

Maternal mortality: reducing severe postpartum haemorrhage

Background

Previous cohort studies conducted by the mobile team of Bandim health Project (BHP) revealed a maternal mortality ratio of 822 per 100,000 live births. The most important cause of maternal death was postpartum haemorrhage (PPH). The primary cause of PPH is generally known to be uterine atony accounting for 70 percent of cases.

Several drugs are known to reduce PPH by facilitating contractions of the uterus. Ergot derivatives, oxytocin and injectable prostaglandins are standard treatment for the condition in all well equipped delivery units all over the world. However, these drugs require cool storage to remain effective. Moreover, most uterotonics must be administered as injections, which requires sterile utensils and training in safe administration, prerequisites unavailable for

most women delivering in low-income countries.

Misoprostol, a prostaglandin E1 analogous, is heat stable and can be administered orally, rectally or sublingually. A WHO-sponsored multi-centre study have found misoprostol to be less effective for prophylaxis than injections of 10 IU i.v./i.m. oxytocin, but failed to address the possible benefit of misoprostol to the large number of women who give birth outside a health facility with refrigerators.

All previous randomised studies of misoprostol for prevention of PPH have examined the oral and rectal route of administration. As pharmacokinetic studies have indicated that the sublingual route of administration secures the highest peak concentration and the best bioavailability we planned to test if routine administration of sublingual misoprostol could reduce the inci-





dence of PPH in a resource-poor, primary health care setting. For this purpose we randomised 661 women, who gave birth at Bandim Health Centre between March 2003 and August 2004, to prophylaxis with sublingual misoprostol 600 μ g (N=330) or placebo (N=331).

Results

Using a more accurate method of measuring quantities of blood lost after delivery, a blood loss of more than 1000 ml was found in 17% of women in the placebo group, but only in 11% in the misoprostol group (relative risk (RR) = 0.66 (0.45 to 0.98)). Severe PPH of more than 1500 ml was found in 8% of control women, but only in 2% of misoprostol receivers (RR=0.28 (0.12 to 0.64)). The mean blood loss was significantly lower in the misoprostol group (555 ml (standard deviation(SD): 355 ml)) compared with the control group (655 ml (SD: 523 ml)) (P<0.01). Significantly more women in the misoprostol group experienced shivering and pyrexia, but the discomfort eased off a few hours after ingestion.

Public health implications

In Bandim 31% of pregnant women were found anaemic, making them vulnerable to the blood loss occurring during a delivery. Maternal mortality is found to be 4-fold higher in severely anaemic women compared with non-anaemic controls. In rural Guinea-Bissau, 75 % of women give birth at home and worldwide only about 50 % give birth in health facilities. Therefore, strategies must be identified to increase safety of deliveries not attended by skilled birth attendants. According to our studies it might be safe and useful to distribute misoprostol among traditional birth attendants, to teach safe use of the drug

and other forms of prevention of PPH and to raise awareness of potential complications among the pregnant women. The mothers and their helpers should be informed that shivering and mild fever can be expected and continuous bleeding after misoprostol and uterine massage requires prompt attendance by the health care system.

Future perspectives

Worldwide there is a strong need to investigate simple measures, which can be applied universally at a community level to reduce the burden of postpartum haemorrhage. It is well docu-

mented that active management of the third stage of labor (administration of an uterotonic agent, early cord clamping and uterine massage) reduces blood loss after delivery, but it is still unclear how these components interact and if misoprostol could substitute oxytocin or methergin in the active management strategy. There is also little empirical research to evaluate the effectiveness of continued uterine massage. BHP holds a unique position to study the use of misoprostol and other simple and inexpensive procedures outside tertiary health facilities.

References on maternal mortality and postpartum haemorrhage: 35,39,114,137

Table 1. Blood loss and change in haemoglobin

	Misoprostol n=330	Control n=331	RR (95% CI)
Measured blood loss (median [IQR])	475ml [319-736]	512ml [315-774]	P = 0.15*
No of pt. with Blood loss > 500 ml (n [%])	150 [45%]	170 [51%]	0.89 (0.76-1.04)
No of pt. with Blood loss > 1000 ml (n [%])	37 [11%]	56 [17%]	0.66 (0.45-0.98)
No of pt. with Blood loss > 1500 ml (n [%])	7 [2%]	25 [8%]	0.28 (0.12-0.64)
Haemoglobin decrease (median [IQR])	0.2mmol/l [-0.3-0.9]	0.4mmol/l [-0.2-1.1]	P = 0.08*
No of pt. with 10% fall in hgb level (n [%])	105 [32%]	115 [35%]	0.92 (0.74-1.14)

*Wilcoxon rank-sum test

Low birth weight delivery and maternal mortality

Background

Maternal mortality (MM) is a leading cause of death among women of reproductive age and a burden on health systems in the low-income countries. However, the knowledge on how to prevent MM is limited. Many of the most affected countries do not have good health statistics and few risk factors have been identified. We studied the association between giving birth to a low-birth-weight (LBW) infant and maternal mortality.

Results

A total of 5230 mothers giving birth at the National Hospital of Guinea-Bissau and whose children participated in a randomised trial were followed for mortality during the first 90 days after delivery. Mortality from delivery to 90

days postpartum was higher among mothers of LBW infants compared with mothers of normal-birth-weight infants (NBW), the adjusted mortality rate ratio being 12.7 (3.6-44). The disparity between mothers of LBW and mothers of NBW infants was particularly apparent after the first week postpartum. Mothers of LBW infants continued to have a high mortality rate during the 90 days (Figure).

Public health implications and future perspectives

In low-income countries the burden of MM is high and consequences are widespread for families and the society. It is well-known that motherless children have a significantly higher mortality, hence preventing a maternal death often also implies saving her offspring's life. To single out the mothers at highest risk would help con-

centrate the sparse resources on those most in need. Experiences from other countries support the belief that the high incidence of MM can be reversed with concerted efforts. Methods to define risk groups must be uncomplicated, not using any advanced equipment, to be functional in low-income countries. Based on our results, the distinction between mothers of LBW infants

and mothers of NBW infants is an important contribution to the understanding of MM. An LBW delivery is a serious symptom that should lead to increased awareness and to programmes for monitoring and improving the health of mothers who deliver an LBW infant.

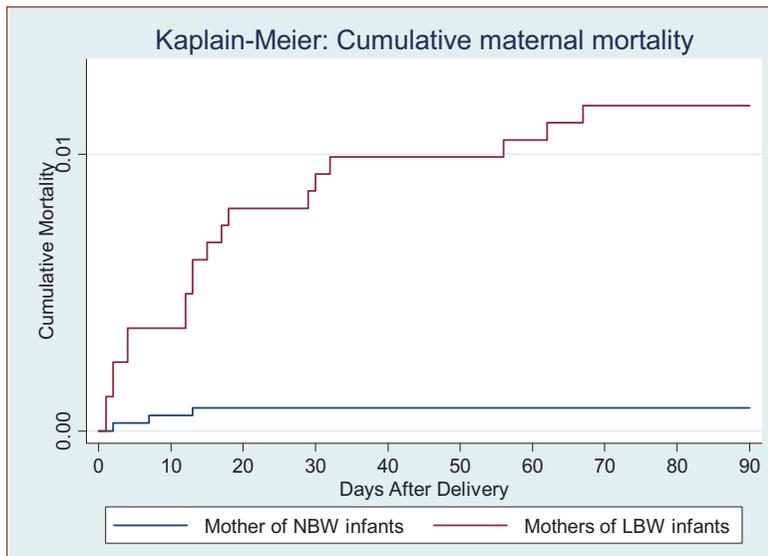


Figure. Cumulative mortality among mothers of LBW infants and mothers of NBW infants

