Asma Ali - Centro universitario per la cooperazione internazionale - Università degli studi di Parma, Parma, Italy - Training Course in Sexual and Reproductive Health Research 2010

Bonventure Ameyo Masakhwe - Centro universitario per la cooperazione internazionale - Università degli studi di Parma, Parma, Italy - Training Course in Sexual and Reproductive Health Research 2010

WHO midwifery education module 3
Managing prolonged and obstructed labour

Asma Ali, Bonventure Ameyo Masakhwe

Kenya/University of Parma, Italy

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Introduction

Improving maternal health is the fifth Millennium Development Goal. This stems from the fact that to achieve general development in the society, one needs to be healthy right from the moment of the person's birth in order to be productive. However, the reproductive role of women can jeopardize their productive role and that of the babies they carry through complications of pregnancy and delivery process. With a current global maternal mortality ratio of 500/100000, reducing maternal mortality ratio is one of the ways of improving the health of mothers [1]. Obstructed labor is one of the biggest causes of maternal death and its prevention is what this guideline aims to teach.

Guideline summary

The guideline was developed by the WHO together with the International Convention of Midwives to be used by teachers of midwifery in addressing the question of obstructed-labor-related maternal deaths. It is just one amongst six modules addressing each of the major causes of maternal mortality. The guideline is therefore a tool of knowledge and skills transfer to midwives whose use is synergistic with the other modules in achieving target 5A of the MDGs.

The guideline starts with explaining the global burden of maternal mortality and therefore the rationale behind its development. The development process is outlined, including the developers involved (amongst them midwives of international repute), the targeted users (midwives and doctors), the testing process as well as appreciation of those who funded the project.

A how-to-use-the-guideline is laid down: materials and a mix of teaching methods in knowledge and skills transfer. Teaching aids include card-boards that can be used to simulate the maternal pelvis and fetal head, baby dolls and charts. Others like vacuum aspirators are to be used in the field with patients although acquaintance with their use before the practical session is prerequisite. Teaching methods include formal lectures, tutorials, question-answer sessions, discussions, role-plays, clinical practical sessions and community visits.

The module is divided into nine sessions. Each session begins with the aim, objectives, plan, instructions for the teacher and student and the resources to be utilized.

Session one starts with explanation of the difference between obstructed and prolonged labor. The P's of prolonged labor are a small passage (pelvis) relative to the passenger (baby) and power (poor contractions). Obstruction occurs when spontaneous delivery cannot be achieved. The causes include cephalo-pelvic disproportion, abnormal presentation or features of the fetus and abnormalities of the genital tract. The anatomy of the normal pelvis and its normal antero-posterior and transverse diameters are elucidated. The movement of the fetus during birth is described. The occiput-posterior presentation and brow presentations are some of the causes of labor prolongation or obstruction. The consequences of obstructed labor are uterine rapture, lactic acidosis of the mother, fistulae, deformity of fetal skull and death. Abnormal pelvises that can lead to obstruction are described.

Session two- Avoidable Factors. Though it is emphasized that every mother should be considered as being at risk of prolonged and obstructed labor, the session deals with factors that could predispose some women more than others. What is more, these are factors which are considered preventable in the long term such as proper nutrition and sun exposure in preventing

rickets and inherent pelvic deformities or in the short term by early referral such as in the case of previous Caesarian section. Identification of these factors by the student is crucial.

Session three focuses on identifying obstructed or prolonged labor in a woman and its management. Proper history, physical examination and the use of the partograph are invaluable in this respect. The history could help in identifying the risk factors as mentioned above. The physical examination gives the general condition of the mother and baby and the specific signs of obstructed labor on abdominal examination such as Bandl's ring. Vaginal examination could give additional information such as fowl- smelling meconium indicative of possible infection and inadequate cervical dilation. The partograph recordings relay information on how long the mother has been in labor, cervical dilation and fetal status etc. Plotting beyond the ALERT and ACTION lines are indicators that action should or should have been taken. The student should also be able to identify a ruptured uterus during this session, an ominous consequence of obstructed labor.

Session four- Prevention of Prolonged and Obstructed Labour. The partograph, each entry on it and its use are explained. Normally-progressing labor will have a plotting on the left of the alert line. Deviation to the right could signify prolonged labor. The mother is assessed for dehydration, a full urinary bladder which are some factors whose timely correction will return progress back on course. A plotting on the right of the action line indicates that immediate action is necessary. In resource-poor settings, referral to a higher level for management is made. The student is expected to acquire skills in measuring cervical dilatation and be able to plot information on a partograph through the case studies provided. Above all, drawing deductions from the partograph regarding prolonged or failure to progress in labor is of utmost importance and the interventions to institute. Therefore, the session concludes with case studies where the student plots a partograph using data provided on three women one with normal progression of labour, the second with prolonged and the last with obstructed labor.

Having already developed skills in identifying prolonged labor, session five teaches the student on the specific management of prolonged labor. A prolonged latent phase is diagnosed in retrospect. Therefore, if after eight hours the contractions seize and there is no cervical change, then false labor could be the diagnosis and the cause is followed. If however there is cervical changes after eight hours of reassessment induction is carried out. A mother with prolonged active phase is reassessed for uterine contractions and cephalo-pelvic disproportion and malpresentation. Augmentation with oxytocin in case of poor uterine contraction, urinary catheterization and rapture of membranes are possible interventions given cephalo-pelvic disproportion and malpresentation have been ruled out. Cesarean section is the intervention of choice in case of cephalo-pelvic disproportion. Augmentation is also instituted in prolonged expulsive phase, also provided malpresentation and obvious obstruction are ruled out. Depending on the station of the fetal head, in the event that augmentation fails, a choice is made between forceps delivery, symphysiotomy, vacuum extraction and referral for Cesarean section.

In section six, obstructed labor and antecedent events such as dehydration, infection and modes of delivery of the fetus are given focus. Management of labor by the midwife is done in close association with the doctor in circumventing the labor obstruction. The session gives infection prevention a keen look from hand washing to sterilization.

Session seven deals with clinical skill development in the learner on identifying a woman in prolonged or obstructed labor, diagnosis of position and presentation of the fetus through

abdominal examination (Leopold's maneuvers), pelvic assessment and vaginal examination. Thus, using sutures on the fetal head, the learner acquires competence in determining the position, and using the ischial spines, descent of the fetal head in the pelvis. Positions that might present obstruction include occiput-posterior and face presentations. Performing an episiotomy and other skills such as fixing of intravenous line, drawing blood samples and urinary bladder catheterization are also explained.

In the eighth session, vacuum extraction is demonstrated beginning with indications and contraindications and the technique itself. Lastly, session nine recommends the use of case studies in cementing all the sessions in the module.

Literature search

Relevant materials on obstructed labor were reviewed. Williams Obstetrics 22nd edition, based on its authoritativeness in evidence-based obstetric practice, was consulted for congruency of the clinical information presented in the guideline. Articles were retrieved from PubMed and Cochrane reviews. Guidelines and articles on obstructed labor in the context of Kenya were included. Though search results yielded little material in the specific environment of Kenya, articles on management of obstructed labor in other countries were found useful in reviewing evidence-based practice on the topic.

Between 15-30% of all deaths in reproductive age women are believed to be associated with pregnancy, labor, or the puerperium in most countries of Africa. The most important causes of maternal death are hemorrhage, sepsis, eclampsia, obstructed labor and uterine rupture. Other causes are pregnancy-induced hypertensive disease, puerperal sepsis, uterine rupture, anemia, infection, non-medical abortion and poor management of delivery. Factors tending to increase maternal death include obstructed labor, malnutrition, poverty, overwork, lack of primary health care, parasitic disease. These leads to also poor child outcomes, perinatal mortality, adverse neurodevelopmental disorders in children due to the related asphyxia and complicated labor. Cultural factors also promote maternal deaths in many areas, such as low status and neglect to girls and women, polygamy, early marriages and childbearing, underfeeding and dietary practices during pregnancy, and double standards of sexual ethics resulting in clandestine abortion or prepubertal marriage.

The topic of dystocia- which this document focuses on- has been widely tackled from different angles and by different authorities. How the topic is taught to those who are likely to chance upon this emergency has also been given emphasis. In a recent study in all the eight provinces in Kenya, provider(midwife)-training in life-saving skills within the past 1-2 years was associated with good quality care in the event that the provider encountered such an emergency[2]. Not only is training necessary but it should be attuned to transforming knowledge into practice through a mixture of effective training techniques. Using shoulder dystocia and eclampsia, a study in the US has shown that nurses and residents being trained in crisis management of labor and delivery could benefit more if simulation activities augmented the traditional didactic teaching [3].

A skilled birth attendant (SBA), as defined by the WHO, is proficiently trained to manage uncomplicated delivery as well as recognize potential maternal and newborn complications and hence institute necessary referral measures. In teaching the topic of obstructed labor, therefore, knowledge should be acquired by the trainees and simultaneous development of competency in

skills. However, there exists a stark difference between evidence-based standards and competency among midwives as was shown by a two-phased study conducted in Benin, Jamaica, Ecuador, Rwanda and Nicaragua. Participants scored lower on skills assessment than knowledge-based assessment. There were also differences among professional cadres with doctors and medical students scoring higher than nurses on aspects like use of the partograph [4,12]

Dystocia, simply put, means difficult labor. The causes, which may act singly or in combination, are:

- Abnormalities of expulsive forces- inadequate or uncoordinated uterine contractions and poor voluntary muscle effort
- Abnormal fetal presentation, position or development
- Abnormal maternal bony pelvis
- Abnormalities in soft tissues within the maternal pelvis that cause obstruction

Proper diagnosis of dystocia is as important as its early diagnosis and management, in a bid to reduce overdiagnosis and unnecessary Cesarean section. In developed countries where say Montevideo units can be used to measure the adequacy of uterine contractions, the partograph remains one of the most appropriate technologies in the developing world for intrapartum monitoring of labor. Though the WHO recommends consideration of prolonged labor if cervical dilatation is less than 1cm/hr for a minimum of 4 hours on the partograph, the American College of Obstetricians and Gynecologists appreciates differences between nulliparous and multiparous women in the rate of cervical dilation. It gives the rate as < 1.5cm/hr and <1.2cm/hr of cervical dilation for multiparous and nulliparous women respectively and <2cm/hr and <1cm/hr of descent for multiparous and nulliparous respectively [5].

Neglected obstructed labor is a major cause of both maternal and newborn morbidity and mortality. The obstruction can only be alleviated by means of an operative delivery, either Cesarean section or other instrumental delivery (forceps, vacuum extraction or symphysiotomy). Maternal complications include intrauterine infections following prolonged rupture of membranes, trauma to the bladder and/or rectum due to pressure from the fetal head or damage during delivery, and ruptured uterus with consequent hemorrhage, shock or even death. Trauma to the bladder during vaginal or instrumental delivery may lead to stress incontinence. By far the most severe and distressing long-term condition following obstructed labor is obstetric fistula - a hole which forms in the vaginal wall communicating into the bladder (vesico-vaginal fistula) or the rectum (recto-vaginal fistula) or both. In developing countries, fistulae are commonly the result of prolonged obstructed labor and follow pressure necrosis caused by impaction of the presenting part during difficult labor. Prevalence accounts to 2:1000 deliveries in Sub-Saharan Africa [6]. A lot is currently being done and resources put in projects dealing with fistula repairs, which could have been prevented. In the infant, neglected obstructed labor may cause asphyxia leading to stillbirth, brain damage or neonatal death.

Studies evaluating the effects of different interventions on maternal mortality are lacking in Africa [7], and of the few studies done and scientific suggestions concluded that the best strategy for reducing maternal mortality in sub-Saharan Africa would involve providing better health

services, upgrading nursing and midwifery skills, training traditional birth attendants to improve their practical skills and eliminate harmful practices, and providing family planning programs.

Other studies have shown the importance of simple tools like maternal anthropometry [8] as an excellent predictor of poor pregnancy outcomes, in which if known earlier can be prevented by early interventions.

A study to identify and quantify risk factors for perinatal mortality in a Kenyan district hospital and to assess the proportion of perinatal deaths attributable to labor complications, maternal undernutrition, malaria, anemia and human immunodeficiency virus (HIV) showed that the perinatal mortality rate was 118 per 1000 births [9]. Complications of labor such as hemorrhage, premature rupture of membranes/premature labor, and obstructed labor/ malpresentation increased the risk of death between 8- and 62-fold, and 53% of all perinatal deaths were attributable to labor complications. Placental malaria and maternal HIV, on the other hand, were not associated with perinatal mortality and concluded that greater attention needs to be given to the quality of obstetric care provided in the rural district-hospital setting.

Other programs like the Safe Motherhood programs in Kenya [10] are training mid-level providers to manage the complications of unsafe abortion to increase women's access to post abortion care.

Criteria-based audit [11,13] can improve the quality of professional practice. Criteria-based audit is strongly supported by expert opinion as well as national and international organizations including the World Health Organization and the National Institute of Clinical Excellence (NICE) in the United Kingdom. The criteria-based audit consists of five steps which constitute the classic audit cycle (Fig1). The first step is the development of standards. Once standards have been developed, current practice is measured and compared with standards (optimal practice). Gaps in current practice are identified, recommendations made and implemented, and progress is evaluated. This approach is currently supported in Kenya, Malawi and other countries in Africa. It is an important tool in emergency obstetric care.

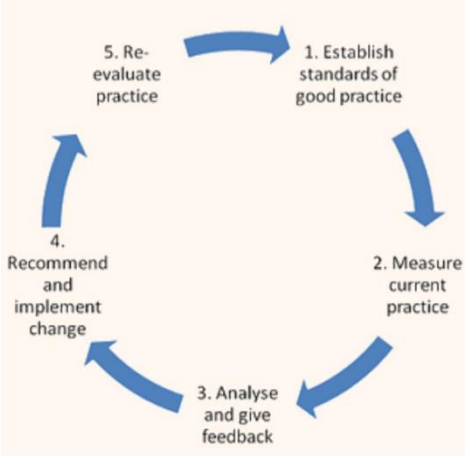

Figure 1

Guideline appraisal

Scope and purpose

The main objective of the guideline is to enhance teaching of the topic of dystocia in tackling one of the major causes of maternal deaths- obstructed labor. The guideline is therefore meant to be used by teachers of midwifery in cascading the knowledge to midwives, nurse-midwives and improving the midwifery skills of other health professionals.

The question of managing prolonged and obstructed labor and the modules to be used for the training of nurses and midwives had been well covered by the guideline, however the guideline is very restricted and shows no scientific evidence on why one has to apply such interventions. Never the less, it has focused on practical management of prolonged and obstructed labor which in fact, should have been prevented if the mother was assessed well and followed up during her pregnancy period, and not to be identified when the problem has occurred, as this will increase the mortality and morbidity if immediate referral and interventions are not achieved urgently. This situation should only be expected when the mother arrives for medical services later when problems have set in.

Understanding the concept and principles of using the partograph in the prevention of prolonged and obstructed labor and to apply this understanding in practice and to become increasingly skilled in assessing the progress of labor is the initial and critical part of the management.

The WHO modified partogram is a simple tool designed to help in labor monitoring and detection of problems during labor. The new WHO partograph has been modified and revised to make it easier to use. The latent phase has been removed, and plotting on the partograph begins in the active phase when the cervix is 4 cm dilated. The removal of latent phase on the Partogram was not scientifically explained and the reasons not well defined. The latent phase of labor is an important early predictor of complications in the other stages of labor, and if not monitored, might led to the late identifications of problems in the progression of labor.

As the latent phase will mainly be focusing on childbirth pain and lamazing, it is an important phase which should be monitored, if not in the partogram then there should be a tool for pain and latent phase monitoring. Midwives should be trained on lamazing techniques and should be able to involve the partners and other family members related to the laboring mother in this activity.

The interventions mentions in the module like use of vacuum are not a common practice especially in rural and district setups in most of the hospitals in Africa. Moreover, it only focused on the use of partograph as the tool of labor assessment, which is practically less sensitive in detection of prolonged and obstructed labor, as it depends on the user skills and accuracy.

Regarding vacuum delivery, though the guideline recommends use of stepwise increase in negative pressure from 0.2kg/m^2 till 0.8 kg/m^2 for the fear of increased detachment rate, perineal tears and injury to the fetal head, a Cochrane review revealed that rapid increase in negative pressure reduced the delivery time with no significant differences in outcome in comparison to stepwise increment [15]. Another Cochrane review distinguished the benefit of metallic caps over soft caps in delivery of occiput-posterior, transverse and difficult occiput-anterior positions, while soft caps were more suitable for more straight foreword deliveries [16]. The guideline has however not recommended the choice of caps.

Stakeholder involvement

The guideline was developed by the WHO together with the International Convention of Midwives and American College of Nurse-Midwives to be used by teachers of midwifery in addressing the question of obstructed-labor- related maternal deaths. It is worth noting that the development of the draft module and field-testing tool were each developed by one person, and though the testing was initially done in two African countries, it is not clear whether the two were pretty familiar with obstetric practice in the African context. A top-down approach therefore seems to have been used without consultation of field-based midwives, or at least that was not mentioned.

As mentioned earlier, the guideline underwent field testing in only 2 African countries which ideally is not enough to make it a as a practical guide in the whole of Africa. More participatory research and piloting target groups should be undertaken to show an evidence based significance of the guideline

Guideline development

The document has not mentioned any research evidence approaches and no scientific backgrounds. It is therefore not mentioned if systematic methods were used to search for evidence. Apart from the fielding-testing phase and later the refinement of the initial draft, no other methods for formulating recommendations are explained.

The risks of clinical procedures covered by the guideline have been discussed. The risks of vacuum delivery and precautions to be taken have been explained. The same applies to episiotomy. However, forceps delivery, recommended in the guideline, was not explained both the procedure, indications and benefits/risks over vacuum delivery.

Though it is the second edition in part of a series, the procedure for upgrading from the first to the second as well as the next was not explained. Nevertheless, it was made in a very simple and systematic approach which is an advantage in a way that it is easier to be used in training the specific target group of midwives and nurses. It is practical and shows how to use the skills defined in a real situation. It is also supported by tools for application which includes instructions for the teacher and learner, questions and other learning materials such as paper boxes and dolls. Case studies are invaluable tools.

Applicability in our professional environment (Kenya)

The guidelines are well known in our professional environment, and are practiced in most health centers. The drawback is that it is mostly applicable only in rural health centers and in some districts hospitals that do not have specialized Obstetricians, and where referral is not possible. Otherwise the interventions given by the guidelines are the only options to be taken when one has no alternative for surgical emergency or elective caesarian section in the management of obstructed labor.

Use of simple antibiotics in management of prolonged labor especially when the mother has had several vaginal examinations before arriving to the hospital, and after Cesarean section are common practice.

Almost all the guidelines given by WHO on the management of prolonged and obstructed labor are usually found to be very useful in the fact that, they are designed in a simple style and easy to

be understood. The information from the guidelines is usually made into protocols and flow charts that are much easier to understand and to be followed up in practical situations as in the maternity wards and delivery rooms.

However, in Kenya the Ministry of Health –Division of reproductive health has National guidelines formulated for use by National Reproductive health Research section [14]. The Guidelines usually include research based practices and in cooperating with other guidelines from other organizations like the WHO.

The important thing is to make sure that the guidelines are followed appropriately and at all times. To achieve this, there is need of frequent continuous medical education and in-service trainings especially to the nursing and midwifes concerned. The other important thing is to emphasize the need and the importance of identifying the problem. This means suspecting that the woman is in obstructed labor. If she is not, then the cause of the problem must be identified and managed accordingly and also to emphasize the aim of management, i.e. to save life and prevent further damage and to stress on the principles of management, especially the need to avoid unnecessary delay.

Conclusion

Management of obstructed and prolonged labor remains one of the important ways of reduction of maternal and perinatal mortality [9]. However as it is still very difficult and confusing in defining exactly what could be the proper description of obstruction during labor and its cause. Training the health care providers, nurses and midwifes in the best antenatal practices, monitoring of labor and early detection of labor complication could be the goal standard approach in attaining the reduction of maternal mortality and morbidity.

Health care systems in developing countries should be encouraged to have action plans focusing in the training and mentoring the midwives and other health care workers dealing with the pregnant mother. Support both technical and financial should be offered to developing countries health services to be able to achieve their action plans.

Finally, more participatory research should be carried out to conclude and prove the importance of training and use of specific interventions and guidelines in management of pregnancy related complications.

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