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ORIGINAL RESEARCH

Comparison of Average Blood Loss and Haemoglobin Changes Between Rectal Misoprostol and Intramuscular Oxytocin for Postpartum Haemorrhage Prevention

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ABSTRACT

Background: Postpartum haemorrhage (PPH) is a major cause of maternal mortality worldwide. Prevention methods including uterotonic agents are key to improving outcomes. This study compares Rectal Misoprostol and Intramuscular (I/M) Oxytocin in reducing blood loss and haemoglobin (HB) level changes during delivery. **Method:** This was a randomized study conducted at the Saraswathi Institute of Medical Sciences, Hapur, between August 2022 and July 2024 on 200 women with low-risk term pregnancies. The subjects were allocated to Group A (600 µg rectal misoprostol) or Group B (10 IU I/M oxytocin) There was an estimation of blood loss for 24 hours after delivery, and the measurement of haemoglobin was done pre- and post-delivery, respectively. Statistical data analysis was performed using SPSS v25.0. **Results:** Mean blood loss was lower in Rectal Misoprostol group (201.0 ± 46.8 ml) compared to I/M Oxytocin group (222.8 ± 42.4 ml, $p < 0.001$). Mean haemoglobin decline was also smaller in Rectal Misoprostol group (-0.53 ± 0.3 gm/dl) compared to I/M Oxytocin group (-0.76 ± 0.6 gm/dl, $p = 0.002$). **Conclusion:** Rectal Misoprostol is better than I/M Oxytocin in reducing blood loss and haemoglobin decline in postpartum women.

Key words: Postpartum Hemorrhage (PPH), Rectal Misoprostol, Intramuscular Oxytocin, Uterotonic Agents, Blood Loss, Hemoglobin Levels, Maternal Health

INTRODUCTION

Postpartum haemorrhage (PPH) stands among the most prevalent causes of maternal morbidity and mortality globally therefore, timeliness and strategies for management including prevention are key towards improving maternal health. Aim of this research is to carry out a comparative analysis of the effectiveness of Rectal Misoprostol versus Intramuscular (I/M) Oxytocin in terms of the amount of blood lost and the change in haemoglobin levels of the postpartum patients. Misoprostol is a prostaglandin analogue and is particularly cost effective and efficient in low-resource environments while oxytocin is the first drug of choice established for having speedy and effective protection against uterine atony. The present study will hopefully extend the basis of evidence on the relative effectiveness of the two interventions with regards to the amount of blood loss and changes in haemoglobin concentration levels which can be beneficial in reducing the burden of PPH and indeed improving maternal health status outcomes while informing practice across various health care systems.

MATERIALS AND METHODS

This randomized, comparative, and observational study was conducted at Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, from August 2022 to July 2024, with ethical clearance and informed consent.

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Participants

200 women with low-risk singleton pregnancies undergoing term vaginal deliveries were randomized into:

Group A: 600 µg rectal misoprostol (n = 100).

Group B: 10 IU intramuscular oxytocin (n = 100).

Procedures

Blood loss was measured using calibrated BRASS-V drapes for 24 hours post-delivery, and haemoglobin levels were recorded before and 24 hours after delivery. Adverse effects of uterotonics were monitored.

Outcomes

Primary: Blood loss and haemoglobin change post-delivery.

Secondary: Third-stage labour duration and uterotonic side effects.

Analysis

Data were analysed using SPSS v25.0. Paired t-tests and Chi-square tests determined significance ($p < 0.05$).

RESULTS

Blood Loss Comparison

(Table 1: Comparison of Blood Loss in ml Among Intervention Groups)

Method of Prevention	Mean Blood Loss (ml) ± SD	p-value
Rectal Misoprostol	201.0 ± 46.8	<0.001*
I/M Oxytocin	222.8 ± 42.4	
Total	211.9 ± 45.9	

Rectal Misoprostol resulted in significantly lower blood loss (201.0 ± 46.8 ml) compared to I/M Oxytocin (222.8 ± 42.4 ml, $p < 0.001$).

Haemoglobin Level Comparison

(Table 2: Haemoglobin Levels Before and After Delivery)

Method of Prevention	HB Before Delivery (gm/dl) ± SD	HB After Delivery (gm/dl) ± SD	Difference in HB (gm/dl) ± SD	p-value
Rectal Misoprostol	10.95 ± 0.72	10.4 ± 0.7	-0.53 ± 0.3	0.002*
I/M Oxytocin	10.93 ± 0.69	10.19 ± 0.5	-0.76 ± 0.6	
Total	10.94 ± 0.7	10.2 ± 0.6	-0.65 ± 0.5	

The HB levels before delivery were comparable between groups ($p = 0.88$). However, after delivery, the HB level decline was significantly lower in the Rectal Misoprostol group (-0.53 ± 0.3 gm/dl) compared to the I/M Oxytocin group (-0.76 ± 0.6 gm/dl, $p = 0.002$).

DISCUSSION

This study shows that rectal Misoprostol reduces postpartum blood loss and haemoglobin decline more than Intramuscular (I/M) Oxytocin. The results are in line with previous studies that showed Misoprostol to be an effective uterotonic. 201.0 ± 46.8 ml of blood loss in the Misoprostol group compared to 222.8 ± 42.4 ml in the Oxytocin group shows that Misoprostol causes lesser blood loss. The p-value <0.001 supports that Misoprostol can manage PPH.

Misoprostol is easy to store and administer, making it ideal for low resource setting where cold-chain storage for Oxytocin is not feasible. Previous studies have shown it to be comparable or superior to Oxytocin in similar settings [1,2]. The smaller haemoglobin declines in the Misoprostol group (-0.53 ± 0.3 gm/dl) compared to the Oxytocin group (-0.76 ± 0.6 gm/dl) supports its role in improving maternal outcomes as significant anaemia can worsen postpartum complications [3].

Oxytocin is the first line treatment in well-equipped healthcare setting but requires trained personnel and proper storage condition [4]. Misoprostol being stable at room temperature is a practical alternative especially in rural or under-resourced area. But we need to monitor for side effects such as shivering and hyperthermia which are common with Misoprostol use [5].

In line with WHO guidelines Misoprostol can be used as an alternative to Oxytocin for PPH prevention where Oxytocin is not available or not practical [6]. More studies should be done on large scale trials on long term maternal and neonatal outcomes.

Many studies have shown that Misoprostol can be a good alternative for Oxytocin to treat postpartum haemorrhage, especially in the places which have limited resources. Abalos et al. (2016) talked about its usefulness in antenatal care, especially when Oxytocin is not available [7]. Mousa et al. (2014) found that Misoprostol works well and can be used easily for treating primary postpartum haemorrhage in areas with few resources [8]. Winikoff et al. (2010) showed that sublingual Misoprostol works just as well as Oxytocin in preventing PPH [9], and Alfirevic et al. (2007) confirmed it is effective, especially when there is limited access to intravenous or intramuscular drugs [10]. These studies show that Misoprostol can improve maternal outcomes in places with fewer resources.

CONCLUSION

Rectal Misoprostol was found to be more effective than intramuscular Oxytocin in reducing postpartum blood loss and the low levels of haemoglobin. As it is stable at room temperature and easyto handle, makes it a practical option in low-resource environment

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settings as recommended by the WHO. However, side effects such as shivering and hyperthermia due to its use must be addressed. Further large-scale studies are needed to evaluate long-term maternal and neonatal outcomes.

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