The effect of Misoprostol in the prevention of Post-partum hemorrhage in sub-Saharan Africa

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Abstract

Introduction: Postpartum hemorrhage (PPH) is the leading cause of maternal death worldwide. Oxytocin is the uterotonic drug of choice to prevent PPH. This systematic review was performed to evaluate the use of misoprostol as a possible alternative in resource-poor settings.

Methods: Articles were selected on PubMed and the International Journal of Obstetrics and Gynecology based on their primary outcomes (estimated blood loss (EBL) in mL), region (Sub-Saharan Africa) and purpose (comparing (1) misoprostol with oxytocin or with a controlled placebo (2) and different doses of misoprostol). All meta-analyses used a Cohen's D scale.

Results: There was no difference between the use of oxytocin over misoprostol and meta-analysis shows that when used separately, both medications decreased total EBL. Misoprostol at 400 and 600 mcg did not show any difference on EBL compared to oxytocin. In combination with oxytocin, there was no difference on EBL compared to misoprostol alone. When oxytocin was not added to misoprostol, there also was no difference on EBL compared to misoprostol alone.

Conclusion: This study suggests that misoprostol may be a sustainable alternative to prevent PPH in resource-poor areas where oxytocin is unavailable.

Introduction

According to the World Health Organization (WHO), approximately 800 women die every day due to preventable causes related to pregnancy and childbirth[1].

The main causes of maternal deaths worldwide include postpartum hemorrhages (PPH, 22.3%), hypertensive disorders during pregnancy (pre-eclampsia and eclampsia, 18.5%) and unsafe abortions (approximately 14.5%)[1].

The American College of Obstetricians and Gynecologists recently revised the definition of PPH as a "cumulative blood loss greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process (includes intrapartum loss) regardless of route of delivery". Uterine atony accounts for at least eighty percent of PPH[2].

Oxytocin (IM/IV, 10 IU)[3], a hormone that naturally induces uterine contractions after birth is the gold standard for the prevention of PPH. The use and feasibility of oxytocin in developing countries remains very limited because of its storage and administration protocols (i.e. requires a skilled health provider, cold chain storage and sterile syringes and needles)[4-5].

Misoprostol, a synthetic prostaglandin E1 analogue, has been proven to have sustainable advantages over oxytocin including multiple route of administration (oral, sublingual, vaginal, rectal, buccal), a reasonable cost, and a long shelf life at room temperature[6].

Methods

Articles were selected on PubMed and the International Journal of Obstetrics and Gynecology based on their primary outcomes (estimated blood loss (EBL) in mL), region (Sub-Saharan Africa) and purpose (comparing (1) misoprostol with oxytocin or with a controlled placebo (2) and different doses of misoprostol) (**Fig. 1**).
All meta-analyses used a Cohen's D scale (**Fig. 2, Fig. 3, Fig. 4).**

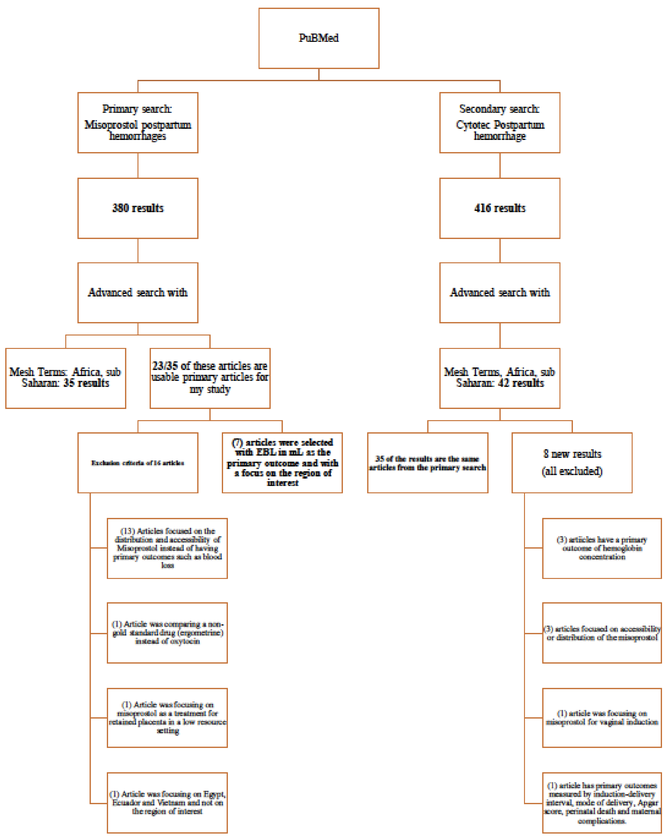

***Figure 1**: Key search strings*

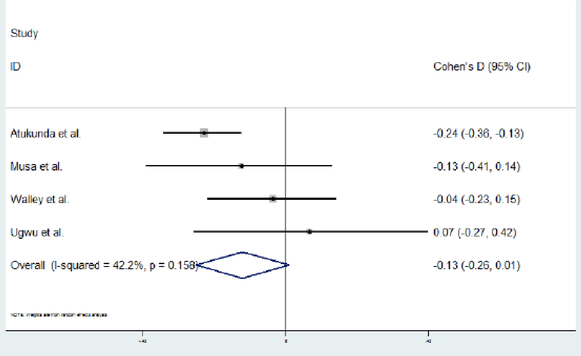

***Figure 2:** Meta-analysis comparing oxytocin vs. misoprostol*

Results

Results from all meta-analyses were not statistically significant.
There was no difference between the use of oxytocin over misoprostol [-0.13 (95% CI -0.26, 0.01)] and meta-analysis shows that when used separately, both medications decreased total EBL **(Fig. 2).** Misoprostol at 600 mcg [-0.22 (95% CI -0.33, -0.12)] and at 400 mcg [-0.01 (95% CI -0.18, 0.15)] did not show any difference on EBL compared to oxytocin (**Fig. 3**). When combining oxytocin and misoprostol, there was no difference on EBL compared to misoprostol alone [-0.13 (95% CI -0.42, 0.16)]. When oxytocin was not added to misoprostol, there also was no difference on EBL compared to misoprostol alone [-0.07 (95% CI -0.22, 0.09) (**Fig. 4**).

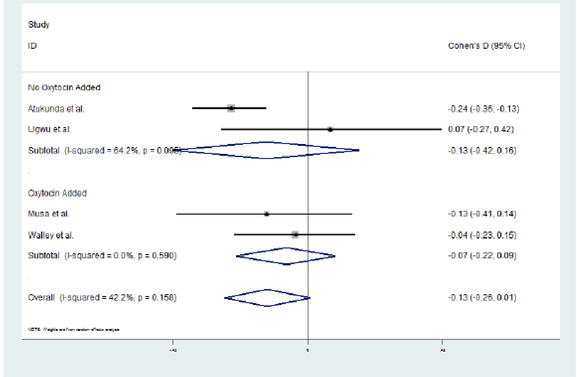

***Figure 3**: Misoprostol (400 mcg, 600 mcg) vs oxytocin*

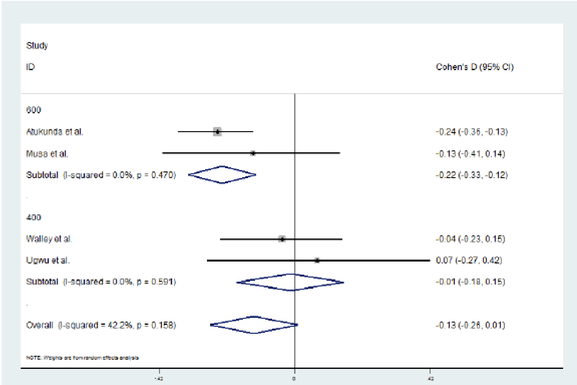

***Figure 4**: Combination of oxytocin and misoprostol vs. oxytocin alone*

Discussion and Conclusions

There is no statistical difference when comparing the use of oxytocin, misoprostol or a combination of oxytocin plus misoprostol on postpartum EBL. This study suggests that misoprostol may be a sustainable alternative to prevent PPH in resource-poor areas where oxytocin is unavailable.

References:

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