

## Comparative study of blood loss in C-section with usage of intravenous oxytocin and intramuscular methergine-in a tertiary care hospital

Dr Shameem nihar<sup>1\*</sup>, Dr Sukanya mukherjee<sup>2</sup>, Dr Banumathy, Dr Revwathy<sup>4</sup>, Dr Sankareswari<sup>5</sup>

<sup>1</sup>(Post Graduate student -Department of OG-Trichy SRM Medical college hospital&Research centre, Tiruchirapalli, India)

<sup>2</sup>(Associate Professor- <sup>3</sup> Department of OG-Trichy SRM Medical college hospital&Research centre, Tiruchirapalli, India)

<sup>3</sup>(Assistant Professor- Department of OG-Trichy SRM Medical college hospital &Research centre, Tiruchirapalli, India)

<sup>4</sup>(Professor of OG & Dean- Department of OG-Trichy SRM Medical college hospital&Research centre, Tiruchirapalli, India)

<sup>5</sup>(Professor &HOD-- Department of OG-Trichy SRM Medical college hospital&Research centre, Tiruchirapalli, India)

\*Corresponding Author: Dr Shameem Nihar

### ABSTRACT:

**BACK GROUND** :Post partum haemorrhage is a life threatening condition contributing to majority of maternal mortality-commonest cause is uterine atonicity(12 %)-signifying the active management and the use of prophylactic uterotonics<sup>1</sup>. **AIM**: To compare the efficacy of intra-venous Oxytocin and intra muscular methergine in control of Postpartum Haemorrhage. **OBJECTIVE** :To substantiate the use of Oxytocin as the first line uterotonic. **METHODS** :100 AN Mothers taken for LSCS during the study period (from 01.12.2020 to 07.06.2021) in Trichy SRMMCH&RC -were included in the study. **Inclusion criteria** : Those with- Duration of surgery  $\leq$  2 hours, patients giving written consent, BMI  $\leq$  30. **Exclusion criteria**: Duration of surgery  $>$  2hours, patients with PROM, patients not giving consent, known sensitivity to oxytocin and methergine. previous H/O bleeding disorders. BMI  $>$  30., Previous H/O post partum haemorrhage, H/O antepartum haemorrhage. Patients were divided into two groups each containing 50, based on random sampling. Group A was given 10 units intravenous Oxytocin and Group B was given 0.2 mg intramuscular methergine after delivery of placenta and outcomes were studied on the basis of blood loss and fall of Haemoglobin and PCV. **RESULTS** : After statistical analysis with SPSS Version 16-No significant differences was noted among the 2 groups, except for significant fall of PCV in oxytocin group than methergine group. **CONCLUSION** : Both drugs are equally efficacious in controlling postpartum haemorrhage as prophylactic uterotonics. Considering the significant side effects of methergine with quickest onset of action –oxytocin is equally effective with better safety profile.

**KEY WORDS** :Postpartum haemorrhage, Atonic PPH, Uterotonics.

### INTRODUCTION:

Obstetric haemorrhage is a major cause of maternal mortality with an incidence of 7 per 1000 deliveries among the critically ill post partum patients 35 % cause is due to postpartum haemorrhage<sup>1</sup>

The golden period of management in Post partum haemorrhage is often missed because the bleeding may be concealed and may get diluted with the mixing of amniotic fluid making accurate measurement difficult and delayed. The physiological changes in pregnancy like increased cardiac output and increased blood volume at term, mask the quantity and magnitude of blood loss. The earliest sign of acute blood loss-Tachycardia presents only after 30 % - 40 % of circulating volume is lost which leads to delayed recognition and treatment. The uteroplacental blood flow is 800-900 ml at term ,amounting to brisk and rapid haemorrhage difficult to control.Among the causes like trauma to the genital tract,retained products of conception,abnormally adherent placenta ,bleeding disorders,placental anomalies,acute uterine inversion –Atonicity contributes to 25 %- 50%.<sup>2</sup>

The regular and swift implementation of the Active management in third stage of labour has lead to substantial reduction of post partum haemorrhage to 60 %.

The three indissociable actions in this are (1)Administration of prophylactic uterotonic (2)Cord clamping and cutting (3)controlled cord traction.<sup>5</sup>

This necessitates the need for Active management of third stage of labour with prophylactic uterotonics,early cord clamping and controlled cord traction Oxytocin stimulates contractility of uterine muscles acting through sodium channel in 2 minutes after intravenous injection and effect persists for 30-60 minutes without any significant side effects. Intramuscular Methergine is an ergot alkaloid acting directly on serotonin receptors of smooth muscles of uterine blood vessels causing immediate vasoconstriction preventing blood loss within 2 minutes of administration with significant side effects.

Methergine is a conventional uterotonic used extensively ,considered it as a second line drug because of its vexatious side effects like vomiting ,hypertension ,hour glass constriction of uterus and retained products and the worst one-cardio respiratory arrest.This study aims to add up to the significance and substantiation to the use of Intravenous oxytocin as the first line drug in the management of PPH.

#### **METHODS :**

This was a prospective interventional comparative study conducted in the Department of Obstetrics and Gynaecology at Trichy SRM Medical college hospital and research centre ,Irungalur,Trichy between 01.12.2020 to 07.06.2021.The sample size taken was 100 with 50 in Group-A and 50 in Group B .

#### **Inclusion criteria:**

- 1)All singleton pregnancy with Gestational age > 37 weeks.
- 2) AN patients with intact membranes
- 3) All patients taken for LSCS-including elective and emergencies
- 4) Duration of surgery </= 2 hours .
- 5) BMI </= 30 and
- 6)Those giving willingness and consent for the study.

#### **Exclusion criteria :**

- 1)Multifetal gestation,
- 2)Duration of surgery > 2 hours
- 3)Previous H/O antepartum haemorrhage ,Postpartumhaemorrhage ,bleeding disorders
- 4)BMI>30

- 5)patients with known sensitivity to oxytocin and methergine
- 6)patients not giving consent
- 7)Patients with absolute contraindications to methergine like –heart disease, Rh negative pregnancy hypertensive disorder ,pre-eclampsia and those with peripheral vascular diseases.

The 100 AN patients taken for LSCS during the study period in the Institute is divided into 2 groups –A and B according to the random sampling .The following variables were taken into consideration 1)volume of blood loss in ml .2)fall or difference in Haemoglobin and Packed cell volume. 3)Duration of 3<sup>rd</sup> stage of labour 4) need for 2<sup>nd</sup> line drugs to control PPH 5)need for blood transfusion .After delivery of the baby ,time was given for spontaneous placental separation and the time was measured.For Group-A patients ,intravenous 10 U Oxytocin was given and the blood loss in ml was measured through separate suctioning .For Group-B patients intramuscular 0.2 mg methergine was given and the same process of blood loss measurement was done.

This study was discussed in the Institutional ethics committee and Institutional Research board in Trichy SRM Medical college and research centre and was approved .

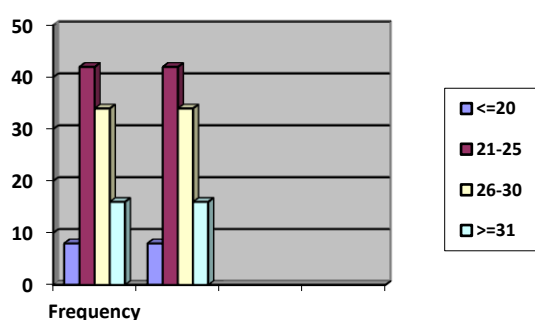
## RESULTS :

**TABLE-1: Age wise distribution**

AGE	FREQUENCY	PERCENTAGE
<20 yrs	8	8.0
21-25	42	42.0
26-30	34	34.0
31 and above	16	16.0

Age distribution was from 18 – 32 years . Out of the 100 subjects 45 (50%) were in the age group of 18-25 years. 34 % were between 26-30 years, and 16% were above 31 years

**Table 1 Age wise distribution**



**TABLE-2 : Age distribution in Oxytocin Group**

AGE range	Frequency	Percent
<=20	5	10.0
21-25	17	34.0
26-30	18	36.0
>=31	10	20.0

**TABLE-3: Methergine Group-Agewise Distribution**

	Frequency	Percent
<=20	3	6.0
21-25	25	50.0
26-30	16	32.0
>=31	6	12.0
Valid		

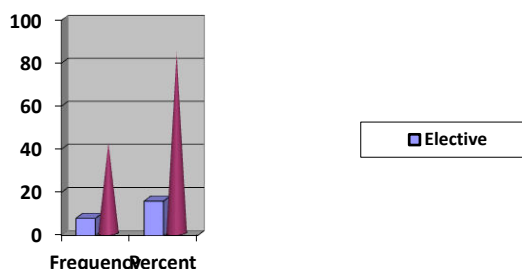
**TABLE-4 Gravidia distribution in Oxytocin group**

	Frequency	Percent
Primi gravida	14	28.0
Multi gravida	36	72.0
Total	50	100.0

**TABLE-5 Gravidia distribution in Methergine Group**

	Frequency	Percent
Primigravida	13	26.0
Multigravida	37	74.0
Total	50	100.0

In both the groups ,majority were Multigravida

**Figure 2 Type of surgery in oxytocin Group****Table-6 Surgery type-Distribution in Oxytocin group**

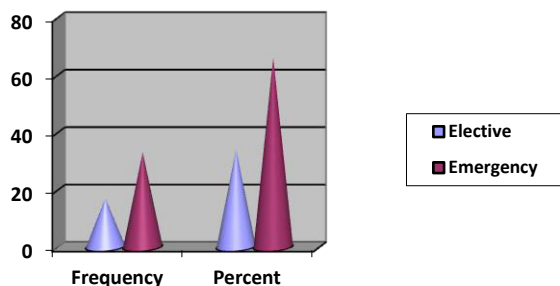
	Frequency	Percent
Elective	17	34.0
Emergency	33	66.0
Total	50	100.0

**Table-7 Surgery Type in methergine group**

	Frequency	Percent
Elective	8	16.0
Emergency	42	84.0

Total	50	100.0
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**Table 2-Surgery type in Methergine group**



In Group A 66%(33)were emergency c sections and 34%(17) were elective.

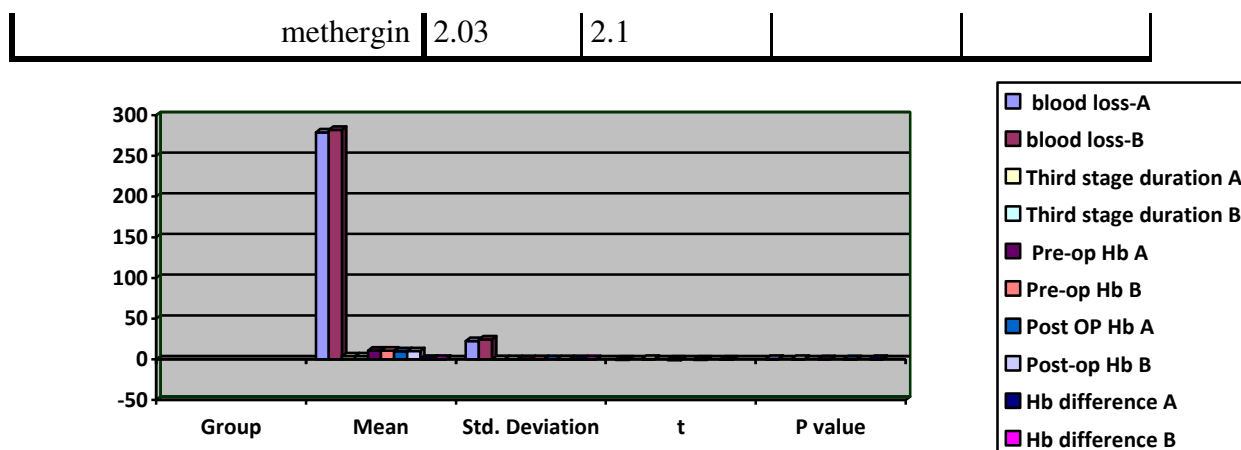
In Group-B 84% (42)were Emergencies and 16%(8)were planned.

**TABLE- 8 DESCRIPTIVE STATISTICS**

	Minimum	Maximum	Mean	Std. Deviation
Third stage duration	3.0	5.2	4.0	0.4
Blood loss	240	320	280.4	23.6
Pre OP Hb	10.0	11.6	10.77	0.4
Post OP Hb	9.5	11.0	10.13	0.3
Pre OP HCT	28	33.2	29.7	1.3
Post Op HCT	26	30.0	27.6	1.3

**TABLE-9: Comparison of different variables in both groups**

	Group	Mean	Std. Deviation	T	P value
Blood loss	Oxytocin	278.8	22.6	-.67	0.5
	methergin	282.0	24.6		
Third stage duration	Oxytocin	4.0	.45	.59	0.5
	methergin	3.9	.48		
Pre OP Hb	Oxytocin	10.7	.42	-.97	0.3
	methergin	10.8	.43		
Post OP Hb	Oxytocin	10.1	.29	-.71	0.4
	methergin	10.1	.35		
Hb difference	Oxytocin	.62	.42	-.41	0.6
	methergin	.66	.48		
Pre OP HCT	Oxytocin	30.0	1.4	2.3	0.02
	methergin	29.4	1.2		
Post Op HCT	Oxytocin	27.9	1.1	2.1	0.03
	methergin	27.42	1.3		
HCT difference	Oxytocin	2.12	1.4	.23	0.8



**Figure 2-Comparison of variables**

The Mean duration of third stage of labour among the group A was  $4.034 \pm 0.455$  minutes and the mean duration in the B group is  $3.978 \pm 0.488$  minutes. Comparison between the blood losses in the third stage of labour between the two groups is shown (Table 9). The mean Pre-operative Hb% in the A group was  $10.73 \pm 0.423$  and the mean Hb% in the B group was  $10.82 \pm 0.437$ . The mean Hb% 24hrs after delivery in the Oxytocin (A) group is  $10.108 \pm 0.2919$  % and in the oxytocin group is  $10.82 \pm 0.437$  gms% (Table 9).

The mean PCV in the A group was  $30.0806 \pm 1.4773$  and the mean PCV in the group B was  $29.456 \pm 1.2455$  % The mean PCV 24hrs after delivery in the group A was  $27.964 \pm 1.1783$  and the mean PCV 24 hrs after delivery in the B group was  $27.42 \pm 1.3716$  (Table 9).

Out of 100 cases in the study- 4 (4%) women needed additional oxytocic in the form of Intravenous 20 u Oxytocin . The remaining 96 (96%) did not need any additional oxytocics .

### Independent Samples Test

		t-test for Equality of Means		
		Degrees of freedom	P value	Mean Difference
Third stage duration in minutes	A group	96	0.4	.06
	B group	95.9	0.4	.06
Hb difference	A group	96	0.6	0.03
	B group	89.042	0.6	0.03
PCV difference	A group	96	0.6	0.14
	B group	84.231	0.6	0.14

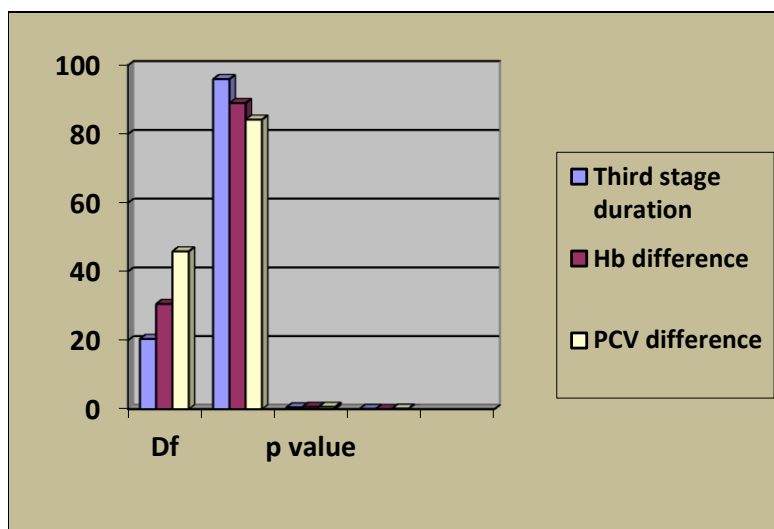


Figure 3-comparison between Group A and B-t Test for equality of means.

### DISCUSSION:

The World Health Organization (WHO) statistics suggest that worldwide, 25% of maternal deaths are due to PPH, accounting for more than 100,000 maternal deaths per year. The death of these mothers has serious implications for the newborn and any other members of the family.<sup>10</sup> The best choice of uterotonic will be the one which can be used in all levels of maternity care, which must be affordable at a low cost, should be without stringent storage conditions, easily accessible and with easy and simple administration technique.

Both oxytocin and methergine almost fits for all the above reason-with an additional advantage of oxytocin over methergine is its wide range of safety profile in place of methergine –which has certain absolute and relative contra-indications. In our study both were equally effective in controlling blood loss and fall of Haemoglobin from the pre-operative value. In Group-B, the fall in Haematocrit is lesser than Group-A, indicating the increased potency of methergine over Oxytocin, which was proved by statistical significance. In both the groups, there was no post-natal anaemia and need for blood transfusion.

In a study conducted by Adhikari S et al there was no statistical significance between the mean fall in both groups.<sup>4</sup> In the present study, the mean fall in Hb in the Oxytocin group was  $0.628 \pm 0.428\%$  and in the Methergine group it was  $0.66 \pm 0.428\%$ . The p value is 0.678, statistically insignificant.

In the study by Adhikari S, et al there was no statistical significance between the mean fall in PCV between the methergine group and the oxytocin group.<sup>4</sup> In the present study the mean fall in PCV in the two groups was  $2.122 \pm 1.406$  in the Oxytocin group and  $2.036 \pm 2.187$  in the methergine group with a p value of 0.234 which is statistically insignificant.

In the study conducted by Adhikari S, et al the incidence of use of additional oxytocics was almost the same though statistically insignificant. The incidence of PPH was higher in oxytocin group compared to methylergometrine group but this did not reach statistical significance.<sup>4</sup>

In the present study only 4 (8%) women of the oxytocin group required the use of additional oxytocics and none of the women of either groups required exploration of the uterus or blood

transfusion. In the study by Adhikari S, et al the adverse effects of oxytocin were mild and they subsided spontaneously. Also the mean fall of PCV was statistically not significant, in the present study<sup>4</sup>

In our study 12 patients (24%) in Group-B had vomiting and 6 (12%) patients had increased blood pressure, while Group-A patients who were given Oxytocin alone did not have any side effects. The intravenous route is technically easy to administer during C-section and can be used in patients with contra-indications for methergine. Also, the additional advantage of Oxytocin, is whenever there is a need for additional uterotonic, dose escalation can be done without significant side effects.

**Limitations:** The main limitation is small sample size and external validity. Large sample studies, considering the various Antenatal risk factors like –anaemia complicating pregnancy, multiple pregnancy, pre-eclampsia, H/O previous surgeries on uterus, Fibroid complicating pregnancy –are imperative to advocate the same in future

**SUMMARY :** It is seen that intravenous oxytocin is as effective as intra-muscular methergine in lessening the blood loss after placental separation and thereby alleviating the incidence of post-partum haemorrhage. The plasma half life is 1-6 minutes and the clinical response is rapid after intravenous infusion almost as close as to the onset of action of methergine<sup>11</sup>.

**CONCLUSION :**

- Oxytocin remains the first line uterotonic for the management of Post Partum Haemorrhage.
- This study has unveiled that both the uterotonics- Oxytocin and methergine were impartially worthwhile in the prevention and management of post-partum haemorrhage.
- The cost of Oxytocin is also relatively low and easily available.
- It can also be used in emergencies –like imminent delivery, when patient is received in 2<sup>nd</sup> stage without the knowledge of patient's previous history, whereas the other commonly used uterotonics (T.misoprostol, Inj. Carboprost, Inj. Tranaexamic acid) needs to be used with caution.

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