

SECTION B

EVIDENCE BASE FOR
ACTIVE MANAGEMENT OF
THE THIRD STAGE
OF LABOR

INTRODUCTION

A growing body of evidence shows that active management of the third stage of labor can reduce the incidence of maternal morbidity and mortality in the world. This section contains a variety of information and tools that may be useful for advocacy and education of health care providers and policy makers.

Contents include:

- Summary of the evidence base
- Key published articles

SUMMARY OF THE EVIDENCE BASE FOR ACTIVE MANAGEMENT OF THE THIRD STAGE OF LABOR

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Postpartum hemorrhage (PPH) is the leading direct cause of maternal deaths in developing countries; with an estimated 14 million cases of pregnancy-related hemorrhage every year.¹

The majority of cases of PPH occur in the immediate postpartum period (within 24 hours after birth) and up to 90 percent of these are due to uterine atony, a failure of the uterus to properly contract after the child is born. As a result, bleeding from the uterus does not stop. Without immediate and proper medical attention, a woman with PPH is likely to die. Among anemic women, the loss of even a small amount of blood may have dire consequences. Although some factors have been associated with an increased incidence of uterine atony leading to PPH, two-thirds of the women who hemorrhage after childbirth have no identifiable risk factors.

Women who survive PPH are likely to suffer from anemia and other complications. These women often must receive blood transfusions and are susceptible to the associated risks of transfusion reactions or infection with HIV or hepatitis. Bleeding that cannot be controlled using drugs often requires surgery, including hysterectomy. Such procedures are costly and painful, and the resulting loss of fertility may be emotionally devastating. In addition, they carry the risk of infection, reaction to anesthesia and other complications.

Maternal mortality due to PPH is highest where there is poor access to skilled providers, transport systems, and emergency services. This is not surprising considering that a woman will die within two hours, on average, after the onset of PPH if she does not receive proper treatment (e.g., appropriate drugs, blood transfusion, or surgical intervention). Active management of third stage of labor is an effective measure to prevent PPH that can be delivered by trained health care providers linked with essential supplies in all the settings that women give birth, including home births.

Active Management of the Third Stage of Labor

Active management of the third stage of labor consists of a combination of interventions designed to speed the delivery of the placenta by increasing uterine contractions and to prevent PPH by averting uterine atony. The usual components are:

- Administration of uterotonic agent
- After the cord is clamped, placenta delivered by controlled cord traction with counter-traction on the fundus
- Uterine massage after delivery of the placenta as appropriate²

From 1988 through 1998, four good quality large-scale, randomized controlled studies conducted in well-resourced maternity hospitals (two in the United Kingdom and one each in the United Arab Emirates and Ireland) have compared the effects of active and expectant management of the third stage of labor.^{3,4,5,6}

Although the studies used different uterotonic drugs (oxytocin, ergometrine, either drug, or both drugs) with different dosages and routes of administration and varied in the components of active management, their results are informative. In all four studies, active management was associated with a decrease in PPH

(up to 70%) and a decrease in the length of the third stage of labor. A Cochrane Library systematic review and meta-analysis⁷ concluded that active management of the third stage of labor in the setting of a maternity hospital was superior to expectant management in reducing blood loss, postpartum hemorrhage and duration of the third stage. Active management of the third stage of labor also was associated with reduced postpartum anemia, decreased need for blood transfusion, and less use of additional therapeutic uterotonic drugs. Active management with ergometrine (compared to oxytocin), however, was associated with an increase in nausea, vomiting and hypertension. Other studies have suggested that there are no advantages or disadvantages for the newborn⁸ and uterotonic drugs are more effective in preventing PPH if they are administered before, rather than after, the placenta is delivered.⁵

Uterotonic Drugs

Routine administration of a uterotonic drug is an integral part of active management of the third stage of labor, and is suspected to have the greatest impact on the prevention of PPH. The effectiveness of injectable uterotonic drugs given in active management of the third stage of labor has been evaluated by a Cochrane Review.⁸ The systematic review compared ergometrine-oxytocin (syntometrine) with oxytocin alone in women having the third stage of labor managed actively. Six trials were included in the meta-analysis. Compared to oxytocin, ergometrine-oxytocin was associated with a small reduction in the risk of PPH. There was no difference seen between the groups using either five or 10 international units for blood loss equal to or greater than 1000 milliliters. Adverse effects of vomiting and hypertension were associated with the use of ergometrine-oxytocin. No significant differences were found in other maternal or neonatal outcomes⁸. Women with high blood pressure, pre-eclampsia, or eclampsia (which affect approximately 10% of all women) cannot use ergometrine. Oral oxytocin and oral ergometrine are not stable in tropical conditions.⁹

Misoprostol has been suggested as an alternative uterotonic drug for use in active management of the third stage of labor. Like other uterotonic agents, misoprostol causes the uterus to contract and thus can reduce postpartum bleeding. Misoprostol has a number of potential benefits including ease of administration (oral or rectal), low cost, and greater stability (stable at room temperature unlike conventional uterotonic drugs). In a Cochrane Review¹⁰ of randomized or quasi-randomized trials published before March 2002 comparing misoprostol to another uterotonic or no prophylactic uterotonic as part of management of the third stage of labor, oral misoprostol showed more blood loss compared to conventional injectable uterotonic agents. Side-effects included shivering and elevated body temperature¹⁰. Despite the lower effectiveness in preventing PPH, oral misoprostol may be a useful option in settings where women generally receive no injectable uterotonic drugs.^{11,12,13}

Injectable prostaglandins are associated with reduced blood loss when used in the third stage of labor when compared to oxytocin and ergometrine. However they have more side-effects (diarrhea, vomiting, and abdominal pain) and are generally more costly.¹⁰

Controlled Cord Traction

Training and guidelines are required for controlled cord traction to be performed safely. The potential maternal risks associated with controlled cord traction are the risk for the uterus to invert and for the cord to separate from the placenta. In the five major controlled trials on active versus expectant management, no cases of uterine inversion or cord separation were recorded.⁷

Implementation of Active Management of the Third Stage of Labor

As described above, the large, randomized studies in developed countries, and one large retrospective study in a rural hospital in Africa suggest a clear advantage of active management of the third stage of labor over expectant management in reducing PPH. Active management requires the presence of a skilled attendant at delivery, and can be successfully carried out in home, health center or hospital births. The fewer the medical services available at the birth site, the greater the potential benefit of active management of the third stage of labor in preventing PPH. In home births attended by skilled attendants in Indonesia, the use of oxytocin in a pre-filled single-dose injection device (Uniject™) has demonstrated several advantages over unbundled uterotonic drugs, syringes, and needles.¹⁴

The feasibility of widespread active management in specific developing countries requires consideration of the costs, storage and distribution requirements of drugs and supplies, the availability of trained personnel, and the quality of the health facilities.¹⁵

Conclusions

Numerous studies that have examined active management of the third stage of labor and individual active management components support the effectiveness and the need to expand the use of active management of the third stage of labor, especially in developing country settings.

REFERENCES

1. WHO. Mother-Baby Package. (WHO/RHT/MSM/94.11.Rev1.) Geneva: WHO; 1998.
2. International Confederation of Midwives and International Federation of Gynecology and Obstetricians. Joint Statement: Management of the Third Stage of Labour to Prevent Postpartum Haemorrhage. Available at: <http://www.internationalmidwives.org/Statements/Joint%20Statement%20Haemorrhage%20eng.htm>. Accessed June 2004.
3. Prendiville WJ, Harding JE, Elbourne DR, Stirrat GM. The Bristol third stage trial: active versus physiological management of the third stage of labour. *British Medical Journal* 1988; 297: 1295-1300.
4. Bagley C. A comparison of 'active' and 'physiological' management of the third stage of labour. *Midwifery* 1990; 6: 3-17.
5. Khan GQ, John IS, Wani S, Doherty T, Sibai BM. Controlled cord traction versus minimal intervention techniques in delivery of the placenta: a randomized controlled trial. *American Journal of Obstetrics and Gynecology* 1997; 177: 770-774.
6. Rogers J, Wood J, McCandlish R, Ayers S, Truesdale A, Elbourne D. Active versus expectant management of third stage of labour: the Hinchingsbrooke randomized controlled trial. *Lancet* 1998; 351: 693-699.
7. Prendiville WJ, Elbourne D, McDonald S. Active versus expectant management in the third stage of labour (Cochrane Review). In: *The Cochrane Library*, Issue 1, 2003. Oxford: Update Software.
8. McDonald S, Prendiville WJ, Elbourne D. Prophylactic syntometrine versus oxytocin for delivery of the placenta (Cochrane Review). In: *The Cochrane Library*, Issue 1, 2003. Oxford: Update Software.
9. de Groot AN, Vree TB, Hogerzeil HV, Walker GJ. Stability of Oral Oxytocics in Tropical Climates. (WHO/DAP/94.13.) Geneva: WHO, 1994.
10. Gulmezoglu AM, Forna F, Villar J, Hofmeyr GJ. Prostaglandins for prevention of postpartum hemorrhage (Cochrane Review). In: *The Cochrane Library*, Issue 1, 2003. Oxford: Update Software.
11. Darney PD. Misoprostol: a boon to safe motherhood...or not? [Commentary]. *Lancet* 2001; 358:682-683.
12. Goldberg AB, Greenberg MA, Darney PD. Misoprostol and pregnancy. *New England Journal of Medicine* 2001; 344:38-47.
13. Carpenter JP. Misoprostol for Prevention of Postpartum Hemorrhage: An Evidence-Based Review by the US Pharmacopeia, Rockville, Maryland: United States Pharmacopeia, 2001.
14. PATH, WHO/Indonesia, and Ministry of Health/Indonesia. Oxytocin in Pre-Filled Uniject™ Injection Devices for Management of Third Stage of Labor: An Introductory Trial in Lombok, Indonesia Final Report. Seattle, Washington: PATH. May 2001.
15. Caroli G. Active versus expectant management in the third stage of labour (WHO Reproductive Health Library Commentary, Nov. 17, 2000). In: *The Cochrane Library*, Issue 4, 2001. Oxford: Update Software.

