

Trend in Instrumental Vaginal Deliveries at the National Referral Hospital in Bhutan: A Review of Hospital Records

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ABSTRACT

Instrumental vaginal delivery (IVD) is a core signal function in emergency obstetric and neonatal care. The revival of declining trend in IVDs worldwide against an alarming rise in cesarean section must be viewed in a holistic manner. Every country must devise its own evidence–yet context-based strategies to revive the dying art of this lifesaving obstetric procedure.

Keywords: Emergency obstetric and neonatal care, Healthcare worker, Instrumental vaginal deliveries.

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INTRODUCTION

Instrumental vaginal delivery (IVD) is performed for obstetric conditions, such as prolonged second stage, fetal compromise, maternal exhaustion, or certain maternal conditions to shorten the second stage.¹ Either forceps or a vacuum extractor is used per vagina to facilitate or expedite the delivery of the baby. Worldwide, 10–20% of laboring women need obstetric interventions or assistance, and IVDs comprise about 6–12% of the total interventions.² Instrumental vaginal delivery is a core signal function in both basic and comprehensive emergency obstetric and neonatal care.^{3–5} This is in line with Millennium Development Goal 5 in reducing maternal morbidity and mortality and improving overall maternal health.

However, the trend of performing IVDs is declining worldwide, and this downward trend is more pronounced in developing countries. It is estimated that 10–15% and 4.5% of births in the USA and the UK are achieved through IVDs, respectively.⁵ Similar rates of IVDs are seen in Australia, Canada, and the Netherlands, with Sweden showing an increasing trend.^{2,6} On the contrary, developing countries' records in terms IVDs are dismal at very low rates.^{1,2,7} What is more worrisome is the alarming rise in cesarean deliveries across the globe. The rising global cesarean section rate of 21% with wide disparities across the regions is higher than the WHO limit of 15%.^{8,9} Therefore, reviving the practice of IVDs would be one of the options to counteract the rising rate of cesarean section. This is especially important when the option of IVD is preferred over the cesarean section in the second stage which is more difficult and associated with more adverse perinatal outcomes.^{1,5}

The objective of this review is to study the trend of IVDs in the last 5 years at the national referral hospital and focus on strategies to revive the dying art of IVDs at the institutional level and country at large.

Bhutan health system: Strategic location of Comprehensive Emergency Obstetric and Neonatal Care Centers (CEmONC).

Bhutan provides free healthcare to its citizens as enshrined in the constitution. The three-tier health system in Bhutan comprises basic health units (BHUs) at the grass-root level followed by district hospitals and regional referral hospitals and the national referral hospital at Thimphu. In terms of obstetric care to pregnant women, the country currently has seven CEmONC centers at strategic

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locations across the country (Fig. 1). Emergency obstetric cases are referred to these centers by land or air ambulance services depending on the geographical location, availability of roads, and weather conditions. As of 2020, 94% of the deliveries occurred in healthcare institutions, and over the last two decades or so, the country experienced a significant reduction in maternal mortality from 380 to 89 per 100,000 live births.^{10,11} In spite of this remarkable improvement in maternal outcomes, still there are poor perinatal outcomes attributed to adverse events occurring in the second stage of labor.

Current practice of IVDs at the national referral hospital.

Jigme Dorji Wangchuck National Referral Hospital currently has four full-time consultants and seven residents in the Department of Obstetrics and Gynecology. The department has 36 beds in the maternity ward, 5 delivery suites, 10 beds in the birthing center, and 12 beds in the epidural ward. In 2020, the hospital recorded a total of 4,241 deliveries, of which 1,370 and 165 were cesarean section and IVDs, respectively.¹² This converts to 32% cesarean section and 3.9% IVDs. The birthing center uses the electrically driven vacuum extractor with silastic cups of various sizes (Fig. 2A). The vacuum extractor has a safety pressure range coded in green color on the pressure gauge with foot pedal control (Fig. 2B). The cups are reusable and disinfected with a high-level disinfectant solution in accordance with infection control guidelines of the hospital. The forceps available are those of low pelvic and outlet cavity deliveries only (Fig. 2C).

Subsequent to indications, IVDs are performed upon fulfillment of criteria and absent contraindications set up by Royal College of Obstetricians and Gynaecologists (RCOG) (Table 1).^{13,14} Brief communication regarding the indication and risks associated with the procedure is provided, and verbal consent is obtained. Consultant pediatrician or resident on call is informed about the procedure. Except for a few who are already on epidural analgesia, mothers do not receive anesthesia. Episiotomy is not routinely performed in either normal deliveries or IVDs. Upon successful IVDs and documentation in an instrumental delivery procedure form, the mother is monitored immediate postpartum as per the standard operating procedure. Antibiotics are not routinely prescribed. Analgesics in the form of oral paracetamol are given to the mother. Early essential newborn care (EENC) is practiced after the delivery of the baby. The procedure is abandoned in favor of emergency cesarean section when there is no descent of fetal head even after three moderate pulls or three cup detachments or delivery is not accomplished within 20 minutes of the procedure. Sequential use of instruments is not practiced in our setting due to increased adverse maternal and neonatal outcomes.¹⁴

MATERIALS AND METHODS

The trend of IVDs and cesarean section at the national referral hospital.

Numerical data were compiled from annual birth records from January 1, 2016, to December 31, 2020, maintained at the medical record section of the hospital. The total number of births, total

cesarean sections, and total IVDs (forceps and vacuum) compiled from the medical record section were cross-checked with the birth register maintained at the birthing center and the maternity ward using the mother’s citizenship identity card number. Over the last 5 years, the hospital recorded a total of 22,420 deliveries, of which 6,785 were cesarean section (30.2%) and 643 IVDs (2.9%). The hospital recorded a steady cesarean section rate between 27 and 32% (Fig. 3). This is in contrast to the overall cesarean section of the nation, which stands at 18.7%.¹⁵ The higher cesarean section rate at the national referral hospital is presumed secondary to high-risk

Table 1: RCOG contraindications and prerequisites for IVD

Contraindications	Prerequisites
<ul style="list-style-type: none"> • <34 weeks of gestation • Face presentation (for vacuum) • Fetal bleeding or bone disorder • Cervix not fully dilated 	<ul style="list-style-type: none"> • Cervix fully dilated • Membranes ruptured • Fetal head engaged • Presentation and station determined • Assessment of caput and molding • Pelvic adequacy determined • Maternal preparation • Staff preparation



Fig. 1: Location of comprehensive emergency obstetric and neonatal care centers

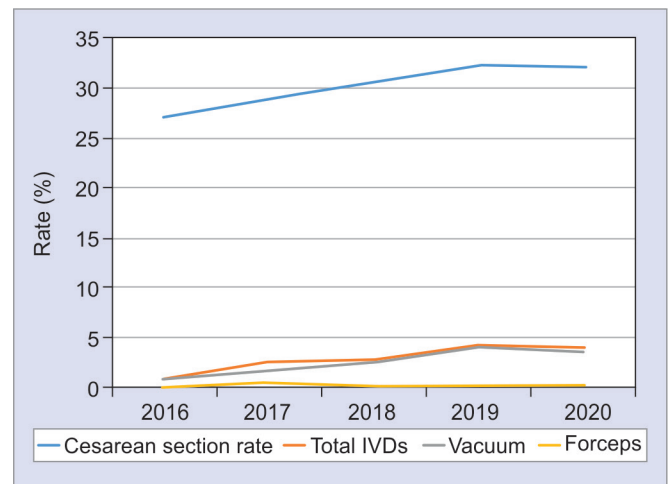


Fig. 3: Trend in the mode of delivery, JDWNRH, 2016–2020



Figs 2A to C: (A) Silastic vacuum cup; (B) Electric vacuum extractor; (C) Low outlet forceps

obstetric referrals. There is a gradual increase in total IVDs over the last 5 years although the majority of these are vacuum (95%). In 2017, the hospital under the new departmental leadership reintroduced the forceps delivery, resulting in 5% of the total IVDs with forceps.

DISCUSSION

Globally, the trend in IVDs is declining with a simultaneous rise in the rate of cesarean section.^{16,17} In a free healthcare system like ours, the benefits of IVDs are significant in terms of shorter hospital stay, decongestion of the maternity ward, and overall financial gain to the government. Women who undergo IVDs are discharged at 24 hours compared to those who undergo cesarean section, who are discharged on the third postoperative day. Cesarean section is associated with more adverse perinatal outcomes compared to IVDs.^{1,6} With the start of a residency program in obstetrics and gynecology in 2014 at Khesar Gyalpo University of Medical Sciences of Bhutan, the rate of IVDs is expected to increase over the years. Contrary to many developing countries, the positive trend in IVDs in our institute somehow provides the check and balance of the rising rate of cesarean section.^{18,19} Many countries practice defensive obstetrics especially in the private sector. Cesarean section has replaced IVDs due to fear of litigation, lack of skilled operator or equipment, and financial gain associated with it.^{17,20,21}

The current trend in our institute has also clearly shown the preference for vacuum extraction over forceps over the last 5 years. This is logical as the majority of the IVDs are performed by the resident on call. Like elsewhere in the world, the technical ease and the perceived notion of lesser adverse perinatal outcomes and medicolegal implications associated with vacuum deter health workers from choosing forceps.²² Using the social media platform to collect their views on IVDs, all residents at the department preferred vacuum extraction over forceps. They opined vacuum is easy to use. Most of the consultants reside away from the hospital premises due to shortage of staff quarters. Although one consultant is designated as resident on call for 24 hours, attending emergencies and supervising the residents on time are difficult especially during off-hours.

Only two consultants at present perform forceps delivery, thereby attaining a very low overall uptake of forceps delivery at the hospital. Per-vaginal examination findings in terms of fetal position and station have been shown to be faulty in around a quarter of the cases.^{23,24} This is especially true when there is caput or molding. Forceps application is extremely difficult when fetal head position and station could not be ascertained, as told by our residents. None of them tried forceps due to a lack of supervision and experience. Intrapartum sonography is an attractive option to overcome this difficulty as recommended by the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG).²⁵

The positive impact of simulation on uptake of IVDs in labor and delivery has been shown in numerous studies.^{26–28} In their systematic review of IVDs, Bligard et al. found improved cognitive, affective, and psychomotor domains of the residents after simulation-based training.²⁶ Advanced life support in obstetrics (ALSO), managing obstetric emergencies and trauma (MOET), and RCOG Operative Birth Simulation Training (ROBuST) from well-recognized organizations regularly provide simulation-based training to healthcare workers involved in obstetric care.^{28,29} However, the cost factor in procuring such a high-fidelity simulation model may not be a feasible option in a resource-poor setting like ours. Instead, work place-based assessment (WPBA) in the form of direct observation of procedural skills (DOPS) has gained popularity among the obstetrics and

gynecology residents in our institute although few IVDs are performed due to the emergent nature of such procedural skills.^{30,31}

Compared to the traditional didactic approach, the skill and drill method or the competency-based training in emergency obstetric care has proven to be effective in performing IVDs in resource-limited settings.^{3,4,20} Bhutan in the past succeeded in its implementation of competency-based training in emergency obstetric care with the subsequent setting of comprehensive emergency obstetric and neonatal care centers.¹¹ Few midwives were also trained in performing IVDs in addition to general doctors. This strategy of task delegation and task shifting in emergency obstetric services has proven effective in countries with a scarcity of skilled healthcare workers.³² Lack of clear-cut policy at the bureaucracy level to maintain and sustain the competency-based training program lead to its failure.¹¹ Moreover, the Bhutan Health and Medical Council Act enacted a few years ago reserved the right to practice of IVDs only for doctors. The only way to revive the dying art of IVDs is through the preservice curriculum for midwives and internship programs and in-service competency-based training for geographically challenged locations in the country. The WHO in its joint statement has defined a skilled health worker in maternal and neonatal health as the one who can perform all the signal functions of emergency obstetric and neonatal care individually or collectively.³³ There were no records of IVDs in the district hospitals, which primarily function as basic emergency obstetric care centers in the last 1 year.¹⁰ The message is loud and clear: The lack of skill and competence of the healthcare workers as defined by the WHO!

Having acquired all the three domains of adult learning, namely cognitive, affective, and psychomotor, through different modalities of training, it would still remain a challenge to perform IVDs if the equipment is not in place.^{20,21} A health worker trained in IVDs may not be able to perform vacuum extraction where there is no electricity in remote areas. A handheld vacuum extractor, like the Omni Kiwi Cup, would prove much better than waiting for the chopper to land in the morning for medical evacuation. In corollary to this, a resident performing a vacuum extraction using an electric-driven extractor would forgo forceps due to the lack of skills or competence in face of power failure and unavailability of a manually working vacuum extractor. A case of posterior asynclitism or occiput posterior position is not amenable to vacuum extraction with the silastic cup unless a more pliable Omni Kiwi Cup is available.³⁴ Forceps have their own unique application in the extraction of the after-coming head in breech delivery, conditions warranting avoidance of maternal Valsalva maneuver, preterm delivery, and HIV-infected mothers where vacuum may cause scalp abrasion or laceration.³⁵ There were bad obstetric events resulting from the prolonged second stage in the face of delayed evacuation due to landslides or snowfall and lack of a handheld vacuum extractor. Thus, clinical circumstances may warrant the health worker to choose the type of IVD as agreed by the major obstetrics and gynecology organizations.^{14,22} Nevertheless, the necessity of skill and experience of the operator should not be forgotten against the odd clinical situation.

CONCLUSION

At the institutional level, the positive trend in performing IVDs must be maintained through regular training and certification of obstetricians by international obstetrics and gynecology organizations. The residents must continue performing IVDs through the implementation of DOPS. The dying art of forceps delivery at the hospital is in need of timely and fresh impetus in

view of the challenging and uncertain clinical situation we might face. It is time we embrace clinical innovations in terms of vacuum extractors should an uncertain scenario arise.

Parallel to the trend at the central level, peripheral health workers must be equipped with all three domains of learning. This can be achieved with revision of midwifery curriculum for health workers and interns and revival of clinical mentorship and competency-based training program. Central to this paradigm shift lies revision of the policy hindering the uptake of IVDs at the grass-root level. The success of reviving and sustaining the art of lifesaving IVDs will depend on the collective effort of the stakeholders: Jigme Dorji Wangchuck National Referral Hospital, Khesar Gyalpo University of Medical Sciences of Bhutan, Ministry of Health, and Bhutan Health and Medical Council.

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Ethical Approval

The hospital does not need ethical approval in writing a review manuscript.

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