Research Article

Intravenous methergin versus intramuscular oxytocin in active management of third stage labour

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Abstract

Abstract: Post partum haemorrhage is the single most significant cause of maternal death worldwide. More than half of all maternal deaths occur within 24 hours of delivery, most commonly from excessive bleeding. It is estimated that worldwide 1,40,000 women die of postpartum haemorrhage each year—one every 4 minutes[1]. **Objectives:** To assess and compare the efficacy of intramuscular oxytocin 10 IU and intravenous methergin 0.2 mg during active management of third stage of labour. **Methods:** 210 women delivering either vaginally or by caesarean were included and randomised into two groups. In Group I 100 women were given injection oxytocin 10 IU IM and in group II 110 women were given injection methergin 0.2 mg IV within one minute of delivery of the baby prophylactically. The main outcome measures were amount of blood loss, duration of third stage, need for MRP, incidence of PPH, need for repeated oxytocics and its side effects**. Results:** The mean blood loss at vaginal delivery in Group I was 354 ml and in group II was 162.72 ml with P value 0.00046, which was statistically significant .The mean blood loss at caesarean delivery in Group I was 741.66 ml and Group II was 492.7 ml with P value 0.036, which was statistically significant. The mean duration of third stage of labour in Group 1 was 7.35 min and Group 2 was 6.21 min**. Conclusion:** In the active management of third stage labour intravenous methergin is a better uterotonic when compared to intramuscular oxytocin to reduce the amount of blood loss at delivery and prevent complications like atonic PPH.

Keywords: Postpartum haemorrhage, third stage labour, uterotonics.

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INTRODUCTION

Uterine atony is the most common cause of obstetrical haemorrhage and most common cause of maternal death worldwide. The incidence of post partum haemorrhage is 10.5[1]. According to WHO 25.7% of maternal deaths are contributed by India. High prevalence of anaemia and multiparity add to this morbidity in developing countries like India. Post partum haemorrhage is traditionally defined as excessive blood loss that results in haemodynamic instability. Blood loss of more than or equal to 500ml after vaginal delivery and more than or equal to 1000ml after a caesarean delivery is termed as PPH. Postpartum haemorrhage generally is classified as primary or secondary, with primary haemorrhage occurring within the first 24 hours of delivery and secondary haemorrhage occurring between 24 hours and 6–12 weeks postpartum. Primary postpartum haemorrhage, which occurs in 4–6% of pregnancies, is caused by uterine atony in 80% or more of cases[2] Risk factors for uterine atony include overdistended uterus like polyhydramnios, multiple gestation, macrosomia, others like precipitate labour, prolonged labour, multiparity, functional or anatomical distortion of uterus. Active management of third stage of labour is highly effective in preventing PPH in more than half of the cases potentially saving thousands of women's lives, especially in a rural set up. Routine use of active management of third stage of labour for all vaginal singleton births in health facilities is

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recommended by the International Federation of Gynecologists and Obstetricians (FIGO) and the International Confederation of Midwives (ICM),[3] as well as by WHO.[4]

The definition of active management of the third stage of labour varies and includes use of a uterotonic drug immediately following delivery of the fetus, controlled cord traction and early cord clamping and cutting.[5] The FIGO–ICM definition includes use of a uterotonic immediately following delivery of the fetus, controlled cord traction and fundal massage immediately after delivery of the placenta, followed by palpation of the uterus every 15 minutes for 2 hours to assess the continued need for massage.[3] Cord clamping is excluded based on research indicating that delayed clamping benefits preterm (and probably term) infants by preventing anemia.[6] There has been little research into the effects of the individual components of active management of the third stage of labour.

WHO recommendations for prevention of PPH include-AMTSL (2012)[7]

- A uterotonic, preferably oxytocin, 10 IU IM immediately after all births, including caesarean sections (recommended). If oxytocin is not available, ergometrine or misoprostol should be given.
- Delayed (1–3 minutes after birth) cord clamping (recommended)
- Controlled cord traction for delivery of the placenta (optional)
- Fundal massage (optional).
- Regular and frequent assessment of uterine tone by palpation of the uterine fundus after delivery of the placenta (recommended).

The objective of oxytocics is to ensure efficient contraction of the uterus immediately after the delivery of the baby, thereby minimising the blood loss due to failure of occlusion of capillaries at the placental site and also promote rapid separation of placenta. Many drugs like ergometrine, oxytocin, syntometrine, carbetocin and prostaglandins are used as uterotonic agents. An ideal uterotonic agent should promote prompt, strong and sustained uterine contractions without any significant adverse effects[8]. Methergin (methyl ergonovine maleate) is a semisythetic derivative of lysergic acid, acts directly on the smooth muscles of the uterus and increases the tone, rate and amplitude of rhythmic contractions. Thus it induces a rapid and sustained tetanic uterotonic effect which shortens the duration of third stage labour and reduces the blood loss. The onset of action following intravenous administration is almost immediate 96s, following IM injection 2-5 min and duration of action is 3 hours. Side effects include headache, nausea, vomiting, dizziness, hypertension, coronary artery spasm, intracerebral haemorrhage. Oxytocin, a synthetic hormone stimulates uterine smooth muscle contractions indirectly and helps expedite the normal contractions of spontaneous labour. As in all significant uterine contractions, there is a transient reduction in uterine blood flow and helps in preventing PPH. The onset of action following intravenous administration is almost immediate and following intramuscular injection is within 3-5 min and duration of action lasts for 20 min after the IV infusion is stopped and after IM injection lasts for 30-60 min. Side effects include hypotension or hypertension, tachycardia, dysrhythmias, angina pectoris, anxiety, seizure, nausea and vomiting, allergic reaction, uterine rupture (from excessive administration). In addition to death, serious morbidity may follow postpartum haemorrhage. Sequelae include adult respiratory distress syndrome, coagulopathy, shock, loss of fertility and pituitary necrosis (Sheehan syndrome). Although many risk factors have been associated with postpartum hemorrhage, it often occurs without warning. Therfore active management of third stage of labour would prevent PPH and ther by reduce the morbidity and mortality due to PPH. WHO recommends the use of intramuscular oxytocin immediately after birth in AMTSL to prevent PPH. Our study aims to compare the efficacy between intramuscular oxytocin and intravenous methergin to prevent the same.

MATERIALS AND METHODS

This study was conducted on 210 women admitted in the labour ward of Adichunchanagiri Hospital and Research centre, from 15th July 2014 till 15th October, 2014 by using two groups of simple randomized design. Institutional Ethical committee clearance was obtained. The eligible women admitted in the labour ward delivering at term by either vaginal or caesarean section were included. Group I included 100 women and received intramuscular oxytocin and Group II included 110 women and received intravenous methergin within one minute of delivery of baby. Inclusion criteria were women delivering at term without any obstetric or medical complications. Women with obstetric complications like pre eclampsia, gestational diabetes, abruption and women with medical disorders like hypertension, severe anaemia, coagulopathies and bleeding disorders were excluded from the study. Comparison was made between the two groups in terms of amount of blood loss, duration of third stage, need for MRP, incidence of PPH, need for repeated oxytocics and its side effects. On admission to labour room detailed history is taken and clinical examination is done. Patient vitals is noted, obstetric examination, fetomaternal monitoring is done and progress of labour is

monitored with partogram. Delivery is effected with the patient on the edge of the table. The patient receives intramuscular oxytocin 10 IU or intravenous methergin 0.2mg in a randomised order. Once delivered the bleeders are secured with artery forceps, and apex is secured. Placenta is delivered by controlled cord traction, duration of third stage is noted. Blood loss is measured using 18*18 inch dry sponges, and also by measuring the amount of blood collected in the container placed in the edge and beneath the delivery table. In caesarean delivery abdomen is opened through pfannenstiels incision, bleeders secured with artery forceps, intramuscular oxytocin 10 IU or intravenous methergin 0.2mg is given within one minute of delivery of the baby. Bleeders at the uterine angles are held with allis forceps and green amytage. Placenta delivered by controlled cord traction. Blood loss is assessed by the number of 18*18 inch sponge used and the amount of blood collected in the suction apparatus container. Outcome measures were amount of blood loss, duration of third stage, need for MRP, incidence of PPH, need for repeated oxytocics and side effects**.**

RESULTS

Table 1: Age distribution

	Mean age In Yrs
I M OXYTOCIN	23.3
I V METHERGIN	22.9

The mean age in the oxytocin group was 23.3 yrs and in the methergin group was 22.9 yrs.

PARITY

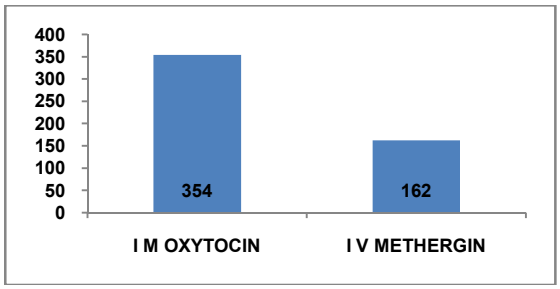
In group I 50% were primigravidas and 50% were multigravidas, in group II 43.63% were primigravidas and 56.36% were multigravidas.

	Primigravidas	Multigravidas	Total
I M OXYTOCIN	50 (50%)	50 (50%)	100
I V METHERGIN	48 (43.63%)	62 (56.36%)	110

BLOOD LOSS

- Vaginal delivery

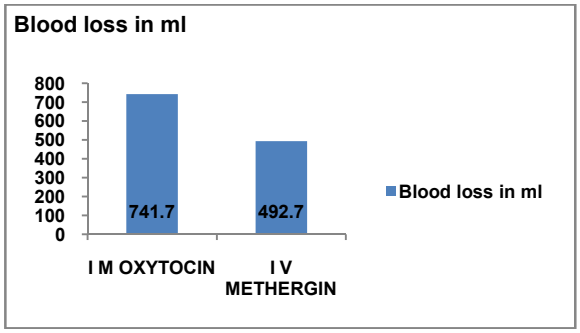
The mean blood loss at delivery in Group 1 was 354 ml and in group 2 was 162.72 ml with p value 0.00046



GROUP 1 GROUP 2

- Caesarean delivery

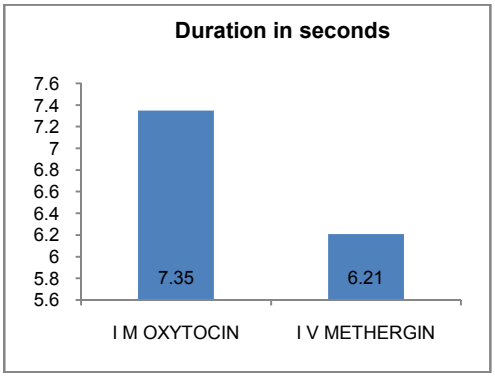
The mean blood loss at caesarean delivery in Group I was 741.66 ml and Group II was 492.7 ml with p value 0.036



GROUP 1 GROUP 2

DURATION OF THIRD STAGE OF LABOUR

The mean duration of third stage of labour in Group 1 was 7.35 min and Group 2 was 6.21 min with p value 0.318



GROUP 1 GROUP 2

DISCUSSION

Post Partum haemorrhage (PPH) is one of the most common causes of maternal deaths throughout the world. India has the largest number of maternal death 63,000[9]. According to WHO 25.7% of maternal deaths are contributed by India[10]. High prevalence of anaemia and multiparity add to this morbidity in developing countries like India especially in the rural population. Routine practice of active management of third stage of labour has

been shown to dramatically reduced haemorrhage by upto 60%. Also it reduces the need for more complex medical interventions to stop bleeding and reduces the need for blood transfusion. This is a particular benefit in setting where provisions of such maternal health services are inadequate[11]. In our study the mean age in group I was 23.28 years and group II was 22.83 years and in group I 50% were primigravidas and 50% were multigravidas, in group II 43.63% were primigravidas and 56.36% were multigravidas and both were not statistically significant, this is similar to the study conducted by Ajantha Boopathi *et al* where the average age in the oxytocin group was 25.92 years, while in the methergin group it was 26.19 years. There was no statistically significant difference between the two groups with regard to age and parity. In our study the average blood loss at vaginal delivery in group I was 354 ml and 162.7 ml in group II with p value of 0.00046, which was statistically significant, which is similar to study conducted by Ajantha *et al*[12] where the mean blood loss was 196.57 ± 192.30 (range 25 - 1200 ml) in Oxytocin group and 149.33 ± 145.47 (range 25 - 1300 ml) in the Methylergometrine group. The difference in mean blood loss between the two groups was 47.24 ml with p value of 0.003, which was statistically significant. The mean duration of third stage of labour in our study in Group I was 7.35 min and Group II was 6.21 min with p value 0.318, which was not statistically significant. In a study[13] conducted by Vandana *et al* the mean duration of third stage of labour in oxytocin group was 4.423±1.96 min and in methergine group was 3.791±1.584min (P value .24). In our study the mean blood loss was at vaginal delivery in group I was 354 ml and 162.7 ml in group II with p value of 0.00046 and at caesarean delivery in group I was was 741.66 ml and Group II was 492.7 ml with p value 0.036, both being statistically significant whereas in the study conducted by Vandana *et al* the mean blood loss in oxytocin group was 232.4± 73.52ml and in that of methergine group was 208.52±92.07 ml. No statistical significance was found in both the groups (P=0.32).

	Our study IM IV OXYTOCIN METHERGIN	Ajanta *et al*	Vandana Satwe *et al*
Average blood loss in ml	354 162.7	196.5 149.3	232.4 208.5
Duration of third stage in minutes	7.35 6.21	3.45 2.31(P <0.001)	4.42 3.79

In our study there were 11 cases of atonic PPH in group I (intramuscular oxytocin) that accounts to 11% and 2 cases of atonic PPH in group 2 (intravenous methergin) that accounts to 1.8% and they required additional oxytocics which is comparable to study conducted by Ajanta *et al* [12] where 9.9% in the ergometrine group and 6.1% in the oxytocin group needed additional oxytocics. The side effects in the methergin group were nausea, vomiting and mild increase in blood pressure. In our study, in the vaginal delivery group, the pre delivery hematocrit in oxytocin group was 35.2 and methergin group was 36.1 and the post delivery hematocrit in oxytocin group was 33.4 and methergin group was 35.9 and in those with caesarean delivery pre delivery hematocrit in oxytocin group was 36.6 and methergin group was 37.4 and the post delivery hematocrit in oxytocin group was 32.5 and methergin group was 36.9 both with P value <0.001 thereby statistically significant and comparable to the study Ajanta *et al* [12] where the pre delivery hematocrit was 32.43 ± 2.89 in the Methylergometrine group and 31.61 ± 2.89 in the Oxytocin group and the post delivery hematocrit in the Methylergometrine group was 31.09 ± 3.12 and 29.71 ± 2.54 in the oxytocin group with p value of <0.001. Measurement of hematocrit before and after delivery is a more objective method in assessing the amount of blood loss. Although the onset of action of oxytocin is faster the duration of action is less whereas methergin induces sustained tetanic uterine contractions even though the onset is slightly slower than that of oxytocin, therefore complications like PPH is less in group 2. This is especially important in a rural set up like ours because many women are already anaemic and preventing excessive blood loss at delivery is of utmost importance to prevent complications like severe anaemia and cardiac failure.

CONCLUSION

From our study we conclude that in the active management of third stage labour intravenous methergin within one minute of delivery of baby is a better uterotonic when compared to intramuscular oxytocin to reduce the amout of blood loss at delivery (p value <0.05) and prevent complications like atonic PPH. As methergin induces tetanic uterine contractions it helps reducing the total blood loss when compared to intramuscular oxytocin.

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