SHORT REPORT

Understanding Maternal Deaths from the Family's Perspective: Verbal Autopsies in Rural Tanzania

Gail C. Webber[1] and Bwire Chirangi[2]*

[1]Bruyere Research Institute, University of Ottawa Canada; [2]Shirati District Hospital, Rorya District, Mara Region, Tanzania

* **For Correspondence***: E-mail: gwebb035@uottawa.ca; Phone:+1 (613) 233-3101*

Abstract

Maternal mortality rates in rural Tanzania are high. In preparation for the introduction of an intervention to reduce maternal deaths by distribution of misoprostol and erythromycin to women living in rural Rorya District, Mara Region, Tanzania, we conducted a limited verbal autopsy by surveying family members of women who died in childbirth in the previous five years. The purpose of this survey was to understand the circumstances surrounding these deaths. Thirty six family members were interviewed. The majority of the deaths occurred on the roadside as the women made their way to a health facility (23/36). Most of the women were delivered by a TBA (16/36) or family member (13/36). The majority of the family members attributed the death of their loved one to bleeding or retained placenta (32/36). Maternal deaths are common in this rural district of Tanzania because of long distances from the health facilities, difficulty finding transportation, costs of transport and hospital, and women's beliefs about being able to deliver at home and fear of medication. There is a need for increased education of women and their families about the benefits of childbirth in a health care facility attended by skilled providers. There is also a role for the community distribution of misoprostol to be used as an alternative uterotonic medication if a facility birth is not possible, as the rates of maternal death from hemorrhage are unacceptably high. *(Afr J Reprod Health 2014; 18[3]: 128-132)*

Keywords: maternal mortality, verbal autopsy, postpartum hemorrhage.

Résumé

Les taux de mortalité maternelle en Tanzanie rurale sont élevés. En préparation pour la mise en place d'une intervention visant à réduire la mortalité maternelle de distribution de misoprostol et l'érythromycine aux femmes domiciliées dans le district rural Rorya, la région de Mara, en Tanzanie, nous avons effectué une autopsie verbale limitée par sondage auprès des membres de la famille des femmes mortes en couches dans les précédentes cinq ans. Le but de cette enquête était de comprendre les circonstances qui entourent ces décès. Trente-six membres de famille ont été interrogés. La majorité des décès ont eu lieu en la route comme les femmes se dirigeaient à un établissement de santé (23/36). La plupart des femmes ont été livrées par un AT (16/36) ou membre de la famille (13/36). La majorité des membres de la famille ont attribué la mort de leur bien aimée à un saignement ou rétention placentaire (32/36). Les décès maternels sont fréquents dans ce district rural de la Tanzanie en raison des longues distances entre les établissements de santé, la difficulté à trouver le transport, les frais de transport et de l'hôpital et les croyances des femmes au sujet d'être en mesure d'accoucher à domicile et la peur de médicaments. Il est nécessaire de renforcer l'éducation des femmes et de leurs familles sur les avantages de l'accouchement dans un établissement de soins de santé en présence de prestataires qualifiés. Il y a aussi un rôle pour la distribution communautaire de misoprostol pour être utilisé comme un médicament utérotonique alternatif si une naissance dans un établissement de santé n'est pas possible, comme les taux de mortalité maternelle par hémorragie sont inacceptables. *(Afr J Reprod Health 2014; 18[3]: 128-132)*

Mots-clés: mortalité maternelle, autopsie verbale, hémorragie du post-partum.

Introduction

The maternal mortality rate in much of rural sub-Saharan Africa is very high. It is estimated that about 454 women per 100,000 die in childbirth in Tanzania annually[1]. The most common causes of maternal mortality are postpartum hemorrhage, contributing to about 25% of maternal deaths, and sepsis, adding a further 15% of deaths[2]. While the Tanzanian government has made it a priority to reduce maternal mortality by three quarters by 2015, many challenges remain which prevent the attainment of this goal, including lack of sufficient infrastructure, referral systems, and human resources to meet the needs of the population[3]. In rural Tanzania there is evidence that geographic

distances, the costs of transport and hospital care, as well as the attitudes of health care providers are all barriers to women seeking health care facilities at the time of their deliveries[4]. In preparation for the introduction of an intervention to reduce postpartum hemorrhage and sepsis, we undertook a verbal autopsy by surveying family members of women who had died in the previous five years in a selection of villages, in Rorya District, Tanzania. Traditional verbal autopsies rely on data from medical records and health care providers, and are a means to validate the vital statistics registry[5]. As many of the deaths in our study occurred outside of a health care institution, confirmation by medical records and health care provider evidence was not possible. Instead our verbal autopsy survey included a focus on the social factors contributing to the deaths as understood by family members[6]. This short report summarizes the verbal autopsy survey data from this study.

Methods

This study received ethical approval from the Ottawa Hospital Research Ethics Board and the National Institute of Medical Research in Tanzania. The verbal autopsy was part of a pilot study to assess the feasibility of the community distribution of medications to prevent postpartum hemorrhage and sepsis in villages served by 12 rural dispensaries in Rorya District, Mara Region, Tanzania. We used medical records and the knowledge of local health care providers to identify family members of women who had died in childbirth between 2007 and August 2012 in this area. Research assistants contacted these family members, explained the research, and obtained informed consent for their participation in the verbal autopsy survey. The research assistants then asked the family member the survey questions and documented their responses. The survey was conducted in Kiswahili. The survey contained both quantitative questions and opportunities for qualitative responses. The survey questions focused on the circumstances of the death (where it occurred, who was in attendance), the reasons for the death according to the family, and factors preventing a hospital birth. The surveys and their responses were translated into English, and analyzed by the authors for both quantitative findings and qualitative themes.

Results

A total of 36 family members of women who died in childbirth were surveyed. The dates of death were distributed across the 5 year period: 2007 (10), 2008 (4), 2009 (7), 2010 (2), 2011 (6), and 2012 (7). None of the women who died had received the study medications although in one case, the woman was offered the medications and refused them (case #36). The quantitative findings from the survey are illustrated in Table 1.

Most of the women who died (30 out of 36) had deliveries that were attended by family only, by an unskilled birth attendant (TBA), or in one case, the delivery was unattended. The most common site of death for women was on the way to a health care facility. Often there was a delay in deciding to go to the facility. Family members reported that several women decided they could deliver at home as they had done it safely with previous children. For example, the family member of one woman who died in March 2012 reported that the woman did not inform others that she was having labour pains and "The woman decided to deliver at home because she usually delivers the babies at home safely; she did that in all pregnancies." (Case #29).

Two of the most significant barriers to getting care were the difficulty finding transport, and the great distances to the facilities for some women. The family member of a woman who died in May 2011 described that "Transport was a problem because they had to take a bicycle to take her to the hospital which was slow and it delayed her until she died on the way." (Case #18).

Cultural beliefs also played a role in maternal deaths, particularly in the most recent case. In June 2012, during the study period, a woman delivering at the dispensary was offered misoprostol by the dispensary nurse. Unfortunately, the woman believed the misoprostol would poison her and refused to take it. She later had a severe postpartum hemorrhage and died on the way to hospital (Case #36).

Table 1: Results of Verbal Autopsy Survey

Question	Response	Frequency	Percentage
Place of Death (n=36)	Roadside (on route to facility)	23	63.9
	Hospital	6	16.7
	Home	3	8.3
	TBA's home	3	8.3
	Dispensary	1	2.8
Attendance at Delivery (n = 36)	TBA (+/- relatives)	16	44.4
	Relative or Neighbour only	13	36.1
	Nurse Assistant	1	2.8
	Skilled personnel (nurse/clinician)	5	13.9
	Unattended delivery	1	2.8
Cause of death according to family member (n = 36)	Bleeding or Retained placenta	32	88.9
	Eclampsia	1	2.8
	Twin birth, died after first delivered	1	2.8
	Malaria, refused meds	1	2.8
	Unknown	1	2.8
Factors Preventing Hospital Birth*	No time to get to hospital (n=16)	10*	62.5*
	No transport to get to hospital (n=22)	18*	81.8*
	No money for transport (n=21)	8*	38.1*
	No money for hospital (n=21)	7*	33.3*

*Missing data in this question, hence percentages based on those who replied to this question.

Discussion

The findings of our limited verbal autopsy study in rural Rorya District of Tanzania confirm the risks of non-facility childbirth in rural Africa. Over eighty percent of the women who died delivered outside of a health care facility and without a skilled attendant at the birth. Many of the women who died sought medical assistance too late; sixty four percent of the women died on route to a health facility. Family members perceived that the majority of deaths were due to bleeding or retained placenta (which results in bleeding): this was the cause of death attributed by family members in almost ninety percent of the cases.

Reducing the number of women who deliver their babies outside of a health care facility should be the first priority for reducing maternal mortality. Access to skilled health care providers and appropriate uterotonic medications such as oxytocin could eliminate many deaths from postpartum hemorrhage. As discussed earlier, however, the answer is not as simple as educating women and their families about the need for facility births. The barriers to accessing a health facility at the time of delivery are numerous and involve geographic distance, financial costs of transport and hospital expenses, as well as social factors such as health care provider attitudes[4]. Until high quality health care facilities can be made available in even the most remote locations and be reliably staffed and stocked with appropriate medications[3], many rural women will require other options. For those women who are not able to access health care facilities at the time of delivery, or for those who can access rural dispensaries, but discover that supplies needed for a safe delivery (such as oxytocin) are not in stock, an alternative solution is required.

We propose that community distribution of misoprostol to women during their pregnancy is both feasible and desirable in rural Tanzania. The

World Health Organization and the International Federation of Obstetricians and Gynecologists have recommended the use of misoprostol to prevent postpartum hemorrhage in settings where access to oxytocin is not possible[7,8], however, the WHO recommends further research to determine the safety of a self-administration program of misoprostol[9]. Misoprostol for postpartum hemorrhage prevention has been successfully studied in Tanzania by others previously using TBAs[10] or dispensary nurses[11] for distribution. Future distribution through TBAs is unlikely given the current Tanzanian government policies discouraging TBAs from assisting with deliveries. In addition, as noted by our verbal autopsy data, many women are unattended by even a TBA at delivery. Relying solely on dispensary nurses misses some women who do not access antenatal care through these health care providers[11]. Thus, we argue that the misoprostol should be distributed to the women directly by both dispensary nurses at antenatal visits and trained community health workers who can deliver the intervention at the village level.

There is insufficient evidence that a single dose of erythromycin at delivery prevents puerperal sepsis. Instead of antibiotics, for community births, clean delivery kits are often used, though the data on their effectiveness remains to be established[12]. In the scale-up of our program we intend to provide the misoprostol in a delivery kit containing a clean mat, gloves, a razor to cut the cord and cord ties, and to study carefully how each component of the kit is used.

Limitations

There are several limitations to this verbal autopsy data. There is incomplete data in some cases. In addition, there may be a reporting bias by family members as some of the deaths occurred several years previously. It is possible that over time the family members may forget details of the death or may attribute more blame to the women about deciding to stay home for delivery, rather than admitting their own role in this decision.

Another limitation of this study is that the cause of death was not confirmed by medical staff, as in classic verbal autopsy studies[5], however as most of the deaths occurred outside of a health care institution, there were no medical records to use as confirmation. Because of the timing of the deaths, it is likely that the cause of death was childbirth-related. All the women but one died during or immediately after delivery. One woman died 3 weeks after her delivery. As all deaths occurred within 6 weeks of delivery, they meet the criteria for maternal mortality[13], and although actual cause of death (e.g. hemorrhage) cannot be confirmed from family reporting, by family description there does appear to be a large proportion of the women who died from hemorrhage.

Conclusions

Maternal deaths are common in this rural district of Tanzania because of long distances from the health facilities, difficulty finding transportation, costs of transport and hospital care, and women's beliefs about being able to delivery at home and fear of medication. Bleeding appears to be a major cause of death, although this should be confirmed using medical records or physician opinion in future verbal autopsies. Reducing maternal deaths requires a multi-pronged approach. Clearly, the longer term solution is the provision of fully equipped and staffed health facilities in the rural regions close to where women live. However, costs, human resource issues, and competing government priorities prevent this from happening in the immediate future. Other solutions include education programs about the importance of facility births and dangers of delaying travel, vouchers for transport for pregnant women, and ambulance services for obstetric emergencies. As postpartum hemorrhage is a common cause of death for these women, a community distribution program of misoprostol may also help prevent this high rate of maternal mortality. In scale-up plans for this research, we plan to educate women about safe birthing practices and distribute misoprostol in delivery kits to women in rural Mara region with the goal of reducing the high rate of maternal mortality in this region.

Contribution of Authors

Dr. Gail Webber conceived of the study, and applied and received funding for this study from

Grand Challenges Canada, with the support of Dr. Bwire Chirangi. Both authors applied for ethics approval in their respective countries and trained the local research team. Dr. Chirangi directly supervised the research team and reviewed the translation of all documents from Kiswahili into English. Dr. Webber was responsible for data analysis and the preparation of the initial draft of this manuscript. Both authors approved the final manuscript.

References

1. National Bureau of Statistics (NBS) [Tanzania] and ICF Macro. 2011. Tanzania Demographic and Health Survey 2010. Dar es Salaam, Tanzania: NBS and ICF Macro.
2. Sullivan T, Hirst J. Reducing Maternal Mortality: A Review of Progress and Evidence-Based Strategies to Achieve Millennium Development Goal 5. *Health Care for Women International 2011*; 32: 901–916.
3. Winani, K. Maternal and newborn health in Tanzania. *International Journal of Gynecology and Obstetrics 2011*; 112: 6–7
4. Women's Dignity and CARE International in Tanzania. (2008). 'We have no Choice' Facility-Based Childbirth: The Perception and Experiences of Tanzanian Women, Health Workers, and Traditional Birth Attendants. [Report]. Retrieved from http://www.policyforum-tz.org/files/childbirth.pdf
5. Setel PW, Whiting DR, Hemed Y, Chandramohan C, Wolfson LJ, Alberti KGMM, and Lopez AD. Validity of verbal autopsy procedures for determining cause of death in Tanzania. Tropical Medicine & International Health 2006; 11(5): 681-696.
6. Kalter HD, Salgado R, Babille M, Koffi AK, and Black RE. Social autopsy for maternal and child deaths: a comprehensive literature review to examine the concept and the development of the method. Population Health Metrics 2011; 9:45
7. World Health Organization . (2012) WHO recommendations for the prevention and treatment of postpartum haemorrhage. [Report]. Retrieved from http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/9789241548502/en/
8. FIGO Safe Motherhood and Newborn Committee. Prevention and treatment of postpartum hemorrhage in low-resource settings. International Journal of Gynecology and Obstetrics 2012; 117: 108-118.
9. World Health Organization. (2012). Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting: Optimize MNH. [Report]. Retrieved from http://apps.who.int/iris/bitstream/10665/77764/1/9789241504843_eng.pdf
10. Prata N, Mbaruki G, Grossman AA, Holston M, and Hsieh K. Community-Based Availability of Misoprostol: Is it Safe? Afri J Reprod Health 2009; 13: 117-128.
11. Ifakara Health Institute, Venture Strategies Innovations, Bixby Center for Population, Health and Sustainability, Population Services International (PSI)/Tanzania. (2011). Prevention of Postpartum Hemorrhage at Home Births: Misoprostol Distribution during Antenatal Visits Final Report. [Report].
12. Hundley VA, Avan BI, Braunholtz D, Fitzmaurice AE, and Graham WJ, Lessons regarding the use of birth kits in low resource countries. Midwifery 2011; 27: e222–e230.
13. World Health Organization et al, Trends in Maternal Mortality: 1990 to 2008, Estimated developed by WHO, UNICEF, UNFPA and The World Bank. Geneva: 2010.