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Review Article

Active Management of the Third Stage of Labour: A Brief Review and Update

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Abstract:

Blood loss due to postpartum haemorrhage (PPH) and its complications constitute one of the major causes of maternal mortality and morbidity. Active management of third stage of labour (AMTSL) plays an immense role in preventing maternal death due PPH. But till date obstetricians all over the world and the concerned international bodies could not reach to a single agreement about its universal use. This approach is practiced widely in many centres and there are some specific guidelines regarding its practical use. AMTSL as a prophylactic intervention and is composed of a package of three components or steps: 1) administration of a uterotonic, preferably oxytocin, immediately after birth of the baby; 2) controlled cord traction (CCT) to deliver the placenta; and 3) massage of the uterine fundus after the placenta is delivered. In 2012, the results of a large WHO-directed, multi-centred clinical trial showed that the most important AMTSL component was the administration of an uterotonic, the other two steps contributes relatively less in blood loss. But WHO recommends to continue all three steps of AMTSL for management and training of third stage of labour. This article is a brief review of the recent guidelines and evidence based practice of active management of the third stage of labour.

Keywords: *Active management; third stage of labour; AMTSL; postpartum haemorrhage.*

Introduction:

Postpartum haemorrhage (PPH) is a potentially life threatening condition that is a leading cause of maternal mortality and morbidity especially in underdeveloped countries. Haemorrhage accounted for 27·1% (661 000, 19·9–36·2) of maternal deaths worldwide[1]; and 33% of maternal deaths in Bangladesh[2]. PPH contributes the most of the cause of obstetric hemorrhage. Active management of the third stage of labour (AMTSL) can prevent its occurrence as the main risk of PPH is during this stage[3]. There are two distinct approaches to the management of the third stage of labour: expectant and active management. However, a third one is sometimes used that consists of a combination of components of both the approaches which is referred to as 'mixed management' or the 'piecemeal approach'.[4,5] However, World Health Organization (WHO) suggested the active management of the third stage of labour.[6]

Expectant management is also known as conservative or physiological management, where signs of placental separation are awaited and the placenta is delivered spontaneously or with the aid of gravity and sometimes by maternal effort, and no intervention is needed or done.[5,7] Active management of third stage was introduced to try to reduce severe blood loss at birth and reduction in the incidence of manual removal of the placenta and a number of studies demonstrate that this approach decreases blood loss, in comparison with expectant management.[8]

Active management involves a recommended series of steps, including the provision of uterotonic drugs immediately after delivery of the baby, controlled cord

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traction, and massage of the uterine fundus, as developed by the World Health Organization.[3] Mixed management of the third stage consists of a mixture of some of the components of both active and expectant approach. Although active management of the third stage is usually recommended[9-11], there are many variations, and in practice some women may actually receive mixed management.[12,13]

Though the practical application of AMTSL can literally save many lives, the need for active management is still not universally recognized. In a joint statement, WHO, the International Federation of Gynaecologists and Obstetricians and the International Confederations of Midwives recommend AMTSL in all vaginal deliveries, whereas NICE guidelines reserve it for only those women who have a low risk of PPH and who also do not request physiological management after being given information about both options.[8,14] Many other studies and official bodies recommend its use only after the woman has been given explanations about the risks and advantages of both approaches and takes an informed choice to have this method adopted.

Each method is claimed to have superior benefits. However, several trials have been conducted and their analysis reveals that there is no significant advantage to the active management of the third stage, with respect to severe postpartum hemorrhage, need for blood transfusion and need for the use of uterotonics. It did show benefits in overall reduction in PPH, in incidence of manual removal of the placenta and in the overall duration of the third stage.[8,14]

Patients should also be counseled that there are some adverse effects of AMTSL. Adverse effects related to uterotonic agents are hypertension, nausea, vomiting due to ergot alkaloids and there is a little more risk of placental retention. Neonatal risks related to early cord clamping are iron-deficiency anemia, intraventricular hemorrhage and hypotension.[3,15]

Principles

According to WHO recommendations,[16] active management of the third stage of labour is a set of interventions which include –

a) Administration of uterotonic agents after delivery of the baby

b) Expulsion of placenta with controlled traction of cord

c) Uterine fundal massage after expulsion of placenta

Uterotonic agents

1) Oxytocin: Oxytocin is the primary drug of choice in the active management. It increases the amplitude and frequency of contractions of the uterine smooth muscles. Oxytocin can be used just after delivery of the front shoulder of the baby or expulsion of the placenta. Generally, 10 IU of oxytocin is given intramuscularly (IM). It can also be used intravenously (IV), which is typically preferred during cesarean sections (CS). An oxytocin tablet has recently been developed that can be given via the sublingual route.[3] In a 600-patient study from Turkey, there was no statistically significant difference in the amount of postpartum blood loss between IM and IV administration.[17] Oxytocin also decreased postpartum blood loss when applied inside the placental cord.[18]

2) Ergometrine (methergine): In a study, it was found that methylergometrine had the “best” uterotonic drug profile i.e. lowest blood loss during the third stage and duration of the third stage of labour.[19] But ergometrine causes continuous contraction of the uterus and there is not enough evidence about its use as a single agent. It is typically administered at 0.2 mg IM. Its use must be avoided in patients with hypertension.[3]

3) Syntometrine: This contains 5 IU oxytocin and 0.5 mg ergometrine. Although it was found to be more effective than oxytocin in a review, the adverse effect profile (hypertension, nausea, vomiting) restricts its use.[20]

4) Misoprostol: This is a synthetic prostaglandin E1 derivative. It is an inexpensive drug and is stored readily. It does not cause high blood pressure and can be used in patients with asthma. Its most common adverse effect is flushing. Although the amount of blood loss has been shown to have been reduced with prophylactic use of 600-800 mcg misoprostol in many studies, it is not as effective as oxytocin. Consequently, oxytocin is the first choice for the prophylaxis of PPH. [21-23]

5) Tranexamic acid (TA): It is an anti-fibrinolytic agent. It can be used in an oral, local or parenteral manner. One gram of IV TA given within 3 hours of PPH was reported to significantly reduce maternal death and the need for surgery in the WOMAN trial (World Maternal Antifibrinolytic Trial).[24] In pill form, it is recommended at a 15-25 mg/kg/dosage every 8 h orally for 5-10 days. The maximum dose is 3-4 g. It should be given at 10 mg/kg/dosage (maximum 500 mg) with slow infusion every 8 h when given parenterally.[25-26] The amount of blood loss decreased with the use of TA and no adverse effects were reported both after cesarean section and vaginal delivery.[3]

6) Carbetocin: In many low- and middle-income countries where access to sustained cold-chain is unavailable, the efficacy of oxytocin cannot be assured because it is susceptible to heat degradation.[27] Heat stable carbetocin is being investigated as a potential alternative to oxytocin and is the subject of two large ongoing clinical trials – the WHO trial and the IMox trial, for use in prevention of PPH in vaginal deliveries.[28] The recommended dose is 100 mg I.V.

Contextual considerations in selecting a uterotonic for postpartum haemorrhage prevention (only quality-assured medicines should be used regardless of which uterotonic option is selected). [29]

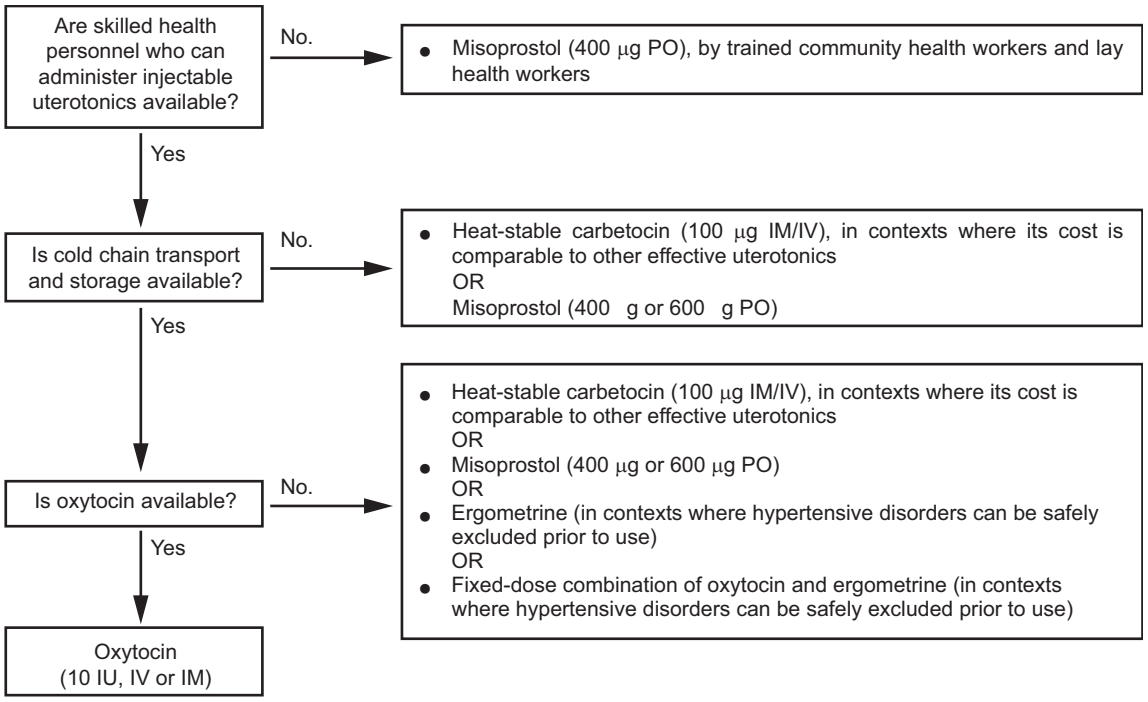
Delivery of placenta by controlled cord traction

WHO recommended this in the 2007 guidelines, but it is described as optional for the active management of the third stage in the 2012 updated guidelines[30]. An inexperienced operator may cause serious complications, such as uterine inversion. In WHO studies, it was accepted as ineffective for decreasing blood loss. However, in a meta-analysis, it was shown

Table-I

WHO recommendations on uterotonics for PPH prevention[29]

Context	Recommendation
Efficacy and safety of uterotonics for PPH prevention	1. The use of an effective uterotonic for the prevention of PPH during the third stage of labour is recommended for all births. To effectively prevent PPH, only one of the following uterotonics should be used: Oxytocin (recommendation 1.1). Carbetocin (recommendation 1.2). Misoprostol (recommendation 1.3). Ergometrine/methylergometrine (recommendation 1.4). Oxytocin and ergometrine fixed dose combination (recommendation 1.5).
Choice of uterotonics for PPH prevention	1.1 The use of oxytocin (10 IU, IM/IV) is recommended for the prevention of PPH for all births. 1.2 The use of carbetocin (100 µg, IM/IV) is recommended for the prevention of PPH for all births in contexts where its cost is comparable to other effective uterotonics. 1.3 The use of misoprostol (either 400 µg or 600 µg, PO) is recommended for the prevention of PPH for all births. 1.4 The use of ergometrine/methylergometrine (200 µg, IM/IV) is recommended for the prevention of PPH in contexts where hypertensive disorders can be safely excluded prior to its use. 1.5 The use of oxytocin and ergometrine fixed-dose combination (5 IU/500 µg, IM) is recommended for the prevention of PPH in contexts where hypertensive disorders can be safely excluded prior to its use. 1.6 Injectable prostaglandins (carboprost or sulprostone) are not recommended for the prevention of PPH. Choice of uterotonics for PPH prevention 2. In settings where multiple uterotonic options are available, oxytocin (10 IU, IM/IV) is the recommended uterotonic agent for the prevention of PPH for all births. 3. In settings where oxytocin is unavailable (or its quality cannot be guaranteed), the use of other injectable uterotonics (carbetocin, or if appropriate ergometrine/methylergometrine or oxytocin and ergometrine fixed-dose combination) or oral misoprostol is recommended for the prevention of PPH. 4. In settings where skilled health personnel are not present to administer injectable uterotonics, the administration of misoprostol (400 µg or 600 µg PO) by community healthcare workers and lay health workers is recommended for the prevention of PPH.
IM, intramuscular; IV, intravenous; PO, per oral; PPH, postpartum haemorrhage.	



Joshua P Vogel et al. BMJ Glob Health 2019;4:e001466

Fig.-1: *Contextual consideration in selecting a uterotonic for postpartum haemorrhage prevention*[29]

that although the risk of blood loss above 1000 ml was not decreased with controlled cord traction, the mean time of the third stage, the mean blood loss (less than 10 ml), and the risk of blood loss less than 500 ml were all decreased[31]. It was concluded that controlled cord traction still had a place in active management when performed by experienced personnel. It is also a recommended method for Ceasarean section.

Uterine fundal massage after placental expulsion

Uterine fundal massage after placental expulsion helps uterine contractions as it stimulates endogenous prostaglandin secretion. This was a recommended step in the 2007 WHO guidelines, and was described as optional for the active management of the third stage in the 2012 updated guidelines[30].

In a systematic review on active versus expectant management for women in the third stage of labour: evidence suggested that for women at mixed levels of risk of bleeding, active management showed a reduction in the average risk of maternal primary haemorrhage at time of birth (more than 1000 mL) (average risk ratio (RR) 0.34, 95% confidence interval (CI) 0.14 to 0.87; and of maternal haemoglobin (Hb) less than 9 g/dL following birth (average RR 0.50, 95% CI 0.30 to 0.83[31]. Active management also showed a significant decrease in primary blood loss greater than 500 mL, and mean maternal blood loss at birth, maternal blood transfusion and therapeutic uterotonics during the third stage or within the first 24 hours, or both, but there was significant increases in maternal diastolic blood pressure, vomiting after birth, after pains, use of analgesia from birth up to discharge from the labour. There was also a decrease in the baby's birthweight with active management, reflecting the lower blood volume from interference with placental transfusion[31].

Implications for Policy, Training and Service Delivery

Although these new WHO recommendations highlight the importance of the administration of a uterotonic in the prevention of PPH, they in fact do not suggest that there should be a change in how providers are trained in AMTSL or how AMTSL is implemented in health care facilities that provide delivery services. These recommendations clarify the most important components of AMTSL and suggest that there should be an expanded emphasis on ensuring that every woman, regardless of where she delivers, is offered a high-quality uterotonic at the time of birth. This emphasis can both increase coverage, by expanding

Recommendations for the prevention of PPH(WHO)[30]

1. The use of uterotonics for the prevention of PPH during the third stage of labour is recommended for all births. (Strong recommendation, moderate-quality evidence)
2. Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug for the prevention of PPH. (Strong recommendation, moderate-quality evidence)
3. In settings where oxytocin is unavailable, the use of other injectable uterotonics (if appropriate ergometrine/methylergometrine or the fixed drug combination of oxytocin and ergometrine) or oral misoprostol (600 µg) is recommended. (Strong recommendation, moderate quality evidence)
4. In settings where skilled birth attendants are not present and oxytocin is unavailable, the administration of misoprostol (600 µg PO) by community health care workers and lay health workers is recommended for the prevention of PPH. (Strong recommendation, moderate equality evidence)
5. In settings where skilled birth attendants are available, CCT is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important (Weak recommendation, high-quality evidence)
6. In settings where skilled birth attendants are unavailable, CCT is not recommended. (Strong recommendation, moderate-quality evidence)
7. Late cord clamping (performed after 1 to 3 minutes after birth) is recommended for all births while initiating simultaneous essential newborn care. (Strong recommendation, moderate equality evidence)
8. Early cord clamping (<1 minute after birth) is not recommended unless the neonate is asphyxiated and needs to be moved immediately for resuscitation. (Strong recommendation, moderate-quality evidence)
9. Sustained uterine massage is not recommended as an intervention to prevent PPH in women who have received prophylactic oxytocin. (Weak recommendation, low-quality evidence)
10. Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women. (Strong recommendation, very-low-quality evidence)
11. Oxytocin (IV or IM) is the recommended uterotonic drug for the prevention of PPH in caesarean section. (Strong recommendation, moderate-quality evidence)
12. Controlled cord traction is the recommended method for removal of the placenta in caesarean section. (Strong recommendation, moderate-quality evidence)

WHO Recommendations for Active Management of the Third Stage of Labour (AMTSL), 2012[16]

The use of uterotonics for the prevention of postpartum haemorrhage (PPH) during the third stage of labour is recommended for all births.

Oxytocin (10 IU, IV/IM) is the recommended uterotonic drug for the prevention of PPH.

In settings where skilled birth attendants are available, controlled cord traction (CCT) is recommended for vaginal births if the care provider and the parturient woman regard a small reduction in blood loss and a small reduction in the duration of the third stage of labour as important.

In settings where skilled birth attendants are unavailable, CCT is not recommended.

Sustained uterine massage is not recommended as an intervention to prevent PPH in women who have received prophylactic oxytocin.

Postpartum abdominal uterine tonus assessment for early identification of uterine atony is recommended for all women.

CCT is the recommended method for removal of the placenta in caesarean section.

Frequently Asked Questions about New AMTSL Recommendations[16]

Does this mean that AMTSL is now something different or should be called by a new name?

No, it is not necessary to change the name or thinking about AMTSL, since the main components have not changed and AMTSL is so widely understood and practiced. Such a change might result in confusion that could slow down programme expansion. Instead, as programmes expand and improve the use of AMTSL, they should put greater emphasis on the first component, the administration of a uterotonic.

Should national policies regarding AMTSL now be changed?

National policies should continue to promote AMTSL and ensure that systems are in place to monitor and track its implementation. Policies should support the practice of AMTSL in all maternity facilities of the health system and by all cadres with midwifery skills. Policies should also direct the routine availability of high-quality oxytocin and encourage storage of oxytocin in a cool environment.

Should training materials and pre-service education programmes be amended to reflect the new recommendations?

Training and education programmes should continue to train providers in all the elements of AMTSL, since CCT and fundal massage remain important techniques that providers may need to perform in other situations, for example, in the management of retained placenta or PPH resulting from uterine atony. CCT decreases the time to the delivery of the placenta, and therefore ay be important in busy labour wards or for a single provider.

What does this mean for non-skilled providers?

Because of the clear evidence that the administration of a uterotonic is the most important component in AMTSL, ministries of health should put in place policies and programmes to ensure that every woman is offered a uterotonic immediately after birth—whether she delivers in a facility with a skilled provider or at home in the presence of a non-skilled provider. This can be done through the promotion of AMTSL in facilities and the development of community-based programmes for the use of misoprostol for women who deliver at home. These kinds of efforts can increase coverage to ensure that close to 100% of pregnant women are protected from lifethreatening PPH.

If we have a concern about the quality of oxytocin in our facilities, what should we do?

Oxytocin potency deteriorates when it is exposed to temperatures greater than 30°C for prolonged periods of time. For this reason, oxytocin should be distributed and stored along a “cool chain.” Oxytocin can be stored at room temperature in the labour unit for limited periods, as long as health managers routinely check and rotate stock and monitor drug quality.

A Refocused Approach to Prevention of PPH Using AMTSL[16]

Uterotonic Ensure that every woman is offered a uterotonic immediately after the delivery of the baby. Oxytocin is the preferred drug to prevent PPH.

Delayed cord clamping: Delay clamping the cord for at east 1-3 minutes to reduce rates of infant anaemia.

CCT: Perform CCT, if required.

Postpartum vigilance: Immediately assess uterine tone to ensure a contracted uterus; continue to check every 15 minutes for 2 hours. If there is uterine atony, perform fundal massage and monitor more frequently.

Oxytocin quality and supply: Ensure a continuous supply of high-quality oxytocin. Maintain the cool chain for oxytocin and remember that potency is reduced of oxytocin is exposed to heat for long periods.

the number of women who can be provided a uterotonic and thus be protected from PPH, and increase quality, by allowing programme managers and supervisors to focus on the most effective components in the package of care.

Conclusion:

The active management of the third stage of labour is recommended for every woman giving birth if there is to be an overall reduction in PPH and in manual removal of the placenta. However, it cannot significantly influence the incidence of severe PPH and blood transfusion following child birth.

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