

# Post-Partum Hemorrhage is still killing mothers in Bangladesh: Inhaled oxytocin (IHO) can help

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## Short report

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# Abstract

The main cause of maternal death in Bangladesh is postpartum hemorrhage (PPH). PPH accounts for 31% of maternal deaths. Proven interventions to prevent maternal mortality are active management of third stage of labour (AMTSL) and the availability of comprehensive emergency obstetric care (CEmOC); both include the administration of oxytocin. Traditional parenteral oxytocin administration requires a consistent cold chain and for a skilled attendant to administer the injection. Inhaled oxytocin (IHO), which does not require a cold chain, has been shown to have similar efficacy to parenteral oxytocin, in preventing PPH. In Bangladesh there are non-functioning institutionalized guidelines from the Director General of Health Services on the storage of parenteral oxytocin, which may impact the potency of oxytocin used during labour. To reduce preventable PPH morbidity and mortality, Bangladesh needs to consider replacing parenteral oxytocin with IHO, as the cold chain capacity in Bangladesh is strained, and institutional guidelines for injectable oxytocin are not used. In parallel, Bangladesh should also continue efforts to ensure universal access to quality AMSTL and CEmOC services.

## Background:

Declines in the maternal mortality ratio (MMR) have stalled in Bangladesh, with no significant change between 2010 (194/100000 LB) and 2016 (196/1000000 LB) [1]. The MMR has remained static even though access to maternity care services such as antenatal care, institutional delivery and caesarean section have improved considerably during that period of time [2]. Currently 47% deliveries take place in health facilities: 29% in for-profit private facilities, 14% in public facilities, and rest 4% in NGO facilities. Despite increased access to basic and comprehensive emergency obstetric care services, too many women are still dying around childbirth [3].

## Management of Postpartum Hemorrhage:

Data depicts that majority of maternal deaths take place immediately after birth, and that postpartum hemorrhage (PPH) is the leading cause of MMR. PPH's contribution to maternal mortality, in Bangladesh, has remained unchanged over time, accounting for 31% of all maternal deaths in both 2010 and 2016. [2]. The 'active management of third stage of labour (AMTSL)' and 'provision of Comprehensive Emergency Obstetric Care (CEmOC) services' are proven interventions to combat PPH related mortality and morbidity [4-6]. An important component of both CEmOC and AMSTL is administering parenteral oxytocin within one minute after childbirth. The availability and proper use of oxytocin during labor is critical in preventing PPH. Inhaled oxytocin (IHO) has been shown to have the same efficacy as intravenous oxytocin, and has been suggested as an option for resource poor settings, where cold chain systems cannot be guaranteed [7]. Study suggest that 400 micro gram inhaled oxytocin and 10 unit parenteral oxytocin have the same effect [2, 3, 7].

## Methods:

This case report is based on the secondary review of published and grey literatures related to PPH. We reviewed the Bangladesh Maternal Mortality Survey (BMMS 2016) and Bangladesh Demographic and Health Survey (BDHS 2017-18) to understand the statistics on PPH and its relation with other maternal health service coverage. A scoping review on published and unpublished literature provides evidence on the cost-effectiveness and efficacy of using IHO as a replacement for parenteral oxytocin. A systematic literature search was done using key term oxytocin, parenteral, inhaled, efficacy and cost-effectiveness after adding appropriate Boolean operators. We have also reviewed existing government guidelines on the administration, storage and distribution of parenteral oxytocin for the prevention of PPH in Bangladesh [8].

## Results:

A recent study in Bangladesh reported oxytocin administration was suboptimal at 94% of district hospitals and 71% of sub-district hospitals [9]. The BMMS 2016 data also shows that only 41% of public hospitals qualified as functional CEmOC facilities [2]. This means that the majority of facilities are not fully compliant with CEmOC and AMSTL protocols. The data also indicate that parenteral oxytocin use is suboptimal with issues of availability and, potentially, potency. Unfortunately, in Bangladesh there are no formal guidelines on the use and storage of parenteral oxytocin in the public and private sector [10, 11]. The Directorate General of Health Services Bangladesh issued a circular in 2012 for the proper use of parenteral oxytocin in health facilities but this has not been institutionalized [8, 12].

## Discussion:

Parenteral oxytocin needs to be stored in appropriate temperature controlled conditions and discarded after the manufacturers' "use by" date; otherwise there is a risk that its efficacy will be compromised [13]. In the absence of clear protocols on parenteral oxytocin storage and use there is a very real danger that even if administered, as part of AMSTL and CEmOC protocol, it will lack efficacy [14]. PPH will continue to kill mothers in Bangladesh, and the national MMR will not improve unless providers correctly follow AMSTL and CEmOC protocols, which include the administration of oxytocin. In the Bangladeshi context, the availability and quality of parenteral oxytocin is suspect, due to a lack of guidelines and cold chain weaknesses. To reduce the maternal mortality due to PPH, the following actions should be prioritized for Bangladesh:

- a. Advocate for the replacement of parenteral oxytocin with IHO in the public and private sector
- b. Develop and enforce clear guidelines on the administration of IHO for the public and private sector.
- c. Ensure all providers, including private hospital providers, are fully compliant with proper implementation of AMSTL protocols when IHO is replaced with conventional oxytocin.
- d. Ensure all facilities (private and public) have CEmOC facilities.
- e. Document the impact replacing conventional oxytocin with IHO and contribute to the evidence base on the efficacy of IHO in resource poor settings with supply chain challenges.

## Conclusion:

Bangladesh has been successful in reducing maternal mortality, however MMRs will remain stubbornly high and mothers will continue to die of preventable PPH deaths if quality oxytocin is not available and used according to AMSTL and CEmOC protocols.

## Abbreviations

AMSTL: Active Management of Third Stage of Labour

BDHS: Bangladesh Health and Demography Survey

BMMS: Bangladesh Maternal Mortality Survey

CEmOC: Comprehensive emergency obstetric care

MMR: Maternal Mortality Ratio

PPH: Post-Partum Hemorrhage

## Declarations

### Policy Recommendation:

Injectable oxytocin should be replaced with inhaled oxytocin (IHO)

- Manuscript must contain the following sections under the heading 'Declarations':

### Ethics approval and consent to participate

The used reports are open access and public document. There is no need to take permission. Moreover, data was presented as if no individual can be trace back.

### Consent for publication

Not needed as it is publicly available data and the owner of this data has provided prior consent to publish article with this data

### Availability of data and material

The survey data was already publicly already available

### Competing interests

The author reports no conflicts of interest in this work.

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## Authors' contributions

AR has conceptualized the editorial and led the development of the first draft. AA, TB and IA all have reviewed the editorial and agree to be accountable for all aspects of the work.

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Not Applicable

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