

Assisted Vaginal Deliveries in Far South of Jordan

Mitri Rashed (1)
 Areej Bisharat (2)
 Bassam Nusair (3)
 Majida Al-Sukkar (4)
 Najwa Al-Sunna (5)

(1) Mitri Rashed MD JBOG Senior specialist in Obstetrics & Gynaecology Prince Hashem Bin Abd-Allah The Second Military Hospital-Aqaba Jordan.

(2) Areej Bisharat MD JBPN Specialist in Paediatrics & Neonatologist Queen Rania Al-Abdulla children Hospital-Amman Jordan.

(3) Bassam Nusair MD JBOG Senior Specialist in Obstetrics & Gynaecology King Hussein medical centre-Amman Jordan.

(4) Majida Al-Sukkar MD JBOG Specialist in Obstetrics & Gynaecology King Hussein medical centre-Amman Jordan.

(5) Najwa Al-Sunna MD JBPN Senior Specialist in Paediatrics & Neonatologist, Queen Rania Al-Abdulla children Hospital-Amman Jordan.

Correspondence:

Mitri Rashed MD JBOG
 Senior specialist in Obstetrics & Gynaecology
 Prince Hashem Bin Abd-Allah The Second Military Hospital-Aqaba
 Jordan
Email: mitrirashed@yahoo.co.uk

ABSTRACT

Objective: To determine the rate, indications and complications of instrumental deliveries at Prince Hashim Ben Abdullah The Second Hospital (former name Princess Haya Bent Al-Hussein), Aqaba, Jordan.

Methods: This retrospective observational study has been carried out over a four-year period between 1st January 2012 and 31st December 2015. The medical records of all patients who underwent instrumental deliveries were reviewed and analyzed.

Results: During this four-year period 238 successful instrumental deliveries were performed out of 9,767 deliveries with a rate of 2.56%. The commonest instrument used was vacuum (202/240) and 36 patients were delivered by forceps. The indications were; presumed fetal distress (132), prolonged 2nd stage of labor (85) and maternal exhaustion (21). Maternal complications reported were postpartum hemorrhage

(18) and different degrees of genital tract tears (28). Fetal complications registered consisted of 34 cases of which (11) were cases of Erbs palsy, (12) were cases admitted to NICU for observation and one case was diagnosed with cerebral palsy.

Conclusion: Our study showed a lower rate of operative vaginal delivery in comparison to the international figures. This may be attributed to the lack of epidural anesthesia which increases the incidence of instrumental deliveries, in addition to the simple experience of the attending residents who fear possible complications of applying these instruments and the potential subsequent litigation. The complications reported in our study were expected in assisted vaginal deliveries (AVD) and mimic those mentioned in the literature.

Key words: instrumental deliveries, indications, complications, Jordan

Conclusion

Assisted vaginal delivery offers the option of an operative procedure to safely and quickly remove the infant, and to safeguard mother and obstetrician from a difficult or even hazardous situation when spontaneous vaginal delivery does not occur within a reasonable time. A successful assisted or operative vaginal delivery trial avoids caesarian section with its attendant uterine scar and implications for future pregnancies. It also avoids potential birth asphyxia from prolonged fetal and cord compression. Reviews of delivery statistics showed considerable variation in the incidence of assisted vaginal deliveries, but the range is usually between 10% and 20% of all deliveries (1, 2). Whether the method employed is the ventouse (vacuum extractor) or the obstetrics forceps, the operator can expect optimal results only when careful attention is given to the indications, prerequisites and performance of the procedure.

Methods

This retrospective observational study included all pregnant ladies booked in the antenatal clinic and unbooked patients admitted in early labor for whom assisted vaginal delivery was indicated later. It also included all those cases coming in to the emergency room at any time for whom assisted vaginal delivery was indicated.

The medical records of all patients and their babies who underwent AVD at Prince Hashem Ben Abdullah The Second hospital between 1st of January 2012 and 31st of December 2015 were reviewed and analyzed.

The age, parity and the indication for the AVD were recorded. The decision to undertake an AVD was in every case made by

the obstetrician in charge. The procedure was performed by the specialist or by attending resident. All AVDs were performed using either metallic cup (Malstrom or Birds) or obstetrician forceps (long and short Simpson or Wrigly's). The prerequisites of application are mentioned in (Table 1) (2). Either Foley catheter or prostin vaginal tablets (dinoprostone 3mg) or both were used for induction of labor in indicated cases. Artificial rupture of membranes or oxytocin or both were used for augmentation of labor. Pethidine was the main analgesic given in the 1st stage of labor, and local analgesics (lidocaine) infiltrated in the perineum were the pain killers of the second stage.

If there were insufficient uterine contractions in the 2nd stage of labor, this was corrected using oxytocin infusion to achieve regular uterine contractions; (three or more uterine contractions in 10 minutes each lasting >40 seconds). AVD was done when the 2nd stage of labor was prolonged for more than 2 hours for nullipara patients and more than one hour for multipara patients. Presumed fetal distress was diagnosed by electronic fetal monitoring which has a higher false positive rate for detection of fetal hypoxia and acidosis. Further investigation by fetal blood scalp sampling and PH measurement is usually indicated to avoid unnecessary intervention, but unfortunately our unit does not have a fetal blood PH sampling machine. Maternal exhaustion and fatigue was diagnosed when the mother's pushes were insufficient to descend the presenting part further.

Unsuccessful trial of AVD was elicited with failure of descent of the presenting part after three successive pulls or five pop-offs of the vacuum cup with resort to lower uterine segment caesarian section.

Maternal complications that were reported from the medical records of the patients constituted different degrees of vaginal

Table 1

	Prerequisites for operative vaginal delivery
Full abdominal and vaginal delivery	<ul style="list-style-type: none"> • Head is $\leq 1/5$ palpable per abdomen • Vertex presentation • Cervix is fully dilated and membranes ruptured • Exact position of the head can be determined so proper placement of the instrument can be achieved • Pelvis is deemed adequate
mother	<ul style="list-style-type: none"> • Informed consent is obtained and clear explanation given • Maternal bladder has been emptied recently • Indwelling catheter should be removed or balloon deflated • Aseptic techniques
staff	<ul style="list-style-type: none"> • Operator must have the knowledge, experience and skills necessary to use the instruments • Adequate facilities and back-up personnel are available • Back-up plan in place in case of failure to deliver anticipation of complications that may arise (e.g. shoulder dystocia, postpartum hemorrhage) • Personnel present who are trained in neonatal resuscitation

or perineal tears and postpartum hemorrhage. The diagnosis of the postpartum hemorrhage relied on estimation of blood loss >500cc with drop of PCV value ≥ 5 . Fetal complications were reported by reviewing the medical records of the babies.

The aim of this study was to determine the rate, indications and short term maternal and neonatal complications of AVD in two military hospitals in the south of Jordan.

Results

In this study, a total of 8,791 deliveries in the years 2012 to 2015 were performed after excluding preterm deliveries and breech deliveries (976 case). During the study period 238 successful instrumental deliveries were done with a rate of 2.7%. The mean maternal age of the study population was 26.45 years and the mean parity was 1.1 (Table 2). Out of these 238 patients, 136(57.14%) were primigravidas; the remaining were multigravida (parity range 1-8).

Table 2

Mode of delivery	No. of patients	Percentage
NVD	7195	73.67%
CS	2332	23.87%
AVD	238	2.7%

The main instrument used was metallic vacuum cup (202/238) and (36/238) deliveries were performed using obstetrics forceps. 20 LUSC/S were undergone after unsuccessful trials of vacuum assisted vaginal deliveries. A zero failure rate was found using the forceps. The commonest indication for AVD was presumed fetal distress (Table 3). The maternal and fetal complications reported are shown in (Table 4) where the commonest maternal complication was different degrees of genital tract tears (25/238) and three of these patients needed repair under general anesthesia. The postpartum hemorrhage which afflicted 18 patients was mainly secondary to genital tract trauma followed by the uterine atony and the majority of these ladies received blood products.

Fetal complications registered consisted of (11) cases of Erbs palsy, (12) cases were admitted to NICU for observation and one case of cerebral palsy (Table 5). The main cause of new born admissions to the neonatal intensive care unit (NICU) was for observation to rule out sepsis due to prolonged premature rupture of membranes. All the admissions were discharged home well except three cases. One was referred to King Hussein Medical Center due to suspected intestinal obstruction, another was diagnosed to have Rh incompatibility, and the third one was diagnosed to have cerebral palsy on follow up visits.

Table 3

Number of patients	Parity
136	Primigravida
36	Para 1
27	Para 2
12	Para 3
11	Para 4
16	Para 5 or more

Table 4

Number of patients	Indication of AVD
13	Presumed fetal jeopardy
85	Prolonged 2nd stage of labour
12	Maternal fatigue and exhaustion

Table 5

Complication		Percentage	Total No.
Maternal	Postpartum hemorrhage	7.56%	18
Maternal	Genital tract injuries	10.5%	25
Fetal	Admission to NICU	8.4%	20
Fetal	Clavicular fracture	1.68%	4
Fetal	Erb's palsy	3.78%	9
Fetal	Subdural hematoma	0.42%	1

Discussion

Overall instrumental delivery rates worldwide are around 10%, but vary widely from 1.5 of deliveries in Czech Republic to 15% in Canada. Even within a single country, the range is wide (e.g. in Scotland, from 4% to 26% in primiparous women(3), and in the United States 1-23 percent(4).

The precise incidence of operative vaginal delivery in the United States is unknown, but forceps or vacuum delivery was coded over the birth certificate as the method of delivery for 8% of vaginal births in 2002(5). The total rate of operative vaginal delivery in 2014, the last year for which complete data are available in the United States, was only 3.1%. Obstetric forceps were used in 0.57% of deliveries and 2.64% were delivered via the vacuum extractor (6). So in most countries the overall rate is reasonably constant, but there is a gradual move away from forceps towards vacuum due to the perception that vacuum is easier and safer to use.

In our study the incidence of instrumental deliveries was 2.7% which is much below the average rate; this might be attributed to more than one factor.

First, the lack of use of regional anesthesia as routine in the labour rooms. This is now well documented to increase the incidence of instrumental deliveries (7,8) by several mechanisms, one mechanism being the reduction in serum oxytocin level which results in a weakening of uterine activity and this may be due in part to intravenous fluid infusion being given before epidural analgesia. Maternal effort at expulsion can also be impaired, causing fetal malposition during descent (9). Five trials that included 2703 nulliparous women were analyzed by Sharma and colleagues (2004). Women given epidural analgesia had a two fold increase in rate of instrumental delivery compared with those given parenteral analgesia - 13 versus 7% (8).

The second factor participating in the low rate in our set up is the lack of experience of the delivery room attending obstetricians (most of the time they are residents).

Lastly, the fear of potential neonatal complications and possible litigation in courts makes them resort to the abdominal delivery as a reasonable alternative.

Maternal indications of operative vaginal delivery are most commonly due to maternal distress, maternal exhaustion, or undue prolongation of the second stage of labor (2, 12). Fetal indications commonly encountered are malposition of the fetal head, with relative dystocia which occurs more frequently with regional anesthesia (4). Fetal distress is a commonly cited indication. This expression is subject to varied interpretation which may range from a brief bradycardia to prolonged late decelerations with acidosis. So a "presumed fetal jeopardy" may be a preferable term(1), in conjunction with recording of as precise a description of the situation as possible in order to validate the indication. Presumed fetal jeopardy was the main indication of operative vaginal delivery in our study (132/238) 55.46% followed by prolonged second stage of labor (85/238) 35.7%

Most of the complications of AVD have also been reported following spontaneous vaginal and even abdominal deliveries, but their incidence is greater with AVD(1).

Maternal complications are usually those of soft tissue trauma and tend to be reported more frequently with the use of forceps than with ventouse (12); they can include uterine, cervical or vaginal injury, laceration or hematomas and the consequent risk of postpartum hemorrhage. In this study 25 patients had genital tract injuries (perineal, vaginal, and cervical) and 18 cases had postpartum hemorrhage (7.56%), of which 11 were secondary to genital tract trauma, and the remainder were caused by uterine atony.

Data from several sources, including several large randomized trials performed in industrialized countries, indicate that the prevalence rate of PPH of more than 500 mL is approximately 5% when active management is used (which is adopted in our hospitals) versus 13% when expectant management is used(13). Cervical laceration is most commonly associated with forceps delivery, and the cervix should be inspected following all such deliveries. Vaginal sidewall laceration is also most commonly associated with operative vaginal delivery.

Fetal complications of forceps delivery include transient facial marks, facial nerve palsies and fracture of facial bone or skull (1). Injuries from vacuum include minor and occasionally severe scalp injuries, including scalp bruising, abrasions, lacerations, cephalhematoma, subgaleal hematoma and intracranial hemorrhage (12). 9 babies whose deliveries were complicated by shoulder dystocia suffered from Erbs palsy with concomitant clavicular fractures in 4 of them. Shoulder dystocia and its

peripheral nerve palsy complications (Erb's palsy) are slightly more common after AVD than after spontaneous delivery. The risk of shoulder dystocia is now mainly with vacuum use. This may be related to the physics of extraction, specifically the vector of force generated by the vacuum cup versus forceps(10,12,13). Unfortunately we could not elicit the incidence of shoulder dystocia in this study due to the poor notes in the medical records.

The only severe fetal complication reported was for a baby who was an outcome of vacuum delivery with an indication of fetal distress and cord prolapse. This baby was delivered with a low Apgar score at 5 minutes and had bilateral cephalhematoma and was ventilated for three days. His brain CT scan showed subdural hematoma and he was diagnosed to have hypotonic ataxic cerebral palsy on follow up visits. In literature the reported incidence of fetal death or severe fetal injury from vacuum extraction is low, ranging from 0.1-3 cases per 1,000 procedures (10).

Conclusion

Our study showed a lower rate of operative vaginal delivery in comparison to the international figures. This may be attributed to the lack of epidural anesthesia which increases the incidence of instrumental deliveries, in addition to the simple experience of the attending residents who fear possible complications of applying these instruments and the consequent litigation. The complications reported in our study were expected in assisted vaginal deliveries and mimic those mentioned in the literature.

References

1. David K. James, Philip J. STEER; Carl P. Weiner; Bernard Gonik. High Risk Pregnancy, Management Options. In: Robert Hayashi, Assisted Vaginal Delivery. 4th edition. Saunders, an imprint of Elsevier 2011
2. Royal College of Obstetricians and Gynecologists. Operative Vaginal Delivery. Guideline No.26 January 2011.
3. John Studd. Progress in Obstetrics and Gynecology. In: Asma Khalil Pat O'Brien, editor. Operative Vaginal Delivery. Volume 16. Elsevier Churchill Livingstone 2005
4. Clark SL, Belfort MA, Hankins GD, et al. Variation in the rates of operative delivery in the United States. *Am J Obstet Gynecol* 2007; 196:526.e1.
5. F. Gary Cunningham; Kenneth J. Leveno; Steven L. Bloom; John C. Hauth ; Larry Gilstrap III; Katharin D. Wenstrom, Williams Obstetrics. In: Forceps Delivery and Vacuum Extraction. 24th edition. The McGraw-Hill Companies 2014
6. Hamilton BE, Martin JA, Osterman MJ, et al. Births: Final Data for 2014. *Natl Vital Stat Rep* 2015; 64:1.
7. Janye Althaus, Joseph Wax. Analgesia and Anesthesia in Labor. *Obstet Gynecol Clin N Am* 32(2005)231-244
8. Anim-Somuah M, Smyth R, Howell C. Epidural versus non-epidural or no analgesia in labour. *Cochrane Database system. Rev* 2005;(4):CD 000331.
9. EHC Liu, ATH Sia. Rates of Caesarian section and instrumental vaginal delivery in nulliparous women after low concentration epidural infusions or opioid analgesia: systemic review. *BMJ* doi:10.1136/bmj.38097.590810.7C (published 28 May 2004)
10. John P O'Grady; Carolyn Taugher. Vacuum Extraction. Available from: [http:// emedicine.medscape.com/article/271175](http://emedicine.medscape.com/article/271175)
11. John R Smith; Barbara G Brennan. Postpartum Hemorrhage. Available from: <http://www.emedicine.com/medtopic3568>
12. Royal College of Obstetricians and Gynecologists. Shoulder Dystocia. Guideline No.42 December 2005
13. Vincenzo Berghella. Obstetrics Evidence Based Guidelines. In: Vincenzo Berghella. Editor. Shoulder Dystocia. First EDITION. Informa Health 2007