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Review Article

Partograph Utilization and Clinical Decision Making: A Veritable Tool in Reducing Maternal Mortality in the 21st Century

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Abstract

In Sub-Saharan Africa, prolonged and/or obstructed labour has been documented to be among the five most common causes of maternal mortality. It is responsible for 13% of maternal mortality worldwide, which could be avoided by using a partograph during labour in conjunction with quick referral and necessary surgical interventions. The intrapartum usage of the partograph by obstetrics caregivers plays a dominant role in recognizing any deviation from the norm. According to the World Health Organization (WHO), labour can be effectively monitored and complications prevented when this affordable instrument is methodically used with specific management standards. Despite the numerous benefits of partograph, some evidences suggested that insufficient care in labour is linked to incongruent use and health provider experience.

The purpose of this article is to examine important literatures on partograph in relation to prevention of obstructed labour, WHO resolution on modified partograph, and implementation of Labour Care Guide, as well as clinical decision-making. Relevant information were obtained from databases such as PUBMED, MESH MEDLINE and CINAHL among others.

Overall, it was noted that educating caregivers at all levels about proper partograph usage and interpretation, particularly the implementation of the labour care guide, would promote prompt and appropriate clinical decision-making, strengthen the referral system, and reduce maternal mortality.

Keywords: *Clinical Decision Making; Labour Care Guide; Maternal Mortality; Labour; Partograph*

Introduction

Maternal mortality has been linked to delays in diagnosing and treating life-threatening conditions, as well as substandard care. During labour, partographs are used to provide a graphical summary of the parturients' progress in labour and cervical dilatation pattern in the early stage of labour, as well as to warn clinicians about imminent dangers that will necessitate early intervention [1]. It has been reported that intrapartum partograph usage by caregivers is critical in the early identification of potential problems and variations from the norm during labour, resulting in timely and successful intervention and/or referral - a step that is critical in improving the maternal outcome and lowering maternal mortality or morbidity [2].

Both maternal and fetal parts of the partograph provide substantial information on the progress of the labour and the well-being of the fetus thereby initiating necessary measures to avoid unnecessary delay and portraying an important easily adaptable tool for reducing maternal mortality. Despite the demonstrated benefits of partograph, most low and middle-income countries (LMICs) have struggled to apply this labour tool [3]. The poor quality of intrapartum and infant care in Sub-Saharan Africa is well documented and Fisseha et al, 2019 recently reported that this could also be linked to the health practitioners' inexperience with appropriate use and interpretation of warning signs from the partograph [4].

Nigeria remains among the six nations with significant contribution to the global maternal mortality ratio [5] and in which prolonged and/or obstructed labour is an identifiable primary cause aside haemorrhage and hypertensive disorders [6]. In achieving the Sustainable Development Goal 3, it is paramount to ensure that the various evidences and World Health Organization (WHO) recommendations on the correct use of partograph to prevent maternal deaths from obstructed labour are duly incorporated into the schedules of all three tiers of health facilities [7]. Supporting health workers at Primary Health Care facilities to understand and act appropriately on the partographic findings as well as enhancing referral systems are essential to guarantee that women in labour receive the timely, high-quality care needed for them to survive along with their babies [8].

Obstructed labour and maternal morbidity/mortality

In 2017, the WHO estimated that over 295,000 women died during pregnancy and delivery, with 94% of the deaths occurring in low-resource settings. Even though the majority of these deaths were avoidable, two-thirds of global maternal deaths (196,000) occurred in Sub-Saharan Africa [9]. The WHO defines obstructed labour (OL) as an absolute halt in the progress of labour despite regular, adequate uterine contractions, characterised by progressively worsening caput and moulding due to mechanical factors thereby making vaginal delivery difficult or impossible. Globally, it affects about 5% of pregnancies and accounts for 2.8 percent of all maternal deaths, with the majority of these deaths occurring in underdeveloped countries. OL is an important public health issue that continues to be a major source of maternal and perinatal mortality and morbidity in both the short and long term. Furthermore, it is well known to be a significant economic burden and the leading cause of maternal death in developing nations, as opposed to industrialized countries, where it has a minor impact on maternal mortality [10].

Apart from maternal deaths, OL has been associated with a variety of maternal outcomes such as postpartum hemorrhage (PPH), ruptured uteri, infections, fistulae, postpartum depression, bladder injuries, and perineal tear as well as fetal outcomes such as stillbirth, asphyxia, meconium aspiration syndrome, neonatal sepsis, jaundice, and increased neonatal intensive care unit's (NICU) admission.

Overview of partograph

A partograph, according to the WHO, is a graphical record of observations conducted on women in labour for the progress of labour and significant circumstances of the mother and fetus plotted against time. It is a must-have tool for health experts who want to spot pathological or unhealthy labour. It aids in the early detection of difficulties during childbirth and guides decisions on how to proceed. The partograph is a printed chart with information on the fetal heart rate (FHR), the state of the membranes, the colour of the liquor, uterine contraction, cervical dilatation and descent of the presenting part as well as medications and fluids being used, and other crucial information provided on it without lengthy descriptive notes. Recognition and application of this basic tool necessitate optimal interventional measures that include training, retraining, and ongoing professional education programs to further empower practitioners in safe motherhood practices. In the early diagnosis of cephalopelvic disproportion, the partograph serves as an "alert system." As a result, it could help with referral decisions in remote health centers, hospital management decisions, and continuous assessment of treatment efficacy [11].

Partograph's goals: The goals of partograph included, but were not limited to, rapid identification of unexpected labour progress, preparedness during a prolonged labour condition, aiding in early action on labour transfer, strengthening, and/or revocation by recognizing cephalopelvic disproportion anytime there is obstructed labour and enhance the quality and predictability of all observational data of mother and fetus.

Partograph principles: The active phase of labour begins at either 3cm or 4cm cervical dilatation and the latent phase of labour should not last more than 8 hours. During the active labour, the rate of cervical dilation should never be shorter than 1cm/hour, furthermore, a four-hour time lag between a reduction in the rate of labour and the need for treatment is less likely to compromise the mother or the baby thus reducing the rate of unnecessary interventions. Vaginal examinations should be done four-hourly.

Partograph procedures: Firstly, ensure an accurate record of the patient's identifying details and pre-pregnancy summary as well as events surrounding the onset of labour. Then, record the (FHR) in the assigned space half-hourly. Note in the appropriate segment whether the fetal membranes were intact or not and the colour of the amniotic fluid if the membranes were ruptured. The degree of overlap of the skull bones, if any (moulding) should be carefully considered and documented. These parameters will be represented as "X" for cervical dilatation or "O" for descent of the presenting part at first and every 4 hours thereafter. Properties of the mother's urine such as protein, acetone, and volume also needed to be noted.

Evolutions of partograph

For nearly half a century, the partograph has been considered as part of the evaluation of labour advancement around the world. In the early 1990s, the WHO endorsed it as a standard method for reporting labour progress. Despite its wide popularity, it has been documented that utilization and correct completion rates were as low as 31% and 3% respectively [12]. In the year 2000, the WHO reviewed the partograph to make it more user-friendly such that the latent phase was abolished and plotting on the partograph commences when the cervical os is adjudged to be at least 4cm dilated. In 2018, the WHO updated its global recommendations on intrapartum care and thereafter began a process to reevaluate the partograph in view of available newer information such as better understanding of the individual variability of labour advancement that leads to good birth outcomes [13]. More specifically, the rate threshold of 1 cm/hour for cervical dilatation during active first stage (as depicted by the partograph alert line) is less accurate in identifying women at risk of pregnancy complications. As a result, spontaneous labour may not begin until a cervical dilatation threshold of 5 cm is met. There were no convincing evidences to support the use of 1cm per hour for cervical dilatation rate for predicting unfavourable labour outcomes [14,15]. The introduction of the WHO Labour Care Guide (LCG), a new labour monitoring tool, was thus based on increasing knowledge of normal labour progression while the recommendations are guided by the global movement towards improving the maternal experience of childbirth. The LCG has been dubbed the "next generation partograph" and it replaces the classic WHO partograph - a labour-tracking tool that is currently out of date in terms of labour duration, clinical intervention triggers, and the value of respectful maternity care. The LCG was created to help women and their newborns have a better delivery experience, as well as to ensure their health and well-being. It broadens the scope of labour monitoring to include non-clinical methods that help all women and babies have a pleasant delivery experience. The new WHO LCG strengthens women's relationships with their healthcare providers during labour and childbirth, improving both individual experience and clinical outcome, hence, becoming a practical tool for a new era of maternal healthcare, where women's values and preferences are at the center of their care [14].

The WHO LCG is unlike the previous partograph design in terms of its approach to labour, duration, intervention prompts, and emphasis on respectful maternity care. However, adapting to new changes in the health system can be difficult, and anecdotal evidence suggests that the effectiveness of the LCG over a conventional partograph should be established as soon as possible, or most systems will be doing more harm than good, and if care is not taken, most systems will collapse [16]. It is believed that WHO would still need to conduct studies on the awareness, acceptance, and effectiveness of the LCG at the three tiers of the health system, particularly in Sub-Saharan Africa, where rapid interventions and appropriate referrals are required.

The LCG is divided into seven sections and each of which was derived from the previous partograph design. The first section shows information of the patient and labour features at the time of admission while the second section shows the supportive care provided. The third provides information on the condition of the fetus and the fourth on the woman's health. Information on the labour progress and medications given are provided in the fifth and sixth sections respectively. The seventh section shows effort on the collaborative decision-making [17].

Aims of the LCG: The aims of the LCG are to ensure the monitoring and documentation of women's and babies' well-being, as well as the progress of labour. It is also expected to assist medical workers in providing supportive care to women during labour thus ensuring a happy delivery experience. LCG also provides reference thresholds for labour observations to help healthcare providers quickly recognize and handle emergent labour problems. It prevents the use of unnecessary interventions during labour while also assisting with labour management audits and quality improvement.

Key similarities and variations between the labour care guide and the modified WHO Partograph?

Both instruments show the progression of labour in terms of women's cervical dilatation and descent of the fetal presenting part per time. They also have sections that reveal regular recordings of crucial clinical measures reflecting the woman's and baby's well-beings. However, notable modifications on the partograph seen in LCG include the shift of onset of the active phase to 5cm cervical dilatation as against the previous 4 cm. Moreover, the LCG emphasized second-stage monitoring unlike the modified partograph. There are information on supportive care offered to women in labour on LCG unlike the modified partograph which has no record of supportive care and interventions. Furthermore, the LCG explicitly records labour companionship, pain treatment, oral fluid intake, and posture. With the exception of cervical dilatation, alert and action lines in the modified partograph, there is no explicit indicator to respond to deviations from expected observations of any labour parameter. However, the LCG highlighted deviations from normal and requires the corresponding response to be recorded by the provider. Moreover, the traditional partograph considered the strength and the duration of each uterine contraction as well as their frequency but the LCG just records the duration and frequency as the strength is believed to be embedded in the duration [16].

Usefulness of the partograph

It utilizes a simple, inexpensive, and reliable principle of graphical presentation of information on labour activities and progress which can easily be interpreted with a glance on a single sheet.

In addition, aside from showing the pattern of cervical dilatation, the partograph includes observations on effacement, descent of the presenting part, and the intensities/duration of uterine contractions, hence helping the healthcare provider to have a simplified handover process while removing undue ambiguity in taking decisions for interventions or referrals [7].

The partograph provides the opportunity for simultaneous recording of both the fetal parameters such as FHR, baby's position, and presenting part as well as maternal baseline data such as age and parity; vital signs such as temperature, pulse, and blood pressure; medications (including pain control) as well as fluid input and output [7].

Challenges of using the partograph

Partograph relies on trained midwives and obstetricians for its effective utilization and interpretation. Similarly, it necessitates the involvement of a trained healthcare professional to fill out and interpret the partograph and sometimes subjective differences exist in clinical findings while the clinician's autonomy is eroded.

Another major challenge is that the partograph assumes that all women in labour advance at the same rate and this has a significant impact on the rate of intervention. Cervical dilatation over time is a poor predictor of severe unfavourable birth outcomes [15].

In low-resource situations, lack of requisite resources and poor capacity building remain among the major reasons for low utilization of the partograph. Most facilities, particularly those in distant locations from the teaching hospitals, where it should provide the greatest benefits, fail to use partograph thus making it difficult to determine the effectiveness of the process of their clinical decision-making and judgment [8]. These challenges are illustrated in figure 1.

Figure 1: *Challenges associated with the use of partograph.*

Clinical decision-making and partographs: The nexus

Clinical decision-making, (CDM), a model described by Watters et al, 2014 [19], is a dynamic, ongoing process that involves gathering, interpreting, and reviewing information in order to make a scientifically proven conclusion and/or intervention. It is a specialized process that combines understanding of pre-existing pathological problems, explicit patient information, professional care, and experiential learning. Adverse obstetric outcomes are frequently due to poor decision-making and thus, having a clear and distinct grasp of the clinical decision-making process such as appropriate, persistent use of partograph (which has been shown to be beneficial to Obstetrics practice), will contribute positively to preventing adverse fetomaternal outcomes. Considering the relevance of partograph as a clinical management tool in low-resource settings, the International Confederation of Midwives (ICM) has included its knowledge and usage as a fundamental skill for midwives [18]. By establishing that labour is properly observed and life-threatening issues such as obstructed labour are diagnosed early and adequately managed, appropriate use of the partograph in conjunction with competent CDM process thus have the potential to save the lives of mothers and their babies.

Application of clinical decision-making (CDM) model to partograph use: The intrapartum period is perhaps the most critical time in the Obstetrics practice when both mother and child are at a high risk of morbidity and mortality. The ability of healthcare providers to

recognize early deviations from the norm is essential to patient survival. Figure 2 demonstrates that decision-making in clinical practice is a continuous, cyclical process that involves a cognitive continuum from the sub-conscious to analytical decision-making in a West-East fashion as well as from clinical data to the current status of the patient (North-South). Expert clinicians' decision-making is frequently so automatic that many are unaware of its complexity just as the use of partograph in labour which, based on the practitioner's experience, could reveal a novice or an expert. This model depicts CDM as occurring between a highly experienced clinician, an expert decision-maker, and a novice where the difference is the extent to which each provider can interpret available information and promptly recognize deviations from the norm while remaining confident in their ability to continue using the partograph. Thorough and careful use of the partograph has the benefit of reducing the cognitive load (information that the provider may need to consciously think about), allowing more time for recognizing and anticipating normal labour. This must be done in a way that consistently produces a decision that is in line with current evidence-based practice.

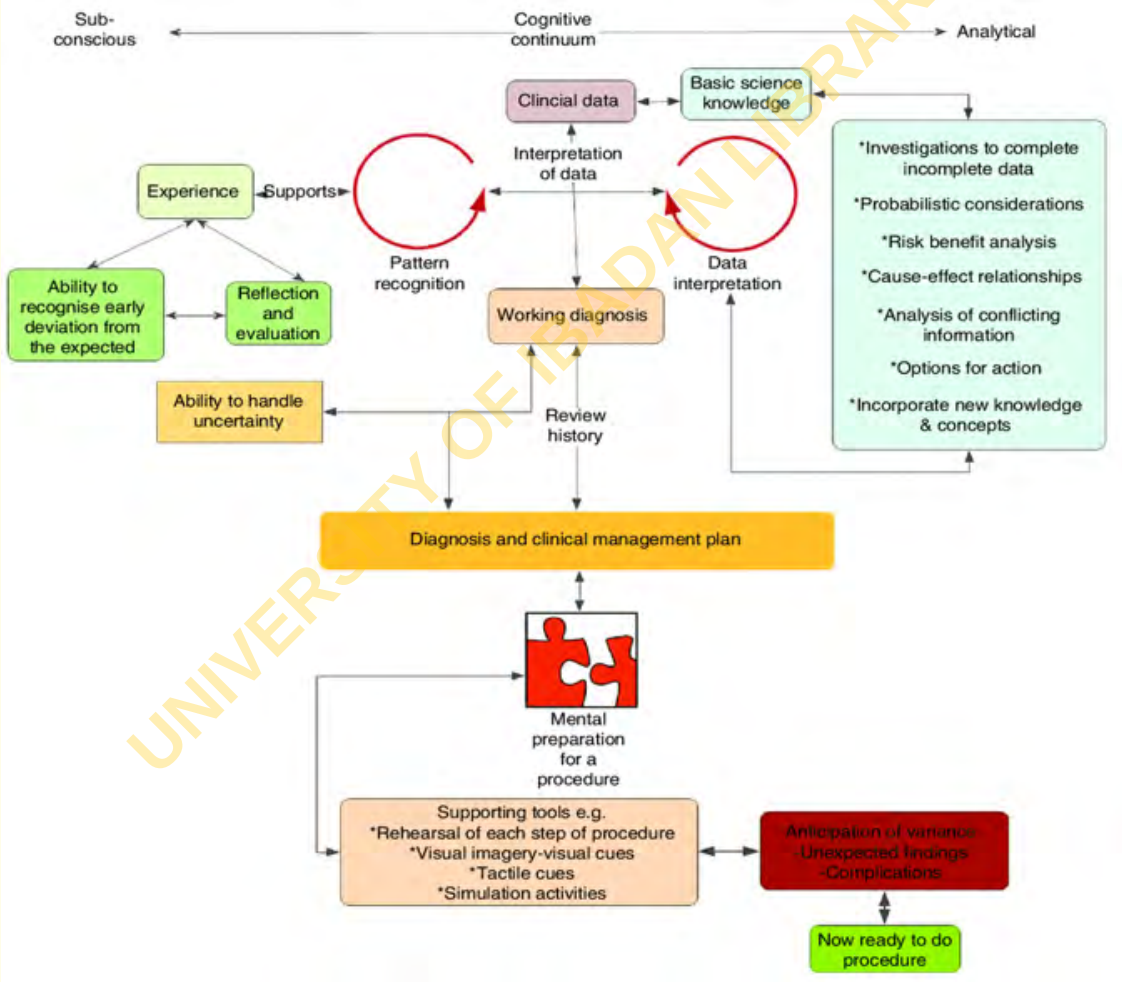

Figure 2: *Clinical decision-making (CDM) model [19]*

The model also showed that clinical data from the patients and pattern of care are governed by the providers' experience, which in turn determines their capacity to notice early deviations from the expected followed by prompt evaluation of the care being provided. An experienced provider will assess personal capability of handling the scenario and will decide on the best diagnosis and clinical management for the patient. When a patient's condition precludes the use of a partograph or when providers anticipate complications early enough, the patient is often scheduled for an urgent or emergency caesarean delivery in facilities with requisite requirements for such intervention. Therefore, any woman who is experiencing complications during labour and delivery will benefit tremendously from CDM and timely referral as these are critical to her survival by reducing delays that may be encountered in accessing appropriate, high quality care [20].

Meeting of the international confederation of midwives congress 2014 on partograph

At the International Confederation of Midwives (ICM) congress in 2014 and based on the conclusions of the 'Realist Review' as well as the Midwives' survey, a meeting was organized with the purpose of creating a consensus on future research, teaching, and practice priorities for effective implementation of the partograph. Despite various suggestions for partograph as a useful labour management tool, the ICM concluded that an enabling environment is required for effective labour progress monitoring and developed an evaluative evidence framework with five ideas connected to the enabling environment**:** (i) Acceptability of healthcare workers; (ii) Support for the healthcare system; (iii) Referral networks that work; (iv) Personnel; and (v) Competence of healthcare providers (Figure 3).

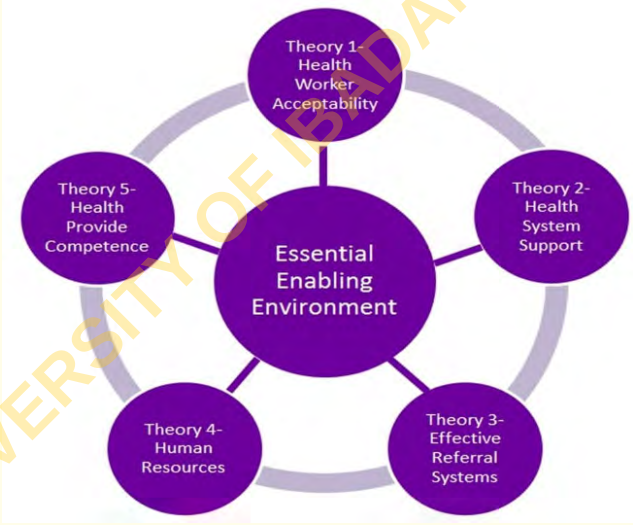

Figure 3: *Enabling environment theories [21].*

Consequently, these five theories are expected to be carefully evaluated at all levels in order for partograph to be viable. Moreover, all participants agreed that the partograph is critical for labour monitoring and decision-making in low-resource settings, while also acknowledging that health-system assistance is required at all levels to operationalize the partograph [21]. As a result, partograph could only be used as a decision-making tool and its worth meaningfully assessed within the context of a well-functioning district health system that includes all necessary components expected of the continuum of treatment. The referral systems within the continuum of care need to be structurally effective in order to ensure that supervised, quality care is delivered at all levels.

Implications for practice

The partograph is both simple to use and cost-effective while having a high potential for early detection of potential obstetric complications. It also has an impact on intrapartum care quality, maternal health, and birth outcomes as early decisions makes it easier to refer appropriate cases to higher-level facilities with emergency obstetric care signal functions. Subsequently, it would be highly important for program designers and policymakers to design and implement practical steps for the mandatory use of partograph, particularly at the primary healthcare levels, for effective labour management.

Summary and Conclusion

The LCG is intended to emphasize the experiential aspect of labour by demanding specific recording of evidence-based practices that are important not only for women's happy birth experiences but also for improving clinical outcomes for mothers and their newborns. The partograph is no substitute for proper screening of women in labour so as to exclude clinical conditions that may require prompt/emergency attention and/or transfer /referrals. A well-designed prospective research into the partograph's acceptance, implementation, and impact on intrapartum care and outcomes, as well as women's experiences with care, will provide evidence for decision-making in clinical practice. It is also hoped that the LCG will reflect most of the challenges identified in the old partograph and encourage best practices, such as the promotion of high-quality, respectful, and compassionate care for all women, newborns, and their families. Periodic training of staff, improving the number of personnel, making the partographs available in the labour wards, as well as a mandatory institutional policy all have the potential to improve the use of this labour-monitoring instrument and thereby reduce adverse fetomaternal outcomes especially when duly combined with appropriate clinical decision-making skills [22-24].

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