



Invited Editorial

Induction of labour in low- and middle-income countries: Challenges and measures to improve outcomes



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1. Introduction

The World Health Organization estimated in 2019 that in high-income countries, as many as one in 10 patients is harmed while receiving hospital treatment [1]. The harm can be caused by a range of adverse events, with nearly 50% of them considered preventable. Furthermore, the same report estimates that 134 million adverse events occur each year due to unsafe care in hospitals in low- and middle-income countries (LMICs). This is a major concern in pregnancy because both the mother and the fetus may be harmed. The adverse event may occur during an obstetric intervention such as induction of labour (IOL). A range of adverse pregnancy outcomes such as stillbirth, low birth weight, admission to neonatal intensive-care units, peripartum hysterectomy and neonatal encephalopathy have been associated with medically indicated IOL in LMICs [2,3]. Therefore, IOL should be undertaken only when the benefits of early delivery outweigh the risks of continuing the pregnancy. However, IOL should be undertaken as soon as it is deemed necessary, regardless of time of day or day of the week, as waiting could lead to fetal demise. Understandably, the fetal and maternal complications of IOL in LMICs are not always elevated [2] but the outcomes may nonetheless be improved. This is of particular importance given that the rates of perinatal asphyxia associated with neonatal encephalopathy are typically higher in LMICs than in high-income countries [4].

Certain challenges, because of their frequency of occurrence and association with complications of IOL in LMICs, are key in determining the outcomes of IOL. These challenges include delays in patients accessing appropriate levels of care (due to issues such as transportation difficulty), inability to afford the fees for obstetric care, unavailability of a variety of medications for the procedure, difficulty in storage of some of the medications, poor patient monitoring (emanating from insufficient equipment, hospital bed spaces and experienced medical staff), poor

access to safe caesarean delivery, political unrest, and traditional beliefs (including failure of patients to return for scheduled IOL and ingestion of traditional medicines). This editorial discusses these challenges and measures to improve safety for the mother and baby.

2. Challenges and measures to improve outcomes

Ineffective triage and delays in the transportation of patients to higher levels of health care is a major challenge in LMICs. To address this challenge, a successful triage system [5] may be adopted by health care facilities. Quality improvement projects to identify gaps in triage, followed by a workshop and implementation of the knowledge learnt has reduced patients' waiting time in a busy maternity unit in one LMIC [5]. This strategy can be improved further by using an obstetric triage algorithm. The Association of Women's Health, Obstetric and Neonatal Nurses' Maternal-Fetal triage algorithm is available for adoption by health care facilities [6]. Each health facility should develop a triage system to identify high-risk patients and establish a route for referral of patients to a higher level of care for IOL.

Political unrest and poor road conditions in some LMICs complicate the situation. In addition, some women who arrive at the health facility are occasionally unable to afford the fees for obstetric care. In these settings, many facilities lack modern equipment such as ultrasound machines and cardiocograms for electronic fetal monitoring. Ultrasonography also provides benefits such as confirmation of fetal presentation, placental localization and pregnancy dating. Neonatal care facilities are also often inadequate. The main solution to the political instability, unaffordable medical fees, and inadequate equipment and infrastructure is for the stakeholders to provide and support leadership that is selfless, fair, visionary and performance-driven, and that upholds quality.

Patient factors such as the ingestion of traditional medicines to purportedly improve pregnancy outcomes have been reported and such factors have been associated with fetal compromise in LMICs [7]. Furthermore, traditional medicines may interact with the induction agents and complicate IOL. Some women do not return for their scheduled IOL for a number of reasons, such as a preference for spontaneous labour, spousal influence and bad experience with a previous IOL [8]. This highlights the challenge of appropriate information sharing and counselling in LMICs, where there are large numbers of patients in under-staffed primary care clinics and district/level 1 hospitals. Each health district should provide community health education on the importance of regular antenatal clinic visits by pregnant women and the need to avoid unsafe health practices. The International Federation of Gynecology and Obstetrics has made recommendations about the minimum number of staff and delivery rooms required in LMICs [9], and efforts must be made to attain or exceed these requirements through improved economic policy, financial discipline and accountability. It is also important to provide an effective communication system through which to obtain emergency advice from a clinician experienced in obstetric care.

To illustrate the challenges of insufficient hospital bed space, Ngene et al., 2014 reported how a pregnant inpatient sustained a needlestick injury due to hospital overcrowding while waiting for IOL [10]. This resulted in both the mother and the baby needing HIV post-exposure prophylaxis because the source needle had been exposed to HIV [10].

The non-availability of a variety of medications for IOL and the difficulty in their proper storage are also realities in LMICs. The solution to this challenge includes the use of other effective methods of induction and strategies that improve the success rate. These suggested measures should be included in the facility's protocol on IOL. Many methods of IOL are used in LMICs but amongst the commonest are prostaglandin and its analogue, Foley catheter, oxytocin and amniotomy; and these may be preceded by fetal membrane sweeping. Unlike oxytocin, misoprostol is cheap and can be stored at room temperature (it does not require refrigeration), although it may increase the risk of uterine hyperstimulation, particularly if used in high doses. Misoprostol results in delivery within 24 h of IOL in 74% of patients in LMICs [11]. This is comparable to the 74.7% success rate reported in a high-income country [12]. The same study in a high-income country showed that both misoprostol and Foley catheter IOL are comparable in effectiveness and safety [12]. Therefore, the use of misoprostol in LMICs is acceptable in the absence of contraindications such as advanced pregnancy combined with previous major uterine surgery. Foley catheter IOL may be used in the management of pregnancy at increased risk of uterine rupture such as grand multiparity. On the other hand, amniotomy and/or oxytocin are typically indicated in those with ripe cervix (Bishop score ≥ 6). Of note, a Bishop score of ≥ 6 favours successful vaginal delivery. In obese women, a model available at <https://ob.tools/obesity-iol-calc> that includes maternal demography shows promise for successful prediction of vaginal delivery following IOL with an area under receiver operating characteristic curve of 0.79 (95% CI 0.78–0.79) [13]; and it is hoped that such a tool will demonstrate acceptable diagnostic accuracy in LMICs. To improve the chances of vaginal delivery after IOL, an additional cycle of the same prostaglandin, a different prostaglandin or combined methods (such as misoprostol and intra-cervical Foley catheter) may be attempted in a healthy woman with a satisfactory fetal condition, before declaring the procedure a failure. Although these strategies improve vaginal delivery in the author's practice, their outcomes have not been fully investigated. Understandably, there is heterogeneity in the definition of failed IOL [14]. Importantly, women undergoing IOL should be classified into groups to assist with the analysis of outcomes and comparison with practices elsewhere.

Some women will require caesarean delivery (CD) after IOL, for a number of reasons. In some facilities, there is poor access to safe CD, for example because no operating room is available close to the labour ward to aid a timely surgical delivery. A meta-analysis by Woods et al., 2014 showed that IOL was associated with a reduction in CD rate and

a non-statistically significant decrease in perinatal deaths [15]. However, a 2016 meta-analysis of individual patient data by Walker et al. demonstrated that IOL has no effect on the CD rate in women with advanced maternal age [16].

One challenge concerning CD is the avoidance of intraoperative and immediate postpartum complications, as highlighted in the Saving Mothers 2017: Annual Report on Confidential Inquiries into Maternal Death in South Africa [17]. That report stated that managers should ensure that the recommended safe CD tool-kit (known as "Minimum Standards for Safe Caesarean Section") is utilized to improve the outcomes of CD in their hospitals. The tool-kit includes the training that a medical doctor needs to undergo before performing a CD, as well as the staff, equipment and drugs ideally available to ensure safe operative deliveries. This package for safe CD care has contributed to a decline in the complications of CD in South Africa [18], and can be adapted for use in other LMICs.

3. Conclusion

Conditions in LMICs need to be improved and IOL should be performed only in care settings that have the capacity to monitor women and provide standard emergency obstetric care such as CD. Furthermore, regular obstetric training and clinical audit should be undertaken to monitor and improve the quality of care.

Contributors

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