Nanna Maaløe et al.

Intrapartum clinical guidelines, United Republic of Tanzania

Local adaption of intrapartum clinical guidelines, United Republic of Tanzania

Nanna Maaløe,a Tarek Meguid,b Natasha Housseine,b Britt Pinkowski Tersbøl,a Karoline Kraglund Nielsen,c Ib Christian Bygbjerga & Jos van Roosmalend

a Global Health Section, Department of Public Health, University of Copenhagen, Øster Farimagsgade 5, Building 9, 1353 Copenhagen, Denmark.
b Mnazi Mmoja Hospital, Zanzibar, United Republic of Tanzania.
c Health Promotion Research, Steno Diabetes Center Copenhagen, Gentofte, Denmark.
d Athena Institute, Vrije Universiteit Amsterdam, Amsterdam, Netherlands.

Correspondence to Nanna Maaløe (email: nannam@sund.ku.dk).

(Submitted: 24 July 2018 – Revised version received: 6 December 2018 – Accepted: 1 March 2019 – Published online: 26 March 2019)

Abstract

Problem Gaps exist between internationally derived clinical guidelines on care at the time of birth and realistic best practices in busy, low-resource maternity units.

Approach In 2014–2018, we carried out the PartoMa study at Zanzibar’s tertiary hospital, United Republic of Tanzania. Working with local birth attendants and external experts, we created easy-to-use and locally achievable clinical guidelines and associated in-house training to assist birth attendants in intrapartum care.

Local setting Around 11,600 women gave birth annually in the hospital. Of the 35–40 birth attendants employed, each cared simultaneously for 3–6 women in labour. At baseline (1 October 2014 to 31 January 2015), there were 59 stillbirths per 1000 total births and 52 newborns with Apgar score 1–5 per 1000 live births. Externally derived clinical guidelines were available, but rarely used.

Relevant changes Staff attendance at the repeated trainings was good, despite seminars being outside working hours and without additional remuneration. Many birth attendants appreciated the intervention and were motivated to improve care. Improvements were found in knowledge, partograph skills and quality of care. After 12 intervention months, stillbirths had decreased 34% to 39 per 1000 total births, while newborns with Apgar score 1–5 halved to 28 per 1000 live births.

Lessons learnt After 4 years, birth attendants still express high demand for the intervention. The development of international, regional and national clinical guidelines targeted at low-resource maternity units needs to be better attuned to input from end-users and the local conditions, and thereby easier to use effectively.
Introduction

To end preventable deaths during birth, the production of clinical guidelines for low-resource settings is expanding. However, in many low- and middle-income countries, there are gaps between internationally derived clinical guidelines and realistic best practices. Therefore, guidelines tailored to local contexts are needed. We describe the PartoMa intervention study in Zanzibar, United Republic of Tanzania, for which a pocket guide on locally achievable maternity care was co-created with birth attendants. Examples of such adaptation and implementation of clinical guidelines in low-resource settings are scarce, both within and beyond maternal health.

Local setting

Mnazi Mmoja hospital is a low-resource tertiary hospital with a high burden of maternal and perinatal deaths. Around 11,500 women give birth annually in the hospital, with the great majority being self-referrals. At baseline (1 October 2014 to 31 January 2015), there were 59 stillbirths per 1000 total births and 52 newborns with Apgar score 1–5 per 1000 live births. The birth attendants are young, non-specialized nurse-midwives and doctors, and staff turnover is high. Two years after the start of the intervention, 9 of 11 doctors (82%) and 15 of 24 nurse-midwives (63%) in permanent positions were no longer working in the maternity unit. Each birth attendant cares for between three to six women in labour at the same time, with, typically, two women sharing each bed.

When starting the study in October 2014, different clinical guidelines on intrapartum care, including the World Health Organization’s (WHO’s) Guidelines for managing complications in pregnancy and childbirth, were available in the hospital, but rarely used.

Approach

The aim was to create locally achievable and easy-to-use guidelines to assist birth attendants in providing best possible intrapartum care with the constrained resources available. We adapted existing international guidelines, and we conducted systematic literature searches when we had to deviate from the recommendations to reach reality. Our modifications included reducing the frequency of clinical assessments, reducing the information load and avoiding ambiguity within recommendations (Box 1; Fig. 1). As described elsewhere, the development process included repeated reviews by local birth attendants and by a panel of external specialists in midwifery, obstetrics and neonatology with experience from low-resource settings. We applied three key principles: (i) guidelines for individual women should consider that each birth attendant cared for several women in labour simultaneously; (ii) basic and emergency obstetric care should be
integrated; and (iii) the WHO partograph should be emphasized as an early warning tool to assess maternal condition, fetal heart rate and progression throughout the latent and active phases of labour.

In addition to everyday use, training on the use of the pocket guide and partograph was provided during quarterly in-house seminars. We ran each 4-hour seminar twice to enable most staff to participate, and participants were invited to return for the following rounds of quarterly seminars. Participants included nurse midwives, doctors, assisting medical officers, clinical officers and students. Group sizes varied between five and 15, as no staff were refused access. No allowances were paid, but food, pocket guides and certificates of attendance were provided. The main focus was to strengthen critical clinical decision-making by use of the clinical guidelines, teamwork and triage as well as strengthening respectful caring support of women in labour. At each seminar, the groups rotated between five stations where real case stories from the hospital were discussed. The case stories differed between the quarterly seminar rounds to ensure relevance among returnees, but one station always focused on triage and the others on individual case stories. The facilitators were experienced birth attendants, predominantly from the hospital.

In response to birth attendants’ comments, we launched an expanded second version of the pocket guide in 2018. Though the official work language is English, we are currently translating the guide into Swahili, which might strengthen use further.

Relevant changes
We evaluated the programme using Kirkpatrick’s four-level framework. Level 1 was staff perceptions, which we evaluated throughout the four years. Since January 2015, 16 seminar rounds have been conducted at the hospital. During the first 12 rounds, an average of 67 birth attendants (range: 45–120) participated in each round, with approximately 40% returnees. From the hospital’s maternity unit, an average of 7 doctors (64%) and 15 nurse midwives (62%) attended each time, as well as nearly all intern doctors (range: 4–14). Additional participants came from other maternity units in Zanzibar. Among 532 participants who responded to anonymous seminar evaluation questionnaires, 484 (91%) would recommend the seminars to fellow birth attendants, 458 (86%) agreed that the case stories represented familiar clinical situations and 484 (91%) believed that the seminars and pocket guides improved intrapartum care.

Level 2 was birth attendants’ knowledge and partograph skills, which we evaluated during December 2017 to June 2018. Paired comparisons before and after seminars showed significant improvements in knowledge and partograph skills among 143 seminar participants, of whom 24
were followed through an additional seminar round where further significant improvements were found (Nanna M. and Thomsen C., Mnazi Mmoja Hospital, unpublished data, October 2018).

Levels 3 and 4 were clinical practice and birth outcomes. We conducted a pre–post-intervention study, comparing case files at baseline (October 2014 to January 2015) and one year later (October 2015 to January 2016). As previously published,10,11 we found multiple significant improvements in quality of care, such as reduced median time from last recorded fetal heart rate to delivery; reduced proportion of births using oxytocin augmentation; and an increased proportion of women with severe hypertension receiving antihypertensive drugs. The numbers of stillbirths decreased 34% to 39 per 1000 total births (relative risk, RR: 0.66; 95% confidence interval, CI: 0.53–0.82), while newborns with Apgar score 1–5 halved to 28 per 1000 live births (RR: 0.53; 95% CI: 0.41–0.69).

Training 80 people over 2 days of the seminars costed approximately 800 United States dollars (US$), including laminated pocket guides (US$ 4.80 each), refreshments, photocopies and stationery. The same four whiteboard partographs were used at each seminar (US$ 45 each). A mannequin was already available when a neonatal resuscitation station was added in 2017. The intervention development and evaluation were led by a doctoral fellow and not included in these costs. We have not estimated opportunity costs for voluntary time spent by facilitators, participants, study team members and external reviewers.

Lessons learnt
Introducing locally-tailored clinical guidelines, with quarterly repeated training on their use, improved intrapartum care and birth outcomes in Zanzibar’s tertiary hospital, which appears to have been sustained for 4 years (Herklots T et al., Mnazi Mmoja Hospital, unpublished data, 2018). These changes occurred despite no improvements in staff numbers and staff turnover, no additional medical technology, no other training interventions and continual shortages in supplies. We found high motivation among many birth attendants to learn and to improve care, without additional financial compensation (Box 2).

Nevertheless, developing the PartoMa guidelines was demanding on resources, requiring staff time and capacities, project funding and robust coordination of partners.2 As reported from Uganda,3 such resources can rarely be spared routinely in fragile health-care systems. While WHO encourages guideline adaptation, large-scale international, regional and national clinical guidelines should be better attuned to the constrains of low-resource settings, thereby facilitating facility-level adaptations.
Maternal health guidelines targeting low-resource settings have typically relied on top-down development by experts, often without end-users’ feedback or pilot testing, followed by inflexible cascade implementation and no post-implementation evaluation. An example is WHO’s guide on managing complications in pregnancy and childbirth, which has informed multiple intervention programmes in low-resource settings, including eHealth solutions. Yet, according to a systematic literature review, few evaluations of the guide’s use and effects have been documented since its initial publication in 2000.

When comparing multiple international clinical guidelines in maternal health, inconsistencies have been found across apparently high-quality, evidence-based guidelines. This emphasizes the limitations of experimental studies, and the strong influence of values, culture and professional traditions. Translating evidence into clinical recommendations inevitably requires judgements on benefits and risks, as well as the inclusion of evidence-weak recommendations when weaving together the evidence. Our experience was that such input from a low-resource maternity unit would include aligning guidance with the ratio of attendants to women in labour and with the local level of professional competencies; assessing the risks of contradictory recommendations or an overload of counterproductive guidelines; integrating basic and emergency management; and awareness of additional challenges faced by both providers intended to use the guidelines and the women in labour.

Supported by the study team, a steering group of volunteer birth attendants in Zanzibar have distributed guides and organized seminars since 2016. We have observed signs of ownership of the programme within the steering group, although there are still challenges to sustainability due to high staff turnover. In June 2018, the Zanzibar health ministry, with support from the United Nations Population Fund, took over the continuation and scaling-up of the intervention. The PartoMa seminars are now conducted quarterly in both of Zanzibar’s main islands. We are currently setting up a study in five maternity units in Dar es Salaam, United Republic of Tanzania, to assess whether the intervention can be replicated at scale, and whether the process can serve as pre-service training of health students and as a model for other areas of health care.

The PartoMa study has grown into a valuable single-setting analysis of the applicability of international guidelines targeting maternity care in low-resource settings. We acknowledge the ethical dilemmas of producing achievable guidance for use in settings with inadequate human and economic resources. However, we argue for decision-making support that assists birth attendants in saving lives, rather than best-evidence guidelines that are not used. The global community has
called for context-appropriate implementation strategies with clinical guidelines formulated to facilitate understanding and use.\cite{1,3,12,15} Within and beyond maternal health, realistic clinical guidelines and associated training are conditional for strengthening health systems’ accountability and a fundamental right for birth attendants being responsible for the lives of others.

Acknowledgements

We thank the members of the PartoMa steering group in Zanzibar: Alawiya Abubakar Ahmed, Dhuria Abdallah Ahmed, Fatma Mrisho Haji, Lamlat Hassan Nondo, Maryam Ahmed, Natasha Houseine, Naufal Kassim, Mubina Rajhy, Rashid Saleh Khamis, Saada Juma Amour, Salma Abdi Mahmod, Suhaila Yussuf and Zuhura Abdallah Balozi; the 12 external reviewers of the PartoMa guidelines: Antke Zuechner, Barbara Kwast, Ben Mbwele, Bjarke Lund Sorensen, Brenda D’Mello, Charles Ame, Gaynor Maclean, Hussein Lesio Kidanto, Josephine Obel, Karen Odberg Pettersson, Klaas Koop, Mike English, Rachel Macleod and Tom Weber; and the birth attendants in Zanzibar, the Zanzibar Ministry of Health and the United Nations Population Fund.

Funding

The PartoMa study in Zanzibar was supported by grants from The Lundbeck Foundation (R164-2013-16038), The Laerdal Foundation (40108) and The Augustinus Foundation (14-1059). The PartoMa study is listed in http://www.ClinicalTrials.org (NCT02318420, 4 November 2014).

Competing interests:

None declared.

References


Box 1. **Examples of reflections in the development of intrapartum clinical guidelines at Zanzibar's tertiary hospital, United Republic of Tanzania**

1. Creating time for managing complications

We considered how birth attendants could allocate more time to attend to women with labour complications, such as slow labour progress, while still providing essential monitoring and care for women with uncomplicated labour. Following the World Health Organization (WHO) 2017 recommendations\(^5\) for basic assessments of fetal heart rate, contractions, blood pressure, pulse and vaginal examination during four hours of uncomplicated first stage of active labour would take 110 minutes per woman. Notably, this excludes additional time for providing caring support. As one birth attendant at Zanzibar's tertiary hospital typically cared simultaneously for three or more women in labour, the birth attendant was inevitably forced to prioritize even these basic tasks. Adding to the challenge, levels of knowledge, skill and experience on basic obstetric care were limited among birth attendants, which could compromise attendants' ability to prioritize care in complex and hectic care situations. To create time for managing complications and assist in prioritization, the PartoMa guidelines therefore recommended a lower frequency of basic assessments. This allowed a minimum of 33 minutes per woman for basic assessments over four hours.

2. Safe management of slow labour progress

Blind titration of intravenous oxytocin during labour may cause uterine hyperstimulation with risk of fetal death, uterine rupture and bleeding after birth. Cautious augmentation of labour with oxytocin is thus warranted, but is often hampered in busy, low-resource maternity units by lack of one-to-one care and electronic drip-count devices. WHO recommendations from 2017\(^5\) are that augmentation may be started when cervical dilatation is less than 1 cm per hour. This would cause overuse among many women with uncomplicated variations in the progress of labour. The WHO guidance is, however, contradicted by other recommendations in 2014 and 2018,\(^6,7\) both of which endorse an undefined interval of watchful waiting before starting oxytocin. In Zanzibar's tertiary hospital, considering the high workload carried by too-few birth attendants, and attendants' limited knowledge and skills, we decided it was dangerous and unfair to leave the birth attendants alone to judge how long an undefined interval may last. The PartoMa guidelines therefore recommended reserving intrapartum oxytocin augmentation for women crossing the partograph's action line indicating severe prolonged labour (Fig. 1).


Box 2. **Summary of main lessons learnt**

- Locally adapted clinical guidelines for intrapartum care, co-created with birth attendants, were associated with improvements in knowledge, skills, quality of care and perinatal outcomes.
- Evidence-based guidelines produced at the international, regional and national levels may not lead to change if they cannot be easily adapted at facility level, taking into account resource constraints of particular settings.
- Short, repeated in-house training was highly acceptable among birth attendants, even without financial compensation for attendance outside working hours.
Fig. 1. Extract from the intrapartum clinical guidelines developed at Zanzibar's tertiary hospital, United Republic of Tanzania

ACTIVE FIRST STAGE OF LABOUR
*(Cervix 4-5 cm or more AND regular painful contractions)*

<table>
<thead>
<tr>
<th>Uncomplicated progress</th>
<th>Early detection of slow progress</th>
<th>Poor progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine assessments</td>
<td>Assess 5 Ps*</td>
<td></td>
</tr>
<tr>
<td>caring support</td>
<td><em>(ARM</em>*, spontaneous urination, oral fluid and food, ambulation or upright position, caring and close support)*</td>
<td></td>
</tr>
<tr>
<td>Next PV after 4 hrs</td>
<td><em>(ARM</em>*, spontaneous urination, oral fluid and food, ambulation or upright position, caring and close support)*</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Alert line</strong></td>
<td><strong>Action line</strong></td>
</tr>
<tr>
<td></td>
<td><strong>PV every 2 hrs</strong></td>
<td><strong>PV every 2 hrs</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Decide on CS if:</strong></td>
<td><strong>Decide on CS if:</strong></td>
</tr>
<tr>
<td></td>
<td>1. Progressive signs of obstruction <em>(no further dilatation and descent, moulding +++ and positive FHR)</em></td>
<td>1. Progressive signs of obstruction <em>(no further dilatation and descent, moulding +++ and positive FHR)</em></td>
</tr>
<tr>
<td></td>
<td>2. No progress after 4 hrs oxytocin</td>
<td>2. No progress after 4 hrs oxytocin</td>
</tr>
<tr>
<td></td>
<td>3. Foetal or maternal compromise</td>
<td>3. Foetal or maternal compromise</td>
</tr>
</tbody>
</table>

ARM: artificial rupture of membranes; CS: caesarean section; PV: vaginal examination.

Notes: The extract shows a page of the 2018 version of the PartoMa pocket guide concerning partograph-based guidelines for managing slow progress in the first stage of the active phase of labour. The asterixis refer to information further described on the same page. The 5 Ps refer to a mnemonic for exploring why labour progress is slow and managing the cause(s): Power of contractions, Passenger (malposition, malpresentation, big baby), Pass urine, Psyche (reduce anxiety), Pelvis (severely contracted pelvis). The PartoMa pocket guide is available online at [https://publichealth.ku.dk/about-the-department/global/research/sexual-and-reproductive-health-and-rights/partoma/dokumenter/PartoMa_Pocket_Guide_2_22062018.pdf](https://publichealth.ku.dk/about-the-department/global/research/sexual-and-reproductive-health-and-rights/partoma/dokumenter/PartoMa_Pocket_Guide_2_22062018.pdf).