

Instrumental Deliveries And Outcome In A British General Hospital

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SUMMARY

Objectives: To assess the trends in instrumental delivery in the centre of study, relating them to maternal and neonatal outcome and comparing them with the existing literature, both from Nigeria and abroad.

Methods: The notes of all the women who had instrumental deliveries in the Central Middlesex Hospital between January and March 1996 were reviewed.

Results: Four hundred and twenty women were delivered during the period of study and 46 of them (11%) had instrumental deliveries. 69.5% were vacuum deliveries while 30.5% were forceps deliveries. Thirty-five women (76%) were nulliparous and all but 4 of the women were fully dilated before delivery. The commonest indication for delivery was fetal distress/poor cardiotocograph readings – 32 women (69%), followed by prolonged second stage – 15 women (33%). Thirty-nine of the women (85%) had episiotomies, 2 of which became extended. 1 woman (2%) and 6 women (13%) had first and second degree perineal tears respectively. There were no third degree tears. Only eight out of the 46 babies (17%) had Apgar score at 1 minute less than 7, and none of them had Apgar at 5 minutes less than 8. Five babies (11%) were admitted to the Special Care Baby Unit but only 2 (4%) stayed for more than 24 hours.

Conclusion: Instrumental delivery appears to be a relatively safe procedure in the Central Middlesex Hospital. There was no significant neonatal or maternal morbidity, and no mortality in any of the cases.

Key Words: Instrumental delivery, Obstetrical forceps, Vacuum extraction, Obstetrical.

INTRODUCTION

Instrumental deliveries remain an important method of intervention in labour. In the U.K., the instrumental delivery rate has remained constant over the years staying within the range of 8-11%¹ between 1989 and 1993. Vacuum and forceps delivery each have their advocates world-wide and the Royal College of Obstetricians and Gynaecologists has recommended that "Practitioners should use the most appropriate instrument for individual circumstances"². The instrumental delivery rate in Nigeria is generally lower, however, and the high incidence of caesarean section for cephalopelvic disproportion, has been given as one of the reasons³.

Maternal and neonatal outcome differ from place to place, depending on various factors including operator experience, indication for the delivery, and the level of the presenting part in the pelvis.

This paper assesses the trend in the centre of study over a three-month period, comparing it with existing parameters in the literature and discussing possible reasons for the observed trend.

SUBJECTS AND METHODS

The centre is the Central Middlesex Hospital, Park Royal, which is a small District General Hospital in northwest London. Its population includes a poor socio-economic and multiethnic group and as such is a high-risk one. It has an average delivery rate of 2000 per annum.

Names of women who had instrumental deliveries during the time of study were manually picked out from computer printouts of the birth register. The general characteristics of each patient were recorded and include details of type and duration of labour, vaginal examination findings, as well as parity, gestational age and indications for delivery. Maternal outcome was assessed by the operator's recording of the type of perineal trauma sustained during the delivery. Neonatal outcome was assessed by Apgar scores at one and five minutes, operator and attending paediatrician's recording of any immediate injuries, midwife's recording of the babies' condition while on the post-natal ward and admissions to the Special Care Baby Unit. The Special Care Baby Unit's records for deliveries in that time period were also recorded separately and utilized.

The data compiled was analysed by computer using the Microsoft Excel software package.

RESULTS

During the period of January to March 1996, 46 women had instrumental deliveries out of a total of 420 women giving an instrumental delivery rate of 11%. Thirty-two (70%) had vacuum delivery while 14 (30%) had forceps delivery.

All the pregnancies were singleton pregnancies. The age group in which there was the highest number of instrumental deliveries was 26 – 30 (Figure 1). Thirty-five (76%) of the 46 women were nulliparous (Figure 2) and all the women were at least 37 completed weeks before delivery. Twenty-nine (63%) of the women went into spontaneous labour while the rest were either induced – 15 women (33%) or augmented – 2 women (4%). All but 4 of the women were fully dilated before delivery; 3 were 9cm dilated and 1 woman was 8cm dilated. One of the deliveries was done with the fetal head at the level of the ischial spines while the rest were all with the head below the spines. Methods of analgesia used were as follows: Epidural-52%, perineal infiltration with Lignocaine only-37%, no analgesia at all-11%. Most of the babies weighed between 2 and 4 kg; none weighed less than 2 kg and only 3 babies weighed more than 4 kg (Figure 3).

Nine out of the 14 forceps deliveries were done for failed attempts at vacuum delivery, while the remaining 5 were done for fetal distress or poor cardiotocograph (CTG) readings. In general, 32 women (69%) had poor CTG or fetal distress as the indication for their instrumental delivery. The other indications are as shown in Table 1.

Episiotomies were performed for 39 (85%) of the

women, 2 of whom developed extended episiotomies. One woman had a first degree perineal tear while 6 women had second degree tears. There were no third degree tears and none of the women had post partum haemorrhage. The distribution of perineal trauma according to instrument used is shown in Table 2.

Only 8 of the babies studied had an Apgar score of less than 7 at 1 minute and none of them had a score of less than 8 at 5 minutes (Figure 4). Five babies were admitted to the Special Care Baby Unit (SCBU). Two were admitted for vomiting and were discharged home well after 24 and 40 hours respectively. One was admitted for observation after its mother fell while holding it and was discharged back to the post-natal ward after 12 hours. The fourth baby was admitted for grunting – discharged after 36 hours observation. The fifth baby was a baby with intrauterine growth retardation, hypoglycaemia, poor feeding and mild jaundice who was born to a mother with a past history of a secondary syphilis infection. This baby was discharged home after 11 days.

The most common neonatal morbidity seen was jaundice (n=14, 30%). Four (9%) babies had mild bruising, 2 had transient tone loss in one arm and one baby had cephalhaematoma. There were no neonatal deaths.

Table I

Indications for Instrumental delivery		
Indications	n = 46	
	No.	%
Poor CTG	18	39%
Fetal distress	14	30%
Poor CTG/Fetal distress	32	69%
Prolonged second stage	15	33%
Maternal exhaustion/poor maternal effort	7	15%
Intra-uterine growth retardation	1	2%
Medical reasons	1	2%
Meconium stained liquor	4	9%

Table II

Distribution of maternal outcome according to instrument used				
Type of trauma	Forceps (n=14)		Vacuum (n=32)	
	No.	(% of total)	No.	(% of total)
First degree tear	1	(7%)	0	
Second degree tear	1	(7%)	5	(16%)
Episiotomy	10	(71%)	27	(84%)
Extended episiotomy	2	(14%)	0	
Total episiotomies	12	(85%)	27	(84%)

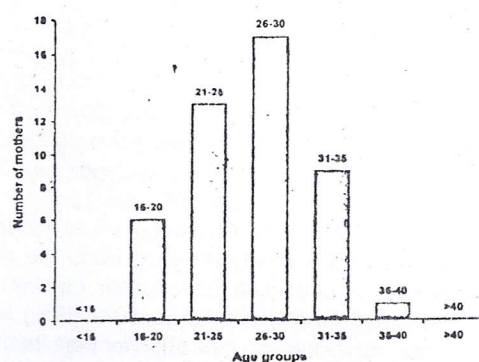


Fig. 1: Age range of patients studied

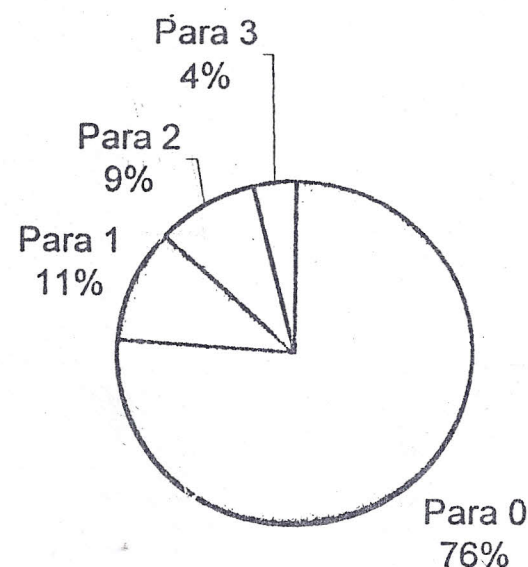


Fig. 2: Parity of studied patients

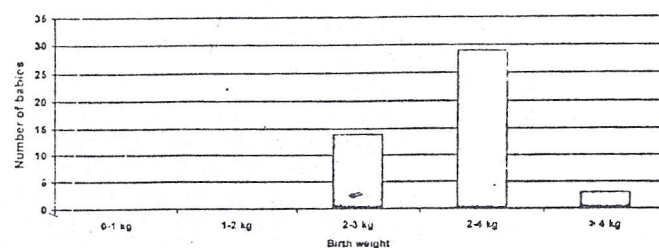


Fig. 3: Distribution of babies according to birth weight.

DISCUSSION

Instrumental delivery rates in the U.K. have remained fairly constant over the years. The rate in this study was 11%, which is within reported figures of 8-11%, between 1989 and 1993 in the UK¹. In general, instrumental delivery was found to be relatively safe for both the mothers and their babies, in terms of neonatal morbidity and maternal perineal trauma.

The vacuum rate far exceeded the forceps rate despite the fact that forceps use is still over 2 times greater than vacuum use in the UK¹. This may reflect the increasing trend of vacuum use over forceps use in the UK and the USA². Another reason may be the fact that rotational deliveries that would have been done by rotational forceps like Kiellands forceps are now done by vacuum instead. Over the years, the Kiellands and other rotational forceps have acquired a reputation of being traumatic for mother and baby. Studies show higher pain scores in women post-natally with their babies sustaining more physical trauma⁴ and 'questions still exist about its safety' even today⁵. The vacuum, on the other hand has been shown in a Cochrane systematic review⁶ to be significantly less likely than forceps to be associated with significant perineal and vaginal trauma. Although the same review showed a higher association with cephalhaematoma and retinal haemorrhages from vacuum

use, there was no difference in low Apgar scores at 5 minutes or long-term follow-up of mothers and children between the 2 instruments i.e. vacuum and forceps. However, there have been no randomised controlled trials comparing specific instruments and the data available from the published controlled trials cannot be analysed separately to compare the vacuum with forceps like the Kiellands in their use for rotational deliveries².

From the available literature, it appears that the instrumental delivery rate in Nigeria has been comparably low. Anate recorded a rate of 0.51% for total instrumental deliveries over a 4 year period in Ilorin⁷ with forceps accounting for 56% and vacuum for 44%. For forceps deliveries alone, figures range from 2.1% in Ilesha³ to 6% in Ibadan⁸. Several suggestions have been raised to explain this lower instrumental delivery practice. These include the relatively recent introduction of the instruments into African obstetric units⁷ and the fact that there is a high caesarean section rate as a result of a comparably high incidence of cephalopelvic disproportion^{3,8,9}. Lack of availability of the instruments and lack of skill of the residents in training, who are frequently the obstetric personnel available at the crucial moments when such a delivery is indicated, may be contributory. The routine use of epidural analgesia in labour in the Western world, which is known to affect the dynamics of the second stage of labour¹⁰, compared with its rare use in Nigeria has also been suggested as a possible cause of the difference in instrumental delivery rates¹¹.

The general characteristics of the women were largely similar to those commonly seen in the literature. The fact that previously nulliparous women are more likely to have an operative vaginal delivery as was the case in this study, is well documented^{3,12}. An untried pelvis and a relatively rigid perineum increase the likelihood of delay in labour and are plausible reasons for this finding.

The commonest indication for delivery was poor cardiotocograph readings/fetal distress followed by delayed second stage of labour. This is contrary to other studies from both the UK and Nigeria where the reverse is the case^{7,13,14,15}. It could be that fetal distress is over-diagnosed in the unit of study. A normal fetal heart rate tracing usually guarantees a healthy non-acidotic fetus. However, suspicious and abnormal fetal heart rate traces on the cardiotocograph are not always associated with acidosis and as such the use of fetal heart rate monitoring should be as a screening tool and not a diagnostic one¹⁶. On the other hand, it could be a genuine finding due to the large population of high-risk patients seen in the unit.

The issue of level of dilatation before instrumental delivery is a controversial one. In this study all except 4 of the women were fully dilated. These 4 women had successful vacuum deliveries. The possibility of using the vacuum before full dilatation has always been recorded as one of its advantages. In two different Nigerian studies, 109 and 104 women respectively, were successfully delivered in the first stage of labour by vacuum extraction^{17,18}. It used to be the case in the UK that in carefully selected cases, the vacuum, especially the soft silastic cup, was used to achieve successful delivery in the late first stage of labour¹. Sixty percent of obstetricians responding to a survey in the UK would consider using the vacuum before full dilatation¹. More recently, however, the Royal College of Obstetricians and Gynaecologists stated in an October 2000 guideline that forceps and vacuum extractor deliveries before full

cervical dilatation are contraindicated². The only possible exceptions to this rule was stated as vacuum delivery of a second twin where the cervix has contracted or with a cord prolapse at 9cm dilatation. Considering that it is usually residents with relatively little experience with instrumental deliveries that perform them most often, the Royal College injunction does not appear to be an unreasonable one.

Regarding maternal outcome, there were no third degree lacerations although there was a high episiotomy use rate. Controversy also exists about the use of episiotomy and evidence from the UK shows that obstetricians are more likely to perform them than midwives¹⁹. Recent studies show that episiotomies, especially midline ones, actually increase the risk of third degree perineal lacerations^{20,21}. There is also no evidence to support the popular opinion that they result in improved healing or less trauma than a spontaneous tear²². Even those studies that show a protective effect of episiotomy on the occurrence of severe lacerations, still show that restrictive as opposed to liberal use is to be preferred²³. In an Australian centre, a method of preventing lacerations using perineal manipulation resulted in an intact perineum in 68% of the cases, which included forceps deliveries²⁴.

Many studies show the rate of maternal trauma including episiotomy to be higher in forceps than in vacuum deliveries^{7,16,25,26}. Although there was no difference in maternal trauma between the 2 groups in this study (Table 2), the 2 extended episiotomies were caused by forceps delivery.

Neonatal outcome was also good. Jaundice was the most common morbidity. Though mild jaundice is known to occur more often in babies that have had instrumental deliveries, particularly vacuum deliveries^{7,26,27,28}, its significance is unclear as healthy neonates can also develop jaundice. Cephalhaematoma, a more serious form of morbidity, was seen in only one baby who was delivered by vacuum. This correlates with the evidence from a systematic review, which shows that the vacuum is more likely than forceps to be associated with cephalhaematoma⁶. Twenty-six (57%) of the 46 babies studied had no complications whatsoever.

The Apgar scores were good; there was no baby with a score of less than 7 after 5 minutes. Studies from the UK and the USA show similar findings and suggest that instrumental deliveries per se do not cause neonatal depression^{5,14,29}. A Nigerian study, however, showed relatively low mean Apgar scores at 5 minutes (<6) and a high incidence of neonatal admission to the special care baby unit⁷. The reasons for this are unclear as delay in second stage was a much more common indication for operative vaginal delivery than fetal distress (56.8% and 16.3% respectively) in that study. Operator experience and risk status of patients may however be contributory.

CONCLUSION

Instrumental delivery appears to be a relatively safe practice in the centre of study. This may have been due to the high incidence of vacuum use and to careful case selection. A larger study would help compare vacuum with forceps delivery more accurately and clarify what situations are ideal for the use of one or the other.

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