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Research Article

Oxytocin versus methyl ergometrine in the management of third stage of labor: a comparative study from a South Indian tertiary care hospital

Deepa Rajendran, Mamatha Shivanagappa*, Anjali Siddesh, Surakshith Gowda

Department of Obstetrics and Gynecology, JSS Medical College and Hospital JSS University, Mysore, Karnataka, India

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***Correspondence:**
Dr. Mamatha Shivanagappa,
E-mail: mamathamahesh106@gmail.com

ABSTRACT

Background: Methyl ergometrine is the conventionally used oxytocic. A few studies have shown that oxytocin is also effective in with fewer adverse effects. This study was carried out to compare the efficacy of oxytocin and methergine in the management of third stage of labor.
Methods: 100 pregnant women with gestational age more than 37 weeks were taken up. Excluded were those with polyhydramnios, fibroid complicating pregnancy, intrauterine hemorrhage, antepartum hemorrhage, previous history of postpartum hemorrhage and contraindications to methergine. The subjects were randomised into two groups one given 0.2mg Methylergometrine and the other 10 Units of Oxytocin. The efficacy and the safety of these two drugs were analyzed with respect to fall in Haemoglobin (Hb) and Haematocrit (Hct) level, need for additional uterotonic agents, need for uterine evacuation, need for blood transfusion and duration of third stage of labor.
Results: The mean duration of third stage of labor in the methergine group was 6.44 ± 2.426 min and in the oxytocin group 6.28±2.556 min. Mean blood loss was 224.80±50.759 ml and 237.0±69.583 ml. The mean fall in Hb was 0.82±0.29 % and 0.86±0.007%. The mean fall in PCV was 0.93± 0.65 and 0.91±0.64. 6 (6%) in the oxytocin group required additional methergine. 8 (16%) who received methergine had vomiting and 9 (19%) had risen in blood pressure, while those on oxytocin alone did not have any significant adverse effects. Methylergometrine and Oxytocin were equally efficacious in reducing blood loss and duration of third stage of labor.
Conclusions: Intramuscular oxytocin is equally effective but has a better safety profile compared to methyl ergometrine and hence is a more preferable prophylactic uterotonic management of the third stage of labor.

Keywords: Oxytocics, Postpartum hemorrhage, Atonic uterus, Pregnancy

INTRODUCTION

Postpartum hemorrhage (PPH) is the leading cause of maternal death globally.[1] According to World Health Organization estimates worldwide about 20 million maternal morbidities are due to haemorrhage and nearly 51,500 maternal deaths occur yearly because of post-partum hemorrhage.[2,3] India has dubious distinction of having the highest annual maternal deaths of around 60,000 amounting to 25% of all maternal deaths worldwide.[4] Even a small loss of blood can be of great significance in anaemic patients. Any attempt at reducing the incidence of PPH remains a challenge.[5]

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.[5] Methyl ergometrine is a conventional oxytocic used extensively but is associated with unpleasant side effects such as hypertension. Currently there has been increased preference for intravenous oxytocin used alone which has been found effective with fewer side effects.

There are only a few large studies in this regard from South India. Hence the present study was taken up.

METHODS

The was a prospective hospital based comparative study conducted in the department of Obstetrics and Gynaecology at JSS Medical College and Hospital, Mysore between December 2012 to June 2014. 100 patients were included. Inclusion criteria was singleton pregnancy and gestational age more than 37 weeks Exclusion criteria were multifetal gestation, polyhydramnios, fibroid complicating pregnancy, intrauterine fetal demise, antepartum hemorrhage, previous history of postpartum hemorrhage, all pregnant women in whom methergine was contraindicated such as those with hypertensive, cardiac and coagulation disorders.

The women were managed actively by 10 Units oxytocin intramuscularly and 0.2mg methergine intramuscularly immediately after the delivery of the baby. The cord was clamped and cut immediately after the delivery of the baby. Controlled cord traction of the umbilical cord was done.

The following observations were noted (i) Blood loss estimated by blood collecting bag, (ii) Maternal Hemoglobin (Hb%) and (iii) Packed cell volume (PCV) before delivery and 24 hrs after delivery, (iv) duration of third stage of labor, (v) need for additional oxytocics, (vi) need for manual removal of placenta or subsequent surgical evacuation of retained products, (vii) need for blood transfusion and (viii) adverse effects of the oxytocics used.

The study was presented before and was cleared by the Institutional Ethical Committee of JSS Medical College.

RESULTS

Table 1: Distribution according to maternal age, mode of delivery & oxytocic used.

Age	Frequency	Percentage
<20	24	24
21-25	45	45
26-30	29	29
31 and above	2	2
Mode of delivery		
FTND	70	70.0
LSCS	30	30.0
Total	100	100.0
Oxytocic used		
Methergine	50	50.0
Oxytocin	50	50.0
Total	100	100.0

The total number of cases studied was 100.Age ranged from 18 -32 years. Out of the 100 subjects 45 (45%) were in the age group of 20-24 years. Out of the 100 women, 70 deliveries were Full term normal delivery and 30 were Lower Segment Caesarean Sections. 50 women were given oxytocin and 50 women were given Methergine (Table 1).

The Mean duration of third stage of labour among the Methergine group was 6.44±2.426 minutes and the mean duration in the oxytocin group is 6.28±2.556 minutes. Comparison between the blood losses in the third stage of labour between the two groups is shown (Table 2). The mean Hb% in the methergine group was 10.712 ± 1.1940 and the mean Hb% in the oxytocin group was 11.004± 1.1533. The mean Hb% 24hrs after delivery in the methergine group is 9.8840±0.9630 % and in the oxytocin group is 10.1426±1.08675 % (Table 3).

Table 2: Comparison between the duration of labour & blood loss.

Variable	Group	Mean	Std. deviation	P
Duration of 3rd stage (mins)	Methergine	6.44	2.426	0.749
	Oxytocin	6.28	2.556	
Blood loss (ml)	Methergine	224.80	50.759	0.319
	Oxytocin	237.00	69.583	

Table 3: Mean Hemoglobin before & 24hrs after delivery.

Variable	Group	Mean	Std. deviation	P
Hb BD	Methergin	10.712	1.1940	0.217
	Oxytocin	11.004	1.1533	
HB 24hrs later	Methergin	9.8840	0.96306	0.211
	Oxytocin	10.1426	1.08675	

Table 4: Mean PCV before & 24hrs after delivery.

Variable	Group	Mean	Std. deviation	P
PCV BD	Methergin	30.306	2.2223	0.248
	Oxytocin	30.784	1.8785	
PCV 24 hrs later	Methergine	29.374	2.1144	0.209
	Oxytocin	29.872	1.8132	

The mean PCV in the methergine group was 30.306±2.2223 and the mean PCV in the oxytocin group was 30.784±1.8785. The mean PCV 24hrs after delivery in the methergine group was 29.374±2.1144 and the mean PCV 24hrs after delivery in the oxytocin group was 29.872 ± 1.8132 (Table 4).

Out of 100 cases in the study 6 (6%) women needed additional oxytocic in the form of IM methergine 0.2mg. The remaining 94 (94%) did not need any additional oxytocic.

Table 5: Mean duration of 3rd stage of labour (min).

Duration of 3rd stage	Group	Mean	Std. deviation	P
Vandana et al	Methergine	3.79	1.58	0.2455
	Oxytocin	4.42	1.96	
Present study	Methergine	6.44	2.426	0.749
	Oxytocin	6.28	2.556	

Table 6: Distribution of blood loss in the third stage (ml).

Blood loss	Group	Mean	Std. deviation	P
Vandana et al	Methergine	156.72	82.98	0.66
	Oxytocin	166.64	64.17	
Present study	Methergine	224.80	50.759	0.319
	Oxytocin	237.00	69.583	

DISCUSSION

Without proper management Post-Partum Hemorrhage can rapidly progress to cause life threatening blood loss. Because of this unpredictability it does often pose a challenge. Routine practice of active management of third stage of labour has been shown to dramatically reduced hemorrhage by upto 60%. This is a particular benefit in setting where provisions of such maternal health services are inadequate.[6]

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 the conventional oxytocic used extensively but is associated with unpleasant adverse effects such hypertension. Intramuscular oxytocin used alone has been found effective in preventing postpartum hemorrhage and results in fewer side effects and is recommended by World Health Organization.[7]

Misoprostol, a synthetic analogue of Prostaglandin E_1 has been extensively studied for the prevention of postpartum hemorrhage administered by oral or rectal route.[8] It has not been found to be as effective as conventional injectable uterotonics and is associated with side effects like shivering and fever. However the problem of lesser efficacy of Misoprostol compared with injectable uterotonics could be solved by alternative routes of administration such as sublingual or oral solution, which result in earlier peak plasma levels of the drug.[9]

In the present study the mean maternal age group was 23.5 years and the study population included women with age ranging from 18-32 years (Table 1). In the study by Vandana Satwe et al the mean maternal age group was 23.3 years. The study included the women with ages ranging from 18-32 years.[9] The majority of women were Multigravida.Primigravida - 48% Multigravida - 52%.

In the present study the mean duration of third stage of labour in the methergine group was 6.44 min±2.426 and in the oxytocin group is 6.28±2.556 min. The p value was 0.74 which is statistically not significant. In the study conducted by Vandana, et al the mean duration of third stage of labour in the methergine group was 3.79 min and in the oxytocin group were 4.42. The p value was 0.24 which was statistically insignificant (Table 5).[3] Therefore oxytocin and methergine is effective in reducing the duration of third stage when used intramuscularly. In our study there were no cases with prolonged third stage.

In the study conducted by Vandana et al the mean blood loss was 156.72±82.98 ml in the methergine group and 166.64 ±64.17 ml in the oxytocin group. The p value was 0.66 and statistically insignificant.[9] In the present study the mean blood loss in the third stage of labour was 224.80±50.759 ml in the methergine group and 237.0±69.583 ml in the oxytocin group. The p value was 0.3 which is statistically insignificant. The difference in the blood loss between the two studies in the methegine group is 68.08 ml and in the oxytocin group is 70.36 ml, therefore in our study the mean blood loss in third stage is significantly low (Table 6).

In a study conducted by Adhikari S et al there was no statistical significance between the mean fall in Hb between the methergine group and the oxytocin group.[4] In the present study, the mean fall in Hb in the methergine group was 0.82±0.29% and in the oxytocin group it was 0.86±0.07%. The p value is 0.21, statistically insignificant. Therefore the decrease in haemoglobin level is slightly less when oxytocin is used intramuscularly compared to when methergine is used.

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.[4] In the present study the mean fall in PCV in the two groups was 0.93±0.65 in the methergine group and 0.91±0.64 in the oxytocin group with a p value of 0.2 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.[4]

In the present study only 6 (12%) women of the oxytocin group required the use of additional oxytocics in the form of IM methergine 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 oxytocis were mild and they subsided spontaneously.

In our study 8 (16%) women who received methergine had vomiting and 9 (18%) had risen in blood pressure, while those who were given oxytocin alone did not have any significant side effect. The usage of oxytocin in active management of third stage of labour is beneficial in reducing the blood loss in third stage and thus helps in preventing postpartum haemorrhage. Oxytocin given at dose 10 units intramuscularly is technically easier to use and can be used in situations where intravenous access is unavailable. Oxytocin is very safe to use with least adverse effects and can be used even in high risk women. It can be used even in hypertensive women and in those with cardiovascular disease.

The limitation of our study is the small sample size and further studies with larger number of subjects are needed.

In Summary, it is seen that IM Injection oxytocin is as effective as IM Injection methergine in reducing the incidence of post-partum hemorrhage, strongly favouring its routine use as oxytocic for active management of third stage of labour avoiding the undesirable side effects of nausea vomiting and elevated blood pressure associated with methergine.

CONCLUSIONS

This study has shown that both methylergometrine and oxytocin were equally efficacious. However Oxytocin had other advantages in the form of ease of administration, significantly better safety profile and lesser contraindications for usage. It is concluded that intramuscular oxytocin is a more preferable prophylactic uterotonic in the active management of the third stage of labour.

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