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**ORIGINAL RESEARCH**

# A Comparative Observational Study of Oxytocin Bolus and Oxytocin Infusion During Caesarean Section

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**ABSTRACT**

**Background:To assess the statistically significant effects in the oxytocin bolus and infusion to decrease caesarean section postpartum haemorrhage.Postpartum haemorrhage (PPH) during Caesarean section is one of the most common causes of maternal death throughout the world > 72% in India. Although the value of routine oxytocics to reduce postpartum haemorrhage after vaginal birth has been well established, their value in caesarean section has received little attention. The present Prospective observational cross-sectional study is an attempt to compare the efficacy of intravenous oxytocin bolus dose followed by infusion and only intravenous oxytocin infusion following delivery of fetus in elective and emergency LSCS with regard to their influence on various parameters to prevention of postpartum haemorrhage**

**Materials and Methods: Present study was done at Department of Obestetrics & Gynecology,Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India and analysed the efficacy of intravenous oxytocin bolus followed by infusion and only intravenous oxytocin infusion on uterine tone, alterations in mean arterial pressure (MAP), alterations in heart rate (HR), blood loss by difference in hemoglobin and hematocrit, need for additional oxytocin and side effects of the drugs, if any in 350 low risk patients scheduled to undergo elective and emergency lower segment caesarean section under spinal anesthesia during the a period of September 2020 to April 2022.**

**Results: The average decline in hemoglobin was prevalent in group B with 4.51+/-0.1gm%. than in group A 3.69+/-1.28gm%. There was a homologous simultaneous decrease in PCV by16.42 +/- 3.1 in group B than in group A 13.25+/-1.46, which was statistically significant. There were fall in Hemoglobin and PCV in both the groups. There were improvements in uterine tone by 25th minute in both groups as compared to 5th minute. All patients in Group A and B had adequate to well contracted uterus.**

**Conclusion: It is concluded from this study that oxytocin intravenous bolus can be given in cases where atonic PPH is expected like, multifetal gestation, polyhydromnios, big baby, prolonged labour, obstructed labour.**

**Keywords: PPH, LABOUR, Oxytocin, multifetal gestation, polyhydromnios.**

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## INTRODUCTION

Caesarean section is one of the most commonly performed major operations in women throughout the world. These operations have escalated over the past four decades to between 20% and 30% in most developed countries, up to 40% in China, as high as 70% in some Latin American countries. Postpartum hemorrhage (PPH) during Caesarean section is one of the most common causes of maternal death throughout the world > 72% in India. Pregnancy and childbirth involves significant health risks, even to women with no preexisting health problem. Worldwide there are an estimated 500,000-600,000 deaths of mothers in childbirth annually of which 25% are due to severe bleeding. World Health Organization (WHO) also estimated 20 million annual maternal morbidities due to hemorrhage.[1] In developing countries, where maternal mortality rates are exponentially higher, PPH plays an even greater role. Although the value of routine oxytocics to reduce postpartum haemorrhage after vaginal birth has been well established, their value in caesarean section has received little attention.[2] It has been assumed that the benefits of oxytocics observed at vaginal birth also apply to caesarean section where maternal mortality is high and resources are limited, the introduction of low cost evidence based practices to prevent and manage postpartum hemorrhage can improve maternal and infant survival.[3,4]

The WHO technicalworkinggroup(1990)definedPostpartumhaemorrhage as bleeding from genital tract in excessof 500ml in the first 24 hours after delivery.[5] The incidence of PPH is estimated to be 10% of all deliveries, 2-4% after vaginal delivery and 6% after caesarian section with uterine atony being the cause in 50% ofcases.[6]

Uterine atony, which complicates 1 in 20 deliveries, results in excessive blood loss when adequate myometrial contraction fails to occur after placental expulsion. As such the normal physiological mechanism of uterine contraction and retraction of uterus is disturbed in LSCS due to incision onuterus. In cases of elective LSCS, since labour has not started, the endogenous oxytocin is absent and sensitivity of uterus to oxytocin exogenously administered is less. Risk factors for uterine atony include conditions where the uterus is overdistended (polyhydramnios, multiple gestation, fetal macrosomia, fatigued, rapid or prolonged labour, chorioamnionitis), or simply inability to contract (use of uterine relaxing agents like tocolytics or general anesthesia).[3]

Active management of third stage of labour, including early cord clamping and controlled cord traction and administration of oxytocic drugs such as ergometrine and oxytocin have been beneficial.[7] Prophylactic routine use of oxytocics has been shown to reduce incidence of PPH by up to 40%.[8] The best management of the third stage would be onethateffectively minimizes serious problems such as blood loss and retained placenta, while interfering as little as possible with the physiological mechanisms of placental delivery and bonding between mother and baby, and has few side effects.

Recent studies show that there are still wide variations in practice around the world in the management of third stage of labour. Methyl ergometrine is a conventional oxytocic used extensively but is associated with unpleasant side effects like hypertension. Intravenous oxytocin used alone has been found effective in preventing Postpartum hemorrhage and results in fewer side effects.[9] Due to the short half-life, oxytocin is normally administered as an infusion, ideally in a fluid medium which is isotonic with plasma (Ringer Lactate, Normal Saline) so that the risk of water toxicity is minimized. Doses used range from 5 to 10 units per hour, with 250 to 500 ml fluid as vehicle, per hour. Poor and delayed increases in uterine tones led to trials of bolus doses (over 5 to 10 seconds) to overcome these problems and at the same time, to avoid deleterious hemodynamic disturbances.[10-13]

The present study is an attempt to compare intravenous oxytocin bolus dose followed by infusion and only intravenous oxytocin infusion after elective and emergency LSCS (equivalent to management of third stage of labour, but here following LSCS) for prevention of postpartum hemorrhage.

**Objectives**

To compare the efficacy of intravenous oxytocin bolus(2 IU) dose followed by infusion (160 mIU/min) and only intravenous oxytocin infusion (160 mIU/min) following delivery of fetus in elective and emergency LSCS with regard to their influence on –

- Uterine tone
- Alterations in mean arterial pressure(MAP)
- Alterations in heart rate(HR)
- Blood loss by difference in hemoglobin and hematocrit
- Need for additional oxytocin
- Side effects of the drugs, if any.

## MATERIALS & METHODS

The study was conducted in 350 low risk patients scheduled to undergo elective and emergency lower segmentcaesarean section under spinal anesthesia, in the Department of Obstetrics and Gynecology, Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India.

The aim was to compare the efficacyofintravenous oxytocin bolus dose followed by infusion and only intravenous oxytocin infusion after fetal extraction in elective and emergency LSCS (equivalent to management of third stage of labour, buthere in LSCS).

**Inclusion criteria**

- After informed & written consent
- Patients scheduled to undergo elective and emergency lower segment caesarean section.

**Exclusion criteria:**

- Complicated cases with increased risk of atony or excessive bleeding like known placenta previa, multiplegestation, more than 2 previous LSCS, grandmulti and h/o repeated abortions.
- Cardiovascular instability like pre-eclampsia, essential hypertension.
- Systemicillnessessuchassevereanaemia,bleeding diathesis and significantcardiovascular disease.
- Prolonged labour with failed induction.
- Fetal distress.
- Contraindications to spinal anesthesia
- Patient refusal.

Three hundred and fifty obstetric cases admitted to labor ward with term gestation (37 completed weeks to 42 weeks) and scheduled to undergo elective and emergency lower segment caesarean section, were divided into 2 groups group A and group B each group with 175 cases and sampling done by randomsampling technique (chit method).

**Group A:** Patients were given 2 IU (2ml) of Intravenous oxytocin bolus followed byoxytocin infusion 160 mIU/min following delivery of fetus in LSCS.

**Group B:** Patients were given 2 ml placebo bolus of normal saline and intravenous oxytocin infusion 160 mIU/min following delivery of fetus in LSCS.

An informed & written consent was taken from the patients who met the inclusion criteria. These women underwent a thorough general and systemic examination including cardiovascular system, respiratory system, per abdomen and per vaginal examinations.
Patients were given 2 IU (2ml) of Intravenous bolus of test drug/placebo followed byoxytocin infusion 160 mIU/min following delivery of fetus in LSCS.
Primary parameters studied were the uterine tone and the effects on hemodynamics.

1. Intra operatively grades of uterine tone was assessed at $2^{nd}$, $5^{th}$, $10^{th}$, $20^{th}$, $30^{th}$, $45^{th}$, $60^{th}$min after oxytocin administration. Uterine tone was assessed by 5 point scale by palpation & rugosities on uterus
   1 = Atonic
   2 = Inadequately
   3 = contracted
   4= Adequately contracted 5 = Well contracted
2. Alterations in mean arterial pressure(MAP) & heart rate(HR) were noted at 3, 6, 9, 15, 20, 25, 30, 40, 50, 60 minutes.
3. Packed cell volume(PCV) / Hematocrit and Hemoglobin (Hb in gm%) values were obtained at the time of admission to the labour room and repeated 24 hours after the last oxytocin infusion by Wintrobes method and Sahlis hemoglobinometer respectively.
4. Need for augmenting uterine tone by increasing the rate of oxytocin infusion by 25%, further by 50% increase in infusion rate, methyl ergometrine, carboprost if any, noted.
5. Adverse effects, if any, including nausea, vomiting, headache, diarrhea /bronchospasm / flushing are noted.

## RESULTS

This study was conducted in 350 low risk pregnant women posted for emergency and elective Lower segment caesarean section(LSCS). Both A and B groups were similar with regard to antepartum variables i.e, maternal age, gravidity, parity and gestational age.

**Table 1: Age wise distribution of study subjects**

| Age group | Groups | | | | Total no | Total % |
|---|---|---|---|---|---|---|
| | Group A | Percentage % | Group B | Percentage % | | |
| 19 – 23 yr | 52 | 29.71% | 49 | 28% | 101 | 28.36% |
| 24 – 28 yr | 100 | 57.16% | 96 | 54.85% | 196 | 56.5% |
| 29 –33 yr | 19 | 10.85% | 18 | 10.28% | 37 | 10.57% |
| > /= 33 yr | 04 | 2.28% | 12 | 6.87% | 16 | 4.57% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

chi square – 1.86df-2 p value – <0.001 (significant)

The age distribution is shown in table 1. Majority of patients were between 24 – 28 years of age in both the groups. Mean age of patients in group A was 25.12 +/- 1.2 years & in group B was 24.76 +/- 2.2 years. There was no difference in the age distribution between 2 groups statistically.

**Table 2: Distribution of study subjects based on Gravidity status**

| Gravida | Groups | | | | Total no | Total % |
|---|---|---|---|---|---|---|
| | Group A | Percentage % | Group B | Percentage % | | |
| Gravida I | 69 | 39.42% | 42 | 24.02% | 149 | 42.57% |
| Gravida II | 91 | 52.01% | 80 | 45.71% | 133 | 38.01% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Gravida Multi | 15 | 8.57% | 53 | 30.26% | 68 | 19.42% |
| Total | 175 | 100 % | 175 | 100% | 350 | 100% |

chi square – 0.06df-2 p value –< 0.001 (significant)

In group A majority 52.01% (91) were under gravida I followed by 39.42% (69) and 8.57%(15)were under the gravidity group of Gravida II and Gravida multi respectively were as prime part of patients 45.71% (80) in group B was Gravida II succeeded by 30.26% (53) Gravida multi and 24.02% (42) were under Gravida I. There was clear unequal distribution with difference in gravid score in both the groups was observed.

**Table 3: Distribution of study subjects based on indications of LSC**

| **Indications** | **Groups** | | | | **Total no** | **Total %** |
|---|---|---|---|---|---|---|
| | **Group A** | **Percentage %** | **Group B** | **Percentage %** | | |
| Presentation | | | | | | |
| Breech | 12 | 6.85% | 12 | 6.85% | 24 | 6.85% |
| Brow | 01 | 0.57% | 01 | 0.57% | 2 | 0.571% |
| Face | 02 | 1.14% | 01 | 0.57% | 3 | 0.857% |
| Compound | 01 | 0.57% | 01 | 0.57% | 2 | 0.571% |
| Liquor | | | | | | |
| Anhydromnios | 01 | 0.57% | 03 | 1.71% | 4 | 1.14% |
| Oligohydromnias | 18 | 10.28% | 20 | 11.42% | 38 | 10.85% |
| Prolapse | | | | | | |
| Cord | 00 | 0% | 00 | 0% | 0 | 0% |
| Hand | 00 | 0% | 01 | 0.57% | 1 | 0.285% |
| Lie | | | | | | |
| Transverse | 02 | 1.14% | 01 | 0.57% | 3 | 0.857% |
| Oblique | 03 | 1.71% | 02 | 1.14% | 5 | 1.42% |
| CPD | 41 | 23.42% | 46 | 26.28% | 87 | 24.85% |
| Contracted pelvis | 15 | 8.57% | 16 | 9.14% | 31 | 8.85% |
| IUGR | 02 | 1.14% | 01 | 0.57% | 3 | 0.857% |
| PROM | 21 | 12% | 19 | 10.85% | 40 | 11.42% |
| Previous LSCS | 56 | 32% | 51 | 29.14% | 107 | 30.57% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Most common indication for LSCS in both the groups was previous LSCS 32% followed by CPD 23.42%, PROM 12%, oligohydromnias 10.28%, contracted pelvis 8.57% and breech 6.85% respectively in group A and in group B also the prevalent is previous LSCS 29.14% followed by CPD 26.28%, oligohydromnias 11.42%, PROM 10.85% and breech 6.85% discretely. PROM is more prevalent in group A than group B whereas oligohydromnias was little bit more in group B as compared to group A. the hand, brow, compound, transverse and IUGR indications were the least causes of LSCS in both groups.

The contracted pelvis 9.14% and breech 6.85% respectively, next common indication was CPD, 15 % in both the groups. Brow presentation. compound presentation and hand prolapse were least common indications.

**Table 4: Elective & Emergency LSCS Distribution**

| LSCS | | Groups | | | Total no | Total percentage% |
|---|---|---|---|---|---|---|
| | Group A | Percentage% | Group B | Percentage % | | |
| Elective | 51 | 29.14% | 45 | 25.71% | 96 | 27.42% |
| Emergency | 124 | 70.85% | 130 | 74.28% | 254 | 72.57% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

chi square – 0.04 df-2 p value – <0.001 (significant)

Out of 350 subjects 254 (72.57%) has undergone emergency LSCS of which group B was dominant with 51.18% over group A 48.81%. Analogously the elective LSCS were predominant in group A 29.14% than in group B 25.71%.

**Table 5: Comparison of Hb and PCV before and after LSCS in Group A&B**

| | Parameters | Before LSCS (mean +/- sd) | After LSCS (mean +/- sd) | Average decline | P value* |
|---|---|---|---|---|---|
| Group A | Hb (gm/dl) | 13.26 +/- 1.5 | 8.72 +/- 0.5 | 3.69+/-1.28 | <0.001 (significant) |
| | PCV (%) | 40.06 +/- 4.2 | 24.51 +/- 1.2 | 13.25+/-1.46 | <0.001 (significant) |
| Group B | Hb (gm/dl) | 14.26 +/- 1.2 | 6.72 +/- 0.2 | 4.51+/-0.1 | <0.001 (significant) |
| | PCV (%) | 41.06 +/- 3.1 | 23.51 +/- 1.2 | 16.42 +/- 3.1 | <0.001 (significant) |

* Paired 't' test

The average decline in hemoglobin was prevalent in group B with 4.51+/-0.1gm%. than in group A 3.69+/-1.28gm%. There was a homologous simultaneous decrease in PCV by 16.42+/- 3.1 in group B than in group A 13.25+/-1.46, which was statisticallysignificant. There were fall in Hemoglobin and PCV in both the groups. Estimated blood loss in group A was 528 ml & in group B was 869 ml.

**Table 6: Change of MBP at different intervals of time in Group A and Group B**

| Time of interval | MBP (mmHg) | |
|---|---|---|
| | Group A (mean +/-sd) | Group B (mean +/-sd) |
| Basal | 81.95 +/- 9.01 | 83.35 +/- 8.0 |
| 0 min | 81.25 +/- 8.2 | 81.69 +/- 9.12 |
| 3 min | 80.23 +/- 9.6 | 79.81 +/- 11.1 |
| 9 min | 79.61 +/- 9.8 | 78.56 +/- 9.9 |
| 15 min | 75.10 +/- 11.4 | 77.04 +/- 10.5 |
| 20 min | 74.98 +/- 10.5 | 75.59 +/- 6.5 |
| 25 min | 73.49 +/- 12.1 | 74.21 +/- 10.1 |
| 30 min | 80.29 +/- 14.7 | 77.39 +/- 1.25 |
| 40 min | 81.28 +/- 11.1 | 79.46 +/- 9.8 |

| | | |
|---|---|---|
| 50 min | 82.38 +/- 6.4 | 80.56 +/- 8.6 |
| 60 min | 82.69 +/- 12.05 | 81.11 +/- 9.5 |

*Independent 't' test

By 25 minutes, the mean arterial pressure decreased by 8 mmHg in group A, compared with 9 mmHg in group B. This difference of fall in MBP at 20th minute is not significant between the two groups. After 25 minutes MBP was recovered back.

**Table 7: Comparison of heart rate at different intervals of time between Group A and Group B**

| **Time of interval** | **Heart rate** | |
|---|---|---|
| | **Group A (mean +/-sd)** | **Group B (mean +/-sd)** |
| Basal | 87.38 +/- 51.1 | 83.89 +/- 26.8 |
| 0 min | 87.99 +/- 82.3 | 85.51 +/- 58.1 |
| 3 min | 88.40 +/- 25.0 | 89.97 +/- 69.8 |
| 9 min | 89.65 +/-32.8 | 91.81 +/- 73.8 |
| 15 min | 90.72 +/- 19.4 | 92.18 +/- 22.1 |
| 20 min | 91.69 +/- 17.3 | 94.0 +/- 11.8 |
| 25 min | 92.99 +/- 29.0 | 96.65 +/- 18.3 |
| 30 min | 91.62 +/- 8.2 | 99.64 +/- 29.5 |
| 40 min | 90.64 +/- 9.8 | 97.47 +/- 31.0 |
| 50 min | 90.47 +/- 25.4 | 96.96 +/- 29.9 |
| 60 min | 90.39 +/- 36.0 | 94.6 +/- 12.1 |

* Independent 't' test

The heart rate increased by 5 beat at 25 minutes in group A, & by 7 beats by 20minutes in group B.

**Table 8: Comparison of uterine tone at 5 min between Group A and Group B**

| **Uterine tone** | **Group A** | **Percentage%** | **Group B** | **Percentage%** | **Total no** | **Total %** |
|---|---|---|---|---|---|---|
| Atonic | 10 | 5.71% | 10 | 5.71% | 20 | 5.71 |
| Inadequate contracted | 43 | 24.57% | 54 | 30.85% | 97 | 27.71 |
| Adequately contracted | 110 | 62.85% | 96 | 54.85% | 206 | 58.85 |
| Well contracted | 12 | 6.85% | 15 | 8.57% | 27 | 7.71 |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Chi square – 28.38 df-3p value – 0.05 (significant)

At 5 minutes, in group A, in 62.85% of cases, uterus was adequately contracted, followed by 24.57 % with inadequately contracted uterus. In 6.858% of cases uterus waswell contracted. About 5.71% had atonic uterus.

In group B, 54.85 % of cases had adequately contracted uterus, followed by 30.85% inadequately contracted and 8.57% had well contracted. In 5.71% uterus was atonic. The difference between this uterine tonicity at 5 minutes between 2 groups asstatistically significant.

**Table 9: Comparison of uterine tone at 10 min between Group A and Group B**

| Uterine tone | Group A | Percentage% | Group B | Percentage% | Total no | Total % |
|---|---|---|---|---|---|---|
| Atonic | 1 | 0.57% | 2 | 1.14% | 3 | 0.85% |
| Inadequate contracted | 12 | 6.85% | 19 | 10.85% | 31 | 8.85% |
| Adequately contracted | 20 | 11.42% | 36 | 20.57% | 56 | 16.02% |
| Well contracted | 142 | 81.16% | 118 | 67.44% | 260 | 74.28% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Chi square – 49.10 df-3 p value – 0.01 (significant)

By 10 minutes, in group A, uterus was well contracted in 81.16% of cases, adequately contracted in 11.42%. In 6.85% cases uterus was inadequately contracted and only 0.57% had atonic uterus. That is in 90.28% of patients uterus was adequate to well contracted. In group B, in 67.44% of cases, uterus was well contracted, followed by 20.57% adequately contracted. In 10.85% uterus was inadequately contracted. Only 1.14% had atonic uterus. The difference between this uterine tonicity at 10 minutes between 2 groups was statistically significant.

**Table 10: Comparison of uterine tone at 15 min between Group A and Group B**

| Uterine tone | Group A | Percentage% | Group B | Percentage% | Total no | Total % |
|---|---|---|---|---|---|---|
| Atonic | 0 | 0% | 0 | 0% | 0 | 0% |
| Inadequate contracted | 1 | 0.57% | 2 | 1.14% | 3 | 0.85% |
| Adequately contracted | 15 | 8.57% | 20 | 11.42% | 35 | 10.02% |
| Well contracted | 159 | 90.85% | 154 | 88.04% | 313 | 89.42% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Chi square – 29.68 df-4 p value – 0.001 (significant)

At 15 minutes, in group A, in 90.85% of cases, uterus was well contracted, followed by 8.57% adequately contracted and only 0.57% were inadequately contracted None had atonic uterus. At 15 minutes, in group B, in 88.04% of cases, uterus was well contracted, followed by 11.42 % adequately contracted. In 1.14% uterus was inadequately contracted. None had atonic uterus.

**Table 11: Comparison of uterine tone at 25 min between Group A and Group B**

| Uterine tone | Group A | Percentage% | Group B | Percentage% | Total no | Total % |
|---|---|---|---|---|---|---|
| Atonic | 0 | 0% | 0 | 0% | 0 | 0% |
| Inadequate contracted | 0 | 0% | 0 | 0% | 0 | 0% |
| Adequately contracted | 0 | 0% | 0 | 0% | 0 | 0% |

| | | | | | | |
|---|---|---|---|---|---|---|
| Well contracted | 175 | 100% | 175 | 100% | 350 | 100% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Chi square – 5.12 df-2 p value – <0.001 (highly significant)

There were improvements in uterine tone by 25th minute in both groups as compared to 5th minute. All patients in Group A and B had adequate to well contracted uterus

**Table 12: Need for additional uterotonics**

| **Extra uterotonics** | **Group A** | **Percentage%** | **Group B** | **Percentage%** | **Total no** | **Total %** |
|---|---|---|---|---|---|---|
| No increase in infusion rate | 173 | 98.85% | 168 | 96% | 341 | 97.42% |
| 25% increase in infusion rate | 2 | 1.14% | 7 | 4% | 9 | 2.57% |
| 50% increase in infusion rate | 0% | 0% | 0 | 0% | 0 | 0% |
| Methyl ergometrin | 0% | 0% | 0 | 0% | 0 | 0% |
| Carboprost | 0% | 0% | 0 | 0% | 0 | 0% |
| Total | 175 | 100% | 175 | 100% | 350 | 100% |

Chi square – 29.08 df-4 p value < 0.001 (highly significant)

In group A, in 98.85% of patients shown good uterine tone and there was no need of any other extra uterotonic, only 1.14% needed augmentation oftone by increase in rate of infusion by 25%. In Group B 96% achieved well uterine contractions and 4% needed augmentation of tone by increase in oxytocin infusion rate by 25%. There was no need for Methyl ergometrine and Carboprost in both groups.

## DISCUSSION

This randomized controlled study was conducted in Department of OBG, Dr. PSIMS &RF, Vijayawada, Andhra Pradesh, India. To comparethe effects of oxytocin bolus (followed by infusion) and oxytocin infusion during caesarean section after matching demographic variables. A total of 350 patients who fulfilled the selection criteria were randomly assigned to 2 groups. In our study we compare the blood loss between two groups by drop in haemoglobin and drop in PCV. Oxytocin causes acquisition of good uterine tone, hence less blood loss. Estimated blood loss could be in group A was 528 ml & in group B was 869 ml.

In group B, there was decrease in haemoglobin concentration by 3.69+/-1.28gm% and 4.51+/-0.1gm% in group B from baseline values. There was decrease in PCV of 16.42 +/- 3.1 in group B and is 13.25+/-1.46 in group A.

| Authors | Year | Sample no | P value | Conclusion |
|---|---|---|---|---|
| Gregory et al,[8] | 2005 | 201 | 0.002 | Bolus oxytocin of 10 IU is not associated with adverse hemodynamic responses and can safely be administered to women with intravenous access in the third stage of labour forpostpartum haemorrhage prophylaxis. |
| Miki Fujimoto et al,[10] | 2006 | 438 | <0.001 | Intravenousinjectionof5IUoxytocinimmediately after delivery of fetal anteriorshoulder is the treatment of choice for prevention of PPH |
| Thomas et al,[7] | 2007 | 30 | <0.001 | We recommend that bolus doses should be used with caution, and further studies should ascertain if oxytocin is equally effective in reducing blood loss when given at a slowerrate. |
| Sharon R Sheehan,[11] | 2011 | 2069 | <0.001 | The addition of an oxytocin infusion after caesarean delivery reduces the need foradditional uterotonic agents and reduced overall haemorrhage |
| Present study | 2022 | 350 | <0.001 | oxytocin iv bolus can be given to attain good uterine tone earlier. So oxytocin intravenous bolus can be given in cases whereatonic PPH is expected like, multifetal gestation, polyhydromnios, big baby, prolonged labour,obstructed labour. |

In study conducted by Thomas et al9, where 30 women were allocated to receive 5u oxytocin bolus or as infusion over 5 minute, where there was no differences in estimated blood loss between bolus and infusion groups. In a study conducted by Gregory et al,[10] 99 women received an intravenous oxytocin bolus (10 IU push) and 102 women received an infusion (10 IU in 500 mL saline at 125 mL/h) at delivery of the anterior shoulder. Estimated blood loss was calculated from drop in hemoglobin similar to our study. The dilute oxytocin infusion group experienced a greater mean estimated blood loss (423.7 mL comparedwith mL, P+/- .029, t test), and a greater drop in hemoglobin (admission minus postpartum) (17.4g/L compared with 11.4g/L,P +/- .002, t test) compared with theoxytocin bolus group. In study conducted by Thomas et al,[9] the mean arterial pressure decreased by 27 (7.6) mmHg in the bolus group compared with 8 (8.7) mm Hg in the infusion group. In study conducted by Gregory et al,[10] serial mean arterial pressure measures varied significantly between groups (interaction effect, P +/- .002). Mean arterial pressure (+/- standard deviation) nadirs were reached after 10 minutes, 80.9 (+/- 11.0) mmHg in the bolus group compared with 77.0 (+/- 12.1) mm Hg in the dilute infusion group. The mean difference (95% confidence interval) between groups was 4.0 (0.7– 7.2) mm Hg. Serial heart rate measures also varied between groups (interaction effect,P < .001).

In study conducted by Gregory et al10 Mean heart rate (+/- standard deviation) peaked 1 minute after the oxytocin infusion, 115 (+/-27) beats per minute (bpm) in the bolus group compared with 109 (+/- 21) bpm in the dilute infusion group. The mean difference (95% confidence interval) between groups was 6.6 bpm (+/-0.1 to 13.3).

In a study conducted by Gregory et al,[10] the dilute oxytocin infusion group experienced increased use of additional oxytocin (35.3% compared with 22.2%, P+/- .044, Fisher exact test) compared with the oxytocin bolus group.

## CONCLUSION

It is concluded from this study that oxytocin bolus with infusion causes earlier attainment of better uterine tone when compared with only infusion. There was no significant blood loss between 2 groups in the form of difference in hemoglobin and difference in PCV. Hemodynamically patient was stable in both the study groups. There was need for extra uterotonics in group B. no adverse effects were noted in both groups. Hence, Oxytocin bolus can be given to attain good uterine tone earlier. So oxytocin intravenous bolus can be given in cases where atonic PPH is expected like, multifetal gestation, polyhydromnios, big baby, prolonged labour, obstructed labour.

## REFERENCES

1. Dildy GA. Postpartum hemorrhage new management option. Clin Obstet Gynecol 2002;45(2):330-344.
2. World Health Organization. The prevention and management of post partum haemorrhage. Report of a technical working group. WHO: Geneva; 3-6 July, 1989, WHO / MCH / 90.7, world health organization; 1990.
3. Elbourne DR, Prendiville WJ, Carroli G, Wood J, McDonald S. Prophylactic use of oxytocin in the third stage of labour. Cochrane Database Syst Re2001;4:CD001808.
4. Lokugamage AU, Paine M, Bassaw Balroop K, Sullivan KR, Refaey HE, Rodeck CH. Active management of the third stage at caesarean section: a randomised controlled trial of misoprostol versus syntocinon. Aust N Z J Obstet Gynaecol2001;41:411-4.
5. Amy JJ. Severe postpartum haemorrhage: A rational approach. Natl Med J India 1998;11:86-8.
6. WHO 2001. Global estimates of maternal mortality for 1995: Results of an indepth review analysis and estimation strategy. Geneva: WHO; 2001.
7. Prendiville W, Elbourne D, Chalmers I. The effects of routine oxytocic administration in the management of the third stage of labour: an overview of the evidence from controlled trials Br J Obstet Gynaecol 1988;95:3-16.
8. Dutta DC. Textbook of Obstetrics. 6th edn. Calcutta, New Central Book Agency Pvt. Ltd ; 2004. p. 114-144.
9. Thomas JS, Koh SH, Cooper GM. Haemodynamic effects of oxytocin given as i.v. bolus or infusion on women undergoing caesarean section. BrJAnaesth2007; 98: 116–9.
10. Gregory A. L. Davie, Julie L. Tessie, Mary C.Woodman, Maternal Hemodynamics After Oxytocin Bolus Compared With Infusion in the Third Stage of Labor: A Randomized Controlled Trial Obstet Gynecol 2005;105:294–9.
11. Ghosh A, Ng A, Duthie SJ Ho PC. Intra-operative blood loss during elective lower segment caesarean section. Br J Obstet Gynaecol. 1992 May;99(5):364-7. cta Obstet Gynecol Scand. 2006;85(11):1310-4.
12. Miki Fujimoto , Kyousuke Takeuchi, Makoto Sugimoto, Takeshi Maruo, Prevention of postpartum hemorrhage by uterotonic agents: comparison of oxytocin and methylergometrine in the management of the third stage of labor: 2006;85(11):1310-4.
13. Sharon R Sheehan , Alan A Montgomery, Michael Carey, Fionnuala M McAuliffe, Maeve Eogan, Ronan Gleeson, Michael Geary, Deirdre J Murphy, ECSSIT Study Group; Oxytocin bolus versus oxytocin bolus and infusion for control of blood loss at elective

caesarean section: double blind, placebo controlled, randomised trial; 2011 Aug 1;343:d4661. doi: 10.1136/bmj.d4661