	29 (27.10)
≥7	70 (65.42)	8 (7.48)	78 (72.90)
Apgar score (5 min), n=103			
<7	11 (10.68)	1 (0.97)	12 (11.65)
≥7	81 (78.64)	10 (9.71)	91 (88.35)
Condition of baby, n=109			
Alive	92 (84.40)	12 (11.01)	104 (95.41)
Dead	5 (4.59)	0	5 (4.59)
Maternal complication, n=12			
PPH (≥500 mL)	9 (75)	3 (25)	12 (100)

PPH, Post-Partum Haemorrhage

deliveries as the reference point (1), the odds of successfully delivering a baby alive is greater in instrumental, spontaneous vertex deliveries, and caesarean section and least in breech deliveries. This was statistically significant, $\chi^2 = 114.03$, $P < 0.001$.

On review of the survey of resident doctors' opinions on the rate of instrumental deliveries in the hospital, all of them agreed that the rate of instrumental deliveries especially forceps deliveries in the hospital was low. In response to a question on what they felt was responsible for this low rate, most of them (9; 56.2%) responded that there was not sufficient training on the use of forceps [Table 4].

Discussion

The instrumental vaginal delivery rate in this study was 1.61% of total deliveries with vacuum and forceps accounting for 1.44% and 0.18%, respectively. The instrumental delivery rate at the University of Uyo Teaching Hospital is low and this reported rate was lower than 3.7% reported in Abakiliki,^[8] 3.6% reported in Zaria,^[10] 4.5% reported in Lagos,^[11] and 1.95% in Jos.^[12] It was, however, higher than 0.69%, 1.06%, and 1% reported in Bauchi, Sokoto, and Ilorin, respectively.^[1,2,12,13] The preponderance of vacuum extractions over forceps deliveries was similar to what was reported in other Nigerian and African studies.^[1,2,7,8,10-13] This may be because the vacuum extractor is easier to learn and use, and the modification of the metal cup to plastic and silastic cups has resulted in fewer fetomaternal complications.^[8,9] Paradoxically, the rate of instrumental deliveries in most Nigerian reports is lower than that reported in developed countries with rates of 4.5% in the United States, more than 10% in the United Kingdom, and up to 15% in Canada.^[1,2,6,14] Thus, in low-resource settings where it should be a viable alternative for caesarean sections, it is underutilized.^[1,15]

The reasons advanced for low rate of use of instrumental deliveries include a preference for caesarean section even in conditions ideal for forceps or vacuum extraction by contemporary obstetricians probably due to medico-legal reasons or their lack of skill,^[8,16] and consequently resident doctors are not being trained properly in the use of instrumental deliveries especially the obstetric forceps.

Table 3: Comparative analysis of route of delivery and fetal outcome

Mode of delivery	Condition of baby			χ^2	P	OR (95% CI)
	Dead (%)	Alive (%)	Total			
Instrument	5 (4.6)	105 (95.4)	109 (1.6)	114.03	<0.001	1
Breech	15 (45.5)	18 (54.5)	33 (0.5)			0.058 (0.019-0.18)
SVD	177 (4.5)	3762 (95.5)	3939 (58.3)			1.02 (0.41-2.54)
CS	165 (6.2)	2506 (93.8)	2671 (39.5)			0.73 (0.29-1.83)
Total	362 (5.4)	6390 (94.6)	6752 (100)			

OR, Odds ratio; CI, Confidence interval; SVD, Spontaneous vertex delivery; CS, Caesarean section

Table 4: Summary of views of resident doctors on instrumental deliveries (n=16)

Opinion	Registrar	Senior registrar
Reasons for not using forceps		
Poor training on use of forceps	5	4
Medico-legal reasons	1	2
Lack of indication	1	3

This was corroborated in this study as a majority of the resident doctors (both junior and senior) surveyed cited the lack of proper training as the primary reason for low rate of instrumental deliveries especially the use of forceps. This trend is described in both local and foreign reports as a “disappearing,” “dying,” or “lost art” of instrumental deliveries.^[8,16,17]

There is, however, no scientific evidence to support the safety of the vacuum extractor over the forceps; Johanson and Mennon in their Cochrane systematic review concluded that compared with the forceps, the vacuum is more likely to fail to achieve vaginal delivery and be associated with cephalhematoma and retinal hemorrhage in the newborn and no more likely to be associated with low 5-min Apgar scores but was less likely to be associated with significant maternal perineal and trauma.^[18] Thus, the current trend of preference of the vacuum over the forceps may be due to operator convenience and/or lack of skills in the use of forceps and not necessarily due to safety.

Unlike in some other Nigerian studies, specifically the reports from Jos and Abakiliki, there was no declining rate of instrumental deliveries especially use of the forceps in this study. The reduction in the number of vacuum deliveries in the year 2013 in the hospital compared to other years (2014–2017) was because the vacuum extractors in the hospital were faulty (personal communication).

Most of the instrumental deliveries in this study were done on booked women with low parity (Para 1 and 2) and was similar to reports from nearby Calabar.^[19] This was unlike the findings in Bauchi and Zaria where most of these procedures were carried out on primigravidae (52.2% and 78.6%, respectively).^[11,10] This disparity could be explained by the ready recourse to caesarean sections in antenatal and labor complications involving primigravidae, and in this hospital, about 40% of all deliveries were by caesarean sections. However, in this study like most other Nigerian reports, instrumental deliveries were more likely to be carried out on women at term with normal birth weight babies.^[1,2,7,8,10]

A review of the fetal outcome in this study shows that there were only five (4.59%) stillbirths among these

instrumental deliveries, and it was comparable to 4.49% among spontaneous vertex deliveries and less than 6.18% among caesarean sections in the same institution. The high stillbirth rate among breech deliveries could be explained by the fact that many of these were macerated stillbirths and assisted breech deliveries and extractions carried out on already dead fetuses with a preference for delivery of live babies with breech presentation by caesarean section in the hospital. This was also responsible for the small number of breech deliveries compared with other routes of delivery in the hospital. The stillbirth rate was much less than 10.2% recorded from Abakiliki;^[8] however, Apgar score of <7 at 1 and 5 min of 27.10% and 11.65%, respectively, was much higher than 23.1% and 6.9% reported in Abakiliki.^[8] These disparities in rates from the two institutions could be due to the fact that the study in Abakiliki was over a 10-year period with a much larger number of instrumental deliveries.

A major limitation of this study was the fact that it was a retrospective study of the delivery records and a lot of information was missing. There were no records of failed forceps or vacuum deliveries and in many cases no indication for the instrumental delivery. There were also no records of other fetal complications and the small number of instrumental deliveries affected the power of statistical analysis and comparison of outcome between forceps deliveries and vacuum extractions.

Conclusion

The rate of instrumental deliveries is very low in this institution with the consequence of a high caesarean section rate and negative implications on the training of resident doctors. This study has shown that instrumental deliveries are safe compared to other forms of delivery in this institution. We therefore recommend the purchase of mannequins for training of resident doctors and skills update of the consultants.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Aliyu LD, Kadas AS, Hauwa MA. Instrumental vaginal delivery in Bauchi, Northeast Nigeria. *J West Afr Coll Surg* 2011;1:18-27.
2. Ochejele S, Musa J, Eka PO, Attah DI, Ameh T, Daru PH, *et al.* Trends and operators of instrumental vaginal deliveries in Jos, Nigeria: A 7-year study (1997–2003). *Trop J Obstet Gynaecol* 2018;35:79-83.
3. Unzila A, Errol R. Vacuum-assisted vaginal delivery. *Rev Obstet Gynaecol* 2009;2:5-17.

4. Laura W, Jean-Claude J, Andrew R, France D. Maternal mortality update, a focus on emergency obstetric care. UNFPA 2002;2.
5. Bailey PE. The disappearing art of instrumental delivery. *Int J Gynaecol Obstet* 2005;91:89-96.
6. Clark SL, Belfort MA, Hankins GD, Meyers JA, Houser FM. Variation in the rates of operative delivery in the United States. *Am J Obstet Gynecol* 2007;196:526.
7. Aimakhu CO, Olayemi O, Oladokun A, Iwe CAB, Umoh AV. Current practice of forceps and vacuum deliveries by Nigerian obstetricians. *Trop J Obstet Gynaecol* 2004;21:40-3.
8. Onoh RC, Ezeonu PO, Chijioke O, Onoh TP, Saidu AK, Ezeonu CT. Disappearing art of forceps delivery and the trend of instrumental vaginal deliveries at Abakaliki, Nigeria. *Afr J Med Health Sci* 2014;13:99-104.
9. Johanson R, Menon V. Soft versus rigid vacuum extractor cups for assisted vaginal delivery. *Cochrane Database Syst Rev* 2000;2:CD000446.
10. Adaji SE, Shittu SO, Sule ST. Operative vaginal deliveries in Zaria, Nigeria. *Ann Afr Med* 2009;8:95-9.
11. Emuveyan EE, Agboghoroma OC. Instrumental vaginal deliveries in Lagos, Nigeria: A 7-year study (1989-1995). *Niger Quart J Hosp Med* 1997;7:195-8.
12. Shehu CE, Omembelede JC. Instrumental vaginal delivery. *Orient J Med* 2016;28:22-7.
13. Anate M. Instrumental (operative) vaginal deliveries vacuum extraction compared with forceps delivery at Ilorin University Teaching Hospital, Nigeria. *West Afr J Med* 1991;10:127-36.
14. Royal College of Obstetricians and Gynaecologists Clinical Effectiveness Support Unit. National Sentinel Caesarean Section Audit Report. London: RCOG Press; 2001.
15. Ameh CA, Weeks AD. The role of instrumental vaginal delivery in low resource settings. *BJOG* 2009;116:22-5.
16. Bailey PE. The disappearing art of instrumental delivery: Time to reverse the trend. *Int J Gynaecol Obstet* 2005;91:89-96.
17. O'Grady JP, Gimousky M. Instrumental delivery: A lost art? In: Studd J, editor. *Progress in Obstetrics and Gynaecology*. Vols. 10, 11. UK: Churchill Livingstone Ltd.; 1993. p. 183-212.
18. Johanson RB, Menon BK. Vacuum extraction versus forceps for assisted vaginal delivery. *Cochrane Database Syst Rev* 2004 (2).
19. Ekanem E, Udoh A, Agan T, Ekott M. Instrumental vaginal operative delivery in the University of Calabar Teaching hospital. *Mary Slessor J Med* 2009;9:26-8.