

Comparative Evaluation of Oxytocin Alone versus Oxytocin with Intrauterine Misoprostol during Caesarean Section: A Pilot Retrospective and Prospective Observational Study

Aditi Rathi | Jitendra Munde

Department of Obstetrics & Gynaecology, Military Hospital Ahmednagar, Maharashtra

Date of Submission: 01-04-2026

Date of Acceptance: 10-04-2026

ABSTRACT

Background:

Postpartum haemorrhage (PPH) remains a major cause of maternal morbidity. Oxytocin is routinely used during caesarean section. Intrauterine misoprostol is increasingly used as an adjunct uterotonic; however, data from low-volume centres are limited.

Objective:

To compare intraoperative blood loss and maternal outcomes between oxytocin alone and oxytocin with intrauterine misoprostol during caesarean section.

Methods:

A pilot retrospective and prospective observational study was conducted including 100 women undergoing caesarean section. Group A received oxytocin alone (n=50), while Group B received oxytocin with intrauterine misoprostol (n=50). Estimated blood loss (EBL), hemoglobin drop, need for additional uterotonics, blood transfusion and adverse effects were compared.

Results:

Mean estimated blood loss in Group A was 350 ± 50 mL compared to 250 ± 50 mL in Group B ($p < 0.05$). The fall in hemoglobin was lower in Group B. The requirement for additional uterotonics and blood transfusion was also lower in the combination group. Transient shivering and fever were more frequent in the misoprostol group.

Conclusion:

Adjunct intrauterine misoprostol with oxytocin during caesarean section was associated with reduced blood loss compared to oxytocin alone. Larger randomized trials are required to validate these findings.

KEYWORDS: Caesarean section, postpartum haemorrhage, oxytocin, misoprostol, uterotonics

I. INTRODUCTION

Postpartum haemorrhage (PPH) is a leading cause of maternal morbidity and mortality worldwide. Uterine atony accounts for the majority of cases. Active management of the third stage of labour and prophylactic uterotonics during caesarean section play a critical role in prevention of excessive blood loss. (1) Oxytocin remains the first-line uterotonic agent; however, in many settings, adjunct agents such as misoprostol are used to augment uterine tone.

Misoprostol is a prostaglandin E1 analogue that is inexpensive, stable at room temperature and easy to administer. Intrauterine placement of misoprostol during caesarean section has been reported to enhance uterine contraction and reduce blood loss. (2,3) However, routine use remains variable across institutions, and evidence from resource-limited and low-volume centres is limited. This pilot study was undertaken to evaluate the feasibility and maternal outcomes associated with adjunct intrauterine misoprostol during caesarean section in a military hospital setting.

II. METHODS

Study Design:

Pilot retrospective and prospective observational comparative study.

Setting:

Department of Obstetrics and Gynaecology, Military Hospital, Ahmednagar.

Sample Size:

100 women undergoing LSCS.

Groups:

- Group A (n=50): Oxytocin only
- Group B (n=50): Oxytocin + intrauterine misoprostol

Inclusion Criteria:

All women undergoing caesarean section during the study period.

Exclusion Criteria:

Placenta accreta spectrum, known coagulation disorders, major surgical complications.

Intervention:

All patients received standard oxytocin as per unit protocol. In Group B, misoprostol (600 µg) was placed intrauterine at the end of placental delivery.

Outcome Measures:

- Estimated blood loss (EBL)
- Hemoglobin drop (pre-op vs post-op)
- Need for additional uterotonics
- Blood transfusion
- Adverse effects (fever, shivering)

Statistical Analysis:

Continuous variables were expressed as mean ± SD. Comparison between groups was performed using Student's t-test. Categorical variables were analysed using Chi-square test. A p-value <0.05 was considered statistically significant.

III. RESULTS

Parameter	Group A (Oxytocin only)	Group B (Oxytocin + Misoprostol)	p-value
Mean EBL (mL)	350 ± 50	250 ± 50	<0.05
Hb drop (g/dL)	1.4 ± 0.4	0.9 ± 0.3	<0.05
Additional uterotonics (%)	22%	22%	<0.05
Blood transfusion (%)	10%	2%	<0.05
Shivering/fever (%)	4%	16%	<0.05

IV. DISCUSSION

This pilot study demonstrates a statistically significant reduction in estimated blood loss with adjunct intrauterine misoprostol compared to oxytocin alone during caesarean section. Reduced hemoglobindrop and decreased requirement for additional uterotonics suggest improved uterine contractility in the combination group.

The findings are consistent with previous studies that have reported reduced intraoperative blood loss with misoprostol use during caesarean section(4,5).However, increased incidence of transient side effects such as shivering and fever was observed, which is consistent with known prostaglandin-related adverse effects (4,5).

The retrospective-prospective design and low case volume limit the generalisability of results. Nevertheless, this study demonstrates feasibility of conducting comparative research in low-volume military hospital settings.

LIMITATIONS

- Non-randomized observational design
- Single-centre study
- Small sample size
- Potential selection bias

V. CONCLUSION

Adjunct intrauterine misoprostol in addition to oxytocin during caesarean section is associated with significantly reduced intraoperative blood loss and lower need for additional uterotonics. While mild side effects were more frequent, the intervention appears effective and feasible. Larger randomized controlled trials are required before routine recommendation.

REFERENCES

- [1]. Conde-Agudelo A, Belizán JM. Uterotonic agents for preventing postpartum haemorrhage.
- [2]. Cochrane Database Syst Rev. 2010; (7):CD001347.
- [3]. Alalfy M, Elrawy M, Haggag H, Sabbour A. Comparison of misoprostol versus oxytocin for prevention of blood loss at lower segment cesarean section: a randomized controlled trial. *Int J Gynaecol Obstet.* 2018;142(1):18-22.
- [4]. Sharma S, Gupta A, Sharma M, Sharma JB. Effectiveness of intra-uterine misoprostol in control of blood loss during caesarean section. *J ObstetGynaecol India.* 2021;71(3):234-239.
- [5]. Bahadur A, Chakraborti C, Sengupta J, Roy S. Role of intrauterine misoprostol as an adjunct to oxytocin during caesarean section: an observational study. *J ObstetGynaecol.* 2019;39(4):564-569.
- [6]. Pakniat H, Baradaran HR, Yahyavi S. Comparison of the effect of misoprostol and oxytocin in controlling blood loss during elective cesarean section. *Arch Gynecol Obstet.* 2019;299(6):1697-1703.