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**ORIGINAL RESEARCH**

# Comparison study of various oxytocics in management of third stage of labour

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## ABSTRACT

**Introduction –** The primary factors contributing to maternal mortality are hemorrhages, infections, botched abortions, and obstructed labor. 25% of these cases are attributed to haemorrhages and can be prevented. One effective intervention is the active management of the third stage of labor (AMTSL). The purpose of this study was to examine the importance of oxytocics in preventing postpartum hemorrhage and to assess the effectiveness of different medicines in managing the third stage of labor. **Material and methods-** The present prospective study was conducted at department of obstetrics and gynecology of a tertiary care centre among 100 pregnant women during the study period of one year. Four group were made on the basis of oxytocic drug given. Results were analyzed using SPSS version 25.0. **Results-** There was no statistically significant difference in the average amount of blood loss across the groups when considering factors such as parity and type of labor. Based on the current research, it appears that no oxytocic medication has demonstrated superiority over others in lowering blood loss. Misoprostol has a varying time period before it begins to take effect. The average duration of the third stage is consistent across different groups. Regarding side effects, group I and II the most common side effect was temperature and in group III and IV was nausea. **Conclusion-** The study determined that all uterotonics possess certain benefits, however, oxytocin is considered the optimal medication of choice in the hands of a professional practitioner due to its precise and immediate commencement of action.

**Keywords** – active management, hemorrhage, oxytocic, pregnancy, third stage



## INTRODUCTION

The third stage of labour is the period from the delivery of the baby to the removal of the placenta. After the baby is delivered, the muscles of the uterus contract, causing the placenta to gradually separate and be expelled. Additionally, the uterine muscles flex around the maternal blood vessels in the area where the placenta was attached. The maternal coagulation system is activated simultaneously. The extent of blood loss after childbirth is mostly determined by the speed and effectiveness of these processes.[1]

Postpartum hemorrhage is a frequently occurring complication in obstetrics during thirs satge of labour and is a leading cause of maternal illness and death. Additionally, it is a prominent factor contributing to maternal morbidity and mortality that can be preventable. If not handled, it can happen suddenly, is often unexpected, and can result in the death of the mother [2]. Globally, it is estimated that approximately 11% of women who give birth to a live infant experience severe postpartum hemorrhage (PPH). In underdeveloped nations, where a considerable number of women do not have access to a skilled birth attendant and the practice of actively managing the third stage of labor is not widespread, the estimated rate of complications during childbirth is expected to be notably higher. Approximately 14 million women experience postpartum hemorrhage, resulting in a substantial blood loss. Tragically, 1% of these women do not survive as a consequence [3,4]

Techniques to prevent PPH may target any aspect of the third stage of labour. A recent review determined that active management of the third stage of labour (AMTSL), defined as prophylactic administration of a uterotonic, early umbilical cord clamping and controlled cord traction, decreases the risk of blood loss greater than 1000 mL [5]. According to recent assessments of the several parts of the Active Management of the Third Stage of Labor (AMTSL), the World Health Organization (WHO) considers controlled cord traction to be optional, typically advises against early cord clamping, and recommends uterotonics as the primary intervention that should be offered to all women during the third stage of labor. Oxytocin is currently regarded as the preferred uterotonic by the WHO and other organizations.[6]

Various oxytocics such as Oxytocin, Methylergometrine, Misoprostol, and Prostaglandins

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F2α are available for the prevention and treatment of postpartum bleeding.

Several randomized controlled trials have been conducted to assess the effectiveness of medications.[7]

The purpose of this study was to examine the importance of oxytocics in preventing postpartum hemorrhage and to assess the effectiveness of different medicines in managing the third stage of labor.

## MATERIAL AND METHODS

The present prospective study was conducted at department of obstetrics and gynecology, GMC, Jammu among pregnant women during the study period of one year. Ethical clearance was taken from institutional ethics committee before commencement of study. Patients were asked to sign an informed consent form after explaining them the complete procedure.

Through convenient sampling a total of 100 pregnant women at term pregnancy were selected on the basis of inclusion and exclusion criteria.

**Inclusion criteria**

- All pregnant women with low risk conditions who come to the obstetrics and gynecology department of our institute.
- Patients must be open to receiving treatment with different oxytocics.
- Patients must be prepared to stay in the hospital for 24 hours following childbirth.
- Consent for surgical operations is assumed, discussed, and acknowledged in the event of complications or heavy bleeding.
- Patients should be prepared to undergo hemoglobin estimation before and after childbirth.

**Exclusion criteria**

- Patients with hemoglobin less than 8 gm.
- Patient landing in traumatic PPH.
- Hydramnios, malpresentation.
- Antepartum eclampsia.
- Pre-eclampsia and eclampsia.
- Grand multipara.
- Multiple pregnancy.
- Coagulation abnormalities.
- Medical disorders during pregnancy.
- Previous caesarian section.

Patients were randomly divided into four groups (n=25) on the basis of oxytocics given after the delivery of baby i.e.

Group I- patients received Tab Misoprostol 600 mcg per rectally.

Group II- patients received Inj. Oxytocin 10 IU intramuscular .

Group III- patients received Inj. Methylergometrine 0.2 mg intramuscular.

Group IV- patients received Inj. PGF2α 250 µg.

Following the administration of medications, the duration of placental delivery was recorded and the quantity of blood loss was assessed for each patient. Any side effects that happened were documented. The study did not report any significant adverse effects. The study examined the differences in pre and post-delivery levels of haemoglobin and blood loss in each group.

The mean and standard deviation were computed, and a statistical analysis was conducted using SPSS version 25.0, specifically employing the ANOVA test. The threshold for statistical significance was set at $p<0.05$.

## RESULTS

The average blood loss in each group is shown in table 1. There was no significant difference in mean blood loss in all oxytocic groups (p=0.97).

**Table: 1 Comparison of mean blood loss in all groups**

| Variable | Group I | Group II | Group III | Group IV | P value |
|---|---|---|---|---|---|
| Mean blood loss | 320.89±231.45 | 318.8±180.21 | 321.4±198.4 | 317.4±123.5 | 0.97 |

In primigravida patients the mean blood was almost equal in group I, II, and III, but slightly lower in group IV. The p-value was also not significant, indicating no meaningful difference. The average amount of blood loss was also similar across all groups, with a non-significant p-value. These findings were consistent in patients with second, third, and fourth pregnancies. Therefore, there was no significant variation in the amount of average blood loss among all groups based on parity. In the present study, 74 had spontaneous onset of labor and 26 patients required induction of labor but there was practically no significant difference in amount of mean blood loss in each group irrespective of whether the labor was spontaneous or induced (p>0.05) as shown in table 2.

**Table: 2 Comparison of parity and type of labour to mean blood loss in all groups**

| Variable | Group I | | Group II | | Group III | | Group IV | | P value |
|---|---|---|---|---|---|---|---|---|---|
| | n | Mean blood loss | n | Mean blood loss | n | Mean blood loss | n | Mean blood loss | |
| Para 1 | 9 | 318.13±234.2 | 10 | 321.03±265.1 | 9 | 318.14±189.2 | 7 | 315.33±58.2 | 0.98 |
| Para 2 | 12 | 320.33±214.1 | 11 | 318.13±236.4 | 13 | 311.43±190.3 | 15 | 321.03±245.2 | 0.85 |
| Para 3 | 3 | 320.45±212.7 | 2 | 330.03±200.2 | 2 | 334.03±192.2 | 2 | 316.43±80.32 | 0.94 |
| Para 4 | 1 | 338.23±224.2 | 2 | 320.63±214.2 | 1 | 310.12±134.2 | 1 | 308.43±178.2 | 0.92 |

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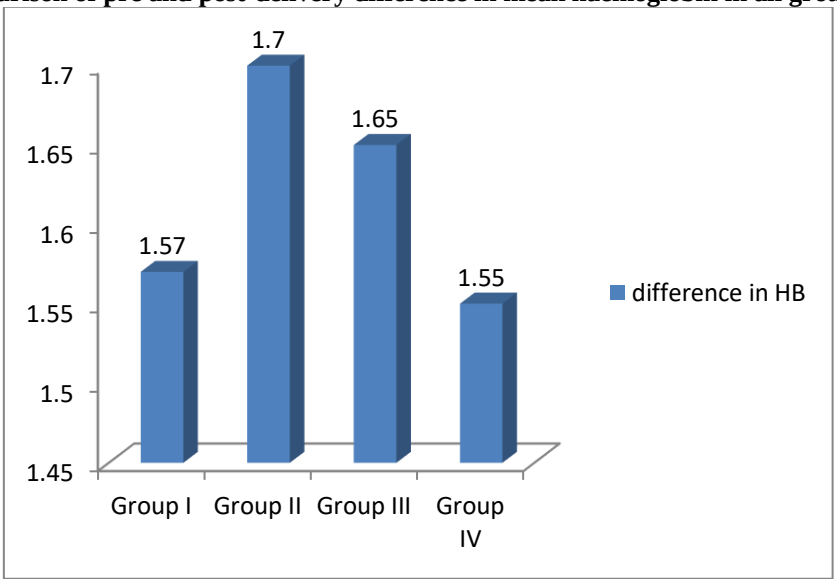
|---|---|---|---|---|---|---|---|---|---|
| Spontaneous | 17 | 315.03±245.2 | 18 | 314.87±201.2 | 20 | 317.36±209.2 | 19 | 313.13±.145.2 | 0.98 |
| Induced | 8 | 332.13±244.2 | 7 | 314.43±167.2 | 5 | 343.45±234.2 | 6 | 330.93±67.2 | 0.70 |

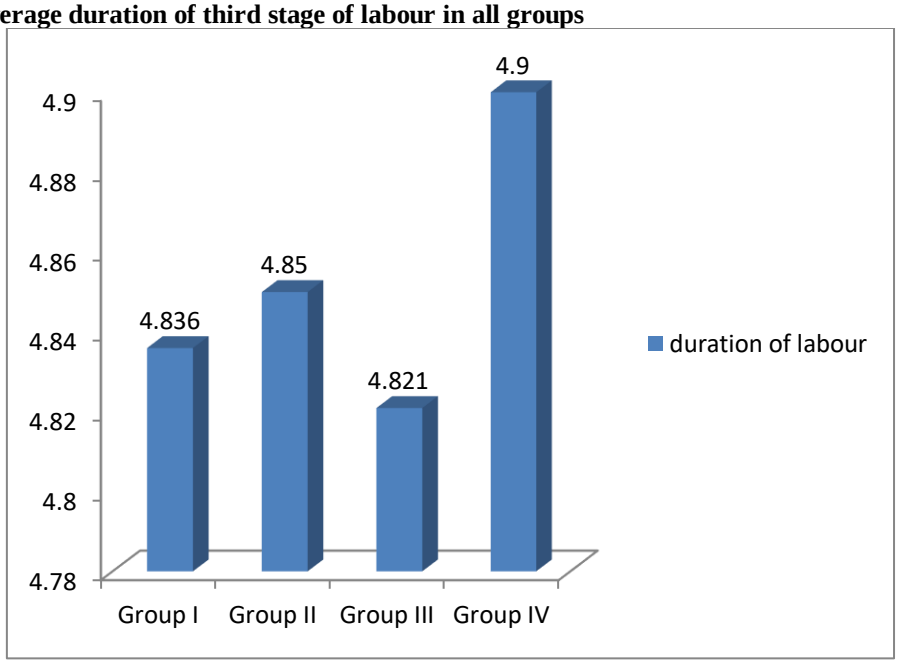
The difference in pre and post-delivery mean hemoglobin in group I, II, III and IV was 1.57±.05, 1.7±0.63, 1.65±0.97, 1.55±0.67 respectively and the difference was statistically non-significant (p>0.05) which indicate that blood loss may be not significant as shown in figure 1.

**Figure: 1 Comparison of pre and post-delivery difference in mean haemoglobin in all groups**




Average duration of third stage was calculated in all patients in all groups mean duration (minutes) of third stage was 4.836±1.89, 4.850±2.23, 4.821±1.13 and 4.9±1.5. There was no significant difference in duration of third stage of labor in all groups (p>0.05) as shown in figure 2.

**Figure: 2 Average duration of third stage of labour in all groups**




The adverse effect found in all patients were Nausea (16), vomiting (8), shivering (7), diarrhea (8), headache (10), temperature (14) and hypertension (4) as shown in table 3.

**Table: 3 Adverse effects in all groups**

| Adverse effects | Group I | Group II | Group III | Group IV | Total |
|---|---|---|---|---|---|
| Nausea | 4 | 3 | 5 | 4 | 16 |
| Vomiting | 3 | 1 | 3 | 1 | 8 |

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| | | | | | |
|---|---|---|---|---|---|
| Shivering | 2 | 1 | 2 | 2 | 7 |
| Diarrhea | 3 | 2 | 1 | 2 | 8 |
| Headache | 2 | 4 | 1 | 3 | 10 |
| Temperature | 6 | 5 | 0 | 3 | 14 |
| Hypertension | 1 | 0 | 1 | 2 | 4 |

## DISCUSSION

The World Health Organization (WHO) and other specialized authority have widely defined postpartum hemorrhage (PPH) as blood loss from the vaginal tract of 500 mL or more within 24 hours of delivery. Nonetheless, a number of recommendations and definitions for PPH are now in use, and no single definition has been accepted globally. A major problem that makes the use of blood loss criteria to establish PPH more difficult is the difficulty in quantifying blood loss. [8]

The careful use of oxytocics and aggressive management of the third stage of labor are highly advised by modern obstetrics, particularly for women who are at risk. Regular usage of oxytocics reduces the risk of PPH by forty percent.[9] The present study was done 100 women divided into 4 groups to examine the importance of oxytocics in preventing postpartum hemorrhage and to assess the effectiveness of different medicines in managing the third stage of labor.

The four different oxytocic given were Tab Misoprostol 600 mcg , Inj. Oxytocin 10 IU, Inj. Methylergometrine 0.2 mg and Inj. PGF2α 250 µg.

In the present study there was no significant loss of mean blood among four groups. Studies by Rao et al, Sultan et al, and Parson et al showed comparable outcomes.[10-12] Only the studies by Megha et al. and Alam et al. demonstrate a statistically significant variation in blood loss.[13,14] in a study done by Sharmila K There is statistical significance among the means of the two groups pertaining to the blood loss during third stage of labour.[15]

In our study the difference in pre and post-delivery mean hemoglobin in group I, II, III and IV was 1.57±.05, 1.7±0.63, 1.65±0.97, 1.55±0.67 respectively and the difference was statistically non-significant ($p>0.05$). Ina study done by Sharmila K the fall in Hb% was as follows; In group I, 54% of the cases had Hb difference of< 0.5 gm. In group II, 61% of the cases had Hb difference of 0.6-lgm. [15] Similar results were seen in Parson et al and Alam et al. [12, 14]

There was no significant difference in duration of third stage of labor in all groups ($p>0.05$) in our study. In a study conducted by Alam et al, there was a notable distinction observed between group A and B, as well as between group A and C. However, no significant difference was found between group B and C.[14] Conversely, in a study conducted by Megha et al, there was a significant difference in the duration of the third stage of labor between the misoprostol and methylergometrine groups, with a p-value of less than 0.05.[13]

In the present study in group I and II the most common side effect was temperature and in group III and IV was nausea. In a study done by Sharmila K, shivering 2, nausea 10, vomiting 9, and hypertension 5 were all reported in the methergine group in the study. Shivering 3, nausea 1, vomiting, and hypertension 1 were observed in the oxytocin group. These adverse effects were temporary and did not necessitate any treatment. In the study conducted by Rao et al., it was shown that nausea and vomiting were more prevalent in patients treated with methergin and PGF2α, whereas shivering and fever were associated with misoprostol.[10] Additionally, diarrhea was observed in patients treated with PGF2α, which is consistent with the findings of the present investigation. A study conducted by Sultana et al found that shivering was more prevalent with the use of misoprostol compared to oxytocin, and this difference was statistically significant.[11]

The limitations were it was a single centre study with a limited period of time and also sample size was less hence a study with multiple center a large sample size is recommended for generalizing the results.

## CONCLUSION

A study has determined that all uterotonics are equally effective in preventing postpartum hemorrhage. However, the choice of administering oxytocics depends on factors such as storage requirements, route of administration, side effects, contraindications, and cost. Therefore, the injection method should be considered. Oxytocin is the optimal drug to use in expert hands since it has a clear and certain onset of action. On the other hand, Misoprostol can be used as a supplementary drug because its commencement of action may vary, but its length of activity is definite.

## REFERENCES

1. Salati JA, Leathersich SJ, Williams MJ, Cuthbert A, Tolosa JE. Prophylactic oxytocin for the third stage of labour to prevent postpartum haemorrhage. Cochrane Database of Systematic Reviews. 2019; 4: CD001808.
2. Creanga AA, Syverson C, Seed K, Callaghan WM. Pregnancy-related mortality in the United States, 2011-2013. Obstet Gynecol. 2017;130(2):366-373.
3. Callaghan WM, Kuklina EV, Berg CJ. Trends in postpartum hemorrhage: United States, 1994-2006. Am J Obstet Gynecol. 2010;202:353.e1-6.
4. Reale S, Easter SR, Xu X, et al. Trends in postpartum hemorrhage in the United States from 2010-2014. Poster presented at: Society for Obstetric Anesthesia and Perinatology SOAP Menard MK, Main EK, Currigan SM. Executive summary of the reVITALize initiative: standardizing obstetric data definitions. Obstet Gynecol. 2014;124:150-153.

DOI: 10.69605/ijlbpr_13.8.2024.4

5. Begley CM, Gyte GML, Devane D, McGuire W, Weeks A, Biesty LM. Active versus expectant management for women in the third stage of labour. Cochrane Database of Systematic Reviews. 2019;2.
6. World Health Organization. WHO recommendations for the prevention of postpartum haemorrhage. https://afro.who.int/ sites/default/files/2017-06/WHO_MPS_0706_engPPH.pdf. Geneva: World Health Organization.
7. Gadappa N, Sharma D, Gavit Y. Comparative study of various oxytocics in management of third stage of labour. Int J Reprod Contracept Obstet Gynecol 2018;7:4035-41
8. Borovac-Pinheiro A, Pacagnella RC, Cecatti JG, Miller S, El Ayadi AM, Souza JP, et al. Postpartum hemorrhage: new insights for definition and diagnosis. American Journal of Obstetrics and Gynecology 2018;219(2):162-8
9. Kramer MS, Berg C, Abenhaim H, et al. Incidence, risk factors, and temporal trends in severe postpartum hemorrhage. Am J Obstet Gynecol. 2013;209:449. e1-e7.
10. Rao SB, Fonseca M, Ajmera S, Dhanajayan B, Badhwar VR. Is oral Misoprostol a promising alternative to standard oxytocic in the third stage of labor.
11. Sultana N, Khatun M. Misoprostol versus oxytocin in the active management of third stage of labor. J Bangladesh Coll Phys Surg. 2007;25:73-6.
12. Parson SM, Walley RL, Crane JMG, Mathews K, Hutchens D. Rectal Misoprostol versus oxytocin in the management of the third stage of labor. J Obstet Gynaecol Can. 2009;29(9);711-8.
13. Sharma M, Kaur P, Kaur K, Kaur A, Kaur PK, Kaur MM. A comparative study of oxytocin/ misoprostol/ methylergometrine for active management of the third stage of labor. J Obstet Gynecol India. 2014;64(3):175-9.
14. Alam A, Shyam P, Goswami S. A comparative study of efficacy of oxytocin, methylergometrine and misoprostol in prevention of post-partum haemorrhage. Int J Reprod Contracept Obstet Gynecol. 2017;6(5):1960-4.
15. Sharmila K. A Comparative Study of Active Management of the Third Stage of Labor IV Methergine and IM Oxytocin. Journal of Pharmaceutical Research International. 2021 Sep 30;33(45A):267-72.