



# A Prospective Study To Compare The Efficacy Of Uterotonic Drugs In Prevention Of Primary Postpartum Haemorrhage In A Tertiary Care Center.

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## ABSTRACT:

**Background:** Postpartum haemorrhage (PPH) is an important cause of maternal morbidity and mortality, especially in the developing countries. Various uterotonic drugs are being used for active management of third stage of labour and thereby for prevention of postpartum haemorrhage.

**Objective:** The Objective of this study is to compare the effectiveness of various uterotonic drugs which can be used in the active management of third stage of labour and thereby for prevention of PPH.

**Material and Methods:** This prospective study was conducted in the department of obstetrics and gynaecology of Government Medical College, Doda, over a period of 1 year w.e.f. of 2019 to 2020. Patients were divided into four groups-I, II, III, IV of 100 women each. Pregnant women in Group-I were given oxytocin 10IU intramuscular after delivery of baby, Group-II received 125µg Intramuscular carboprost, Group-III received 800µg misoprostol per rectally and Group-IV received 0.2 mg intravenous methylergometrine. Duration of third stage of labour, amount of blood loss, drop in haemoglobin and side effect of drugs was recorded and compared in each group.

**Results:** Amount of blood loss was maximum with methylergometrine (mean-457 ml) and minimum with carboprost (mean 151 ml). Duration of third stage of labour was minimum with carboprost (mean 3.86min) whereas maximum with methylergometrine (6.06min). Fall in haemoglobin was also seen more with methylergometrine (mean drop of 0.912 ml) and whereas minimum with carboprost (mean drop of 0.256ml).

**Conclusion:** Carboprost is the uterotonic of choice followed by oxytocin for the active management of third stage of labour and thereby in the prevention of primary PPH based on this prospective study.

**Keyword:** Active management of third stage of labour, postpartum haemorrhage, uterotonic drugs.

Postpartum haemorrhage is one of the dreaded complications of third stage of labour and an important cause of maternal mortality accounting for nearly 20-30% of maternal deaths[1]. Postpartum haemorrhage (PPH) is commonly defined as a blood loss of 500ml or more after vaginal delivery or blood loss in excess of 1000ml after caesarean delivery[2]. For clinical purposes however, any blood loss enough to cause hemodynamic instability is also termed postpartum haemorrhage[3]. PPH that occurs in first 24 hours after delivery is called primary PPH whereas one that occurs between 24 hours and 6 weeks after delivery is called secondary PPH.

Active management of third stage of labour is considered the "gold standard" strategy for reducing the incidence of primary PPH. Active management of third stage of labour combines non-drug interventions (controlled cord traction and cord clamping) along with the administration of different uterotonic drugs at the time of delivery of anterior shoulder[4]. Oxytocin, methylergometrine, misoprostol (Prostaglandin E1 analogue) and carboprost (Prostaglandin F2 alpha) are the drugs conventionally used for prophylaxis against primary PPH [5]. Routine active management of third stage of labour for reducing likelihood of PPH plays an important role in reducing maternal mortality and morbidity in modern obstetrics. Recent studies have shown that there are still wide variations in practice around the world in the management of third stage labour [6].

Although there are several uterotonic agents for preventing PPH but there is still uncertainty about which agent is most effective with least side effects.

The purpose of the present study was to evaluate and compare the efficacy of four different uterotonic drugs that can be used in the active management of third stage of labour and thereby in prevention of PPH.

## II. MATERIALS AND METHODS:

This prospective study was conducted in the Department of obstetrics & gynaecology of Govt.

## I. INTRODUCTION:-



Medical College, Doda, J&K over a period of one year w.e.f 2019 to 2020.

#### Study Population:

Women with singleton, term pregnancy without any risk factors were included in the study whereas Women with preterm or post term gestation, fetal complications like intrauterine growth retardation, intra-uterine fetal death and maternal complications like multiple pregnancy, grand multiparity, APH, malpresentations, PIH, history of medical disorders like cardiac diseases or anemia etc, known allergy to prostaglandins were excluded from the study.

Informed consent and counselling of the patients was done. After detailed history including name, age, parity, socioeconomic status, gestational age, obstetrical history and clinical examination, patients were randomized into four groups of 100 each. Active management of third stage of labour was done within one minute after delivery of the baby using one of the four uterotonic drugs as per the group of patients. Group-I patients received 10 IU intramuscular oxytocin. Group-II patients received 125 µg intramuscular carboprost, Group-III patients received 800 µg misoprostol per rectally and group-IV patients received 0.2 mg intravenous methylergometrine.

Placenta was delivered by controlled cord traction as soon as signs of placental separation appeared. A new preweighed delivery towel was placed beneath the perineum of patient before the delivery of placenta and preplacental fluid volume was subtracted from the postplacental fluid volume so as to accurately calculate the actual amount of blood loss at the time of delivery. Afterwards the patient was monitored in the labour room for 2 hrs and then shifted to maternity ward. All the soaked drapes and pads were weighed and old weight was subtracted from the new weight. A 100 gm increase

in weight was considered to be equivalent to 100ml of blood loss (specific gravity of blood is equal to 1gm/ml).

Initial measurement was done after delivery of the placenta. Later on, patients had measurement of the delivery towel/pad after 2 hours, before being transferred to the maternity ward, where monitoring was continued for 24 hours. Each pad removed by the patient within first 24 hours of delivery while still in the maternity ward were also weighed and the difference in weight calculated. Duration of third stage of labour was noted. Predelivery and post delivery blood samples (24 hours after delivery) were taken to determine the haemoglobin. Side effects if any of the uterotonics were also noted.

Data was collected prospectively using a proforma. The collected data was evaluated for duration of third stage of labour in all groups, amount of blood loss during third stage of labour, drops in mean haemoglobin levels in various groups & side effects of various uterotonics.

**Statistical Method:** The statistical analysis was done using paired t-test and student t-test for continuous variables. Data was calculated as means, standard deviation (SD), numbers and frequency (%). p-value of <0.05 was considered statistically significant.

### III. RESULTS:-

#### 1. Baseline Characteristics:-

The baseline characteristics of all participants in the four groups were comparable. Mean age of patients in group-I was 25.96 yrs, G-II was 25.16 yrs, G-III was 24.16 yrs and G-IV was 25.84 yrs. All groups were also comparable with regards to parity, booking status, BMI, gestational age and number of episiotomies given [Table-I]

Parameter	Group-I (Oxytocin)N=100	Group-II (Carbopost)N=100	Group-III (Misoprostol) N=100	Group-IV (Methylergometrine) N=100
1. Age in years (mean)	25.96	25.16	24.16	25.84
2. Booked (%)	56	45	57	52
3. Unbooked (%)	44	55	43	48
4. Nullipara (%)	73	61	55	76
5. Multipara (%)	7	9	45	12
6. Gestation in weeks (Mean)	39.4	38.6	39.6	38.4
7. Episiotomy(% given)	78	72	86	66



8. Episiotomy (%) not given	22	28	14	34
9. BMI (%) <19.50	6	9	5	4
19.50-24.99	82	78	80	76
25-29.99	8	2	6	12
30-34.99	4	11	9	8

**2.Primary and secondary outcome measures indicative of Blood loss[Table-2]**

- a. The mean duration of third stage of labour: The mean duration of third stage of labour was 5.74 minutes in group-I, 3.86 minutes in Group-II and 6.06 minutes in Group-IV. Mean duration of third stage was lowest in group-II i.e. 3.86 minutes and this is statistically significant with p-value of 0.003.
- b. Mean Blood loss: Considering the amount of blood loss in various groups, mean blood loss in group-I, II, III, IV was 243.3, 151, 275.6, 457 ml respectively. Maximum blood loss was seen in group IV (methylegometrine) and

minimal in group-II (carboprost) with a p-value of <0.001 which is statistically significant.

- c. Drop in Haemoglobin: Participants in Group-I, II, & III showed comparable drop in haemoglobin 0.474, 0.256 & 0.46gm. However, maximal drop in haemoglobin was observed in group IV participants upto 0.912 gm which is statistically significant with p-value of 0.002.
- d. PPH & blood transfusion. Out of 100 patients 8 patients in group IV had PPH which is statistically significant with a p-value of 0.0006. Out of eight patients who had PPH three required additional oxytocics and blood transfusion.

Parameter	Group-I (Oxytocin)	Group-II (carboprost)	Group-III (Misoprostol)	Group-IV (Methylegometrine)	P-value
Mean Duration of third stage of labour (minutes)	5.74	3.86	5.95	6.06	0.003
Mean Blood loss (ml)	243.3	151	275.6	457	<0.0002
Mean Drop in Hemoglobin (%)	0.474	0.256	0.46	0.912	<0.0001
Number of patients having PPH (Blood loss > 500ml)	0	0	0	8	0.0006
Number of patients requiring additional oxytocics & blood transfusion	0	0	0	3	0.111

**Medication Side effects:**

Nausea and vomiting were found to be commonest side effects in all groups followed by shivering.

Fever, was more common in group III & diarrhea in group-II whereas hypertension was seen in group IV [Table 3]

**Table – 3. Medication Side effects..**

	Group-I	Group-II	Group-III	Group-IV	p-value
Nausea Vomiting	4	8	5	3	
Fever	0	2	15	0	
Shivering	5	3	9	4	
Diarrhea	0	7	1	0	
Hypertension	0	1	0	5	



#### IV. DISCUSSION:

In developing countries like India Postpartum haemorrhage is regarded as one of the major causes of maternal morbidity and mortality[8]. The primary aim in the management of postpartum haemorrhage should be its prevention. The active management of third stage of labour with routine prophylactic administration of uterotonic drugs at the time of delivery of anterior shoulder of fetus has been shown to reduce the risk of postpartum haemorrhage by about 40% [9].

Methylergometrine is a conventional oxytocic used extensively but is associated with side effect like hypertension. Intramuscular oxytocin used alone has been effective in preventing PPH and is recommended by WHO but most of the time it requires additional uterotonics[6,10]. The discovery of prostaglandins and its analogues as an oxytocic has improved prospect in modern era in control of PPH with few side effect[11].

The present study has also shown that Prostaglandin F<sub>2</sub>Alfa i.e. carboprost is the uterotonic of choice followed by oxytocin for active management of third stage of labour. From present study mean duration of the third stage of labour in carboprost group was 3.86 min and this is comparable to studies conducted by Anajneyu et al.[12] and Bhattacharya et al.[4]. Various studies conducted by Reddy et al. and B Rajuparashotam [13] have shown that the mean blood loss with carboprost 125 µg was less compared to methylergometrine & results are comparable to present study where mean blood in third stage in carboprost group was 151ml and methylergometrine was 457 ml (p-value of 0.0002) which was highly significant. None of the patients developed PPH in carboprost group whereas 8 patients had PPH in methylergometrine group. Patients required additional uterotonics and blood transfusion in methylergometrine group and none in other 3 groups. Drop in Hemoglobin was also statistically significant in methylergometrine group thereby corroborating the results of mean blood loss to be true. The recorded higher incidence of shivering and pyrexia in misoprostol group is in keeping with previous studies on the use of misoprostol for prevention and treatment of PPH[14,15]. In group-II Diarrhea and Vomiting were most commonly observed. This is comparable to the study of Chua et al. (1995) where they found significant increase in incidence of diarrhea with carboprost[16]. In group-IV in addition to shivering, nausea and vomiting, hypertension was

also observed. This is consistent with the study of Gohil j et al. (2011)[1]

#### V. CONCLUSION.

PPH prevention interventions need to be prioritized as an essential way to improve maternal health. There is no panacea that can be universally implemented yet increasing access to prophylactic uterotonics regardless of where deliveries occur should be the primary means of reducing the burden of this complication.

Present study emphasises that carboprost, a potent uterotonic is better alternative to other uterotonics in active management of third stage of labour and thereby in prevention of primary PPH. However sample size of present study may limit its generalizability thereby signalling the need for larger studies to further investigate this important subject towards reducing maternal morbidity and mortality from PPH especially in developing countries.

#### Conflict of interest

The authors have no conflict of interest to disclose.

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