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Active Management of Third Stage of Labour. A Comparative Study in High Risk Patients for Atonic Postpartum Haemorrhage

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Summary:

One hundred twenty patients with one or more high risk factors for atonic postpartum haemorrhage admitted to labour room who met the criteria for inclusion formed the study group. They were randomly allocated to 3 groups. Group A (40) received Intravenous methyl ergometrine 0.2 mg at anterior shoulder delivery. Group B (40) received 10 units intraumbilical oxytocin diluted in 10 ml of normal saline. Group C (40) 250 mg of carboprost intramuscularly at delivery of anterior shoulder. Their efficacy in the management of third stage of labour with regard to duration, amount of blood loss and complications were assessed. There was no statistical difference in the three groups in duration of labour (151-164 seconds). However the mean blood loss was minimum in carboprost group followed by methyl ergometrine and oxytocin. Diarrhoea was the most common side effect in carboprost group. An increase in BP 10 mm of Hg was noticed in patients receiving methyl ergometrine.

Introduction

Haemorrhage still remains an important cause of morbidity and mortality amongst Obstetric patients in India. Postpartum Haemorrhage accounts for around 25% of maternal deaths (Hayashi et al 1981, Chamberlain 1992). Uterine atony was the responsible factor in majority of the cases and finding ways to reduce these deaths is a major challenge. The primary aim in the management of Postpartum Haemorrhage should be its prevention. Hence any means of reducing the blood loss in the third stage without considerable side effects is always welcome. Uterine atony remains the most common cause of Postpartum Haemorrhage. A review of major bleeding in the Postpartum period pointed out uterine atony as the aetiology in 81% of cases (Anjaneyulu et al, 1988). Active management of III stage of labour is strongly recommended especially in women who are at risk for uterine atony. Routine administration of Oxytocics reduces the risk of Postpartum Haemorrhage by 40% (Prendiville et al, 1988). Number of oxytocics are available the choice of oxytocic preparation, its efficacy and mode of administration varies.

The present study was designed to evaluate and compare the efficacy of oxytocic drugs namely methyl ergometrine, oxytocin and 15 (S) 15-methyl prostaglandin F2 a (Carboprost) in the active management of third stage of labour in high risk patients for Postpartum Haemorrhage due to uterine atony.

Materials and Methods

Randomized prospective comparative study of 120 patients attending JIPMER Hospital for confinement during 18 months period (September 1995 to July 1997) formed the study group, who had atleast one high risk factor for atonic Postpartum haemorrhage with gestational age of more than 28 weeks with vertex presentation and who deliver vaginally.

Inclusion Criteria:

1) Parity more than 4.
2) Patients with antepartum haemorrhage.
3) Hydramnios.
4) Twins.
5) Prolonged second stage.
6) Prolonged oxytocin induction/augmentation for > 12 hours.
7) Big baby > 4 kg.
8) Prolonged labour for > 24 hours.
9) Operative instrumental vaginal deliveries.

Exclusion Criteria:

Heart disease, Renal disease, Bronchial asthma, Epilepsy, Rh negative pregnant women, Traumatic postpartum haemorrhage, severe anaemia < 6 gms%, Hepatic disease, Hypertension.

They were divided into 3 groups.

Group A – 40 patients. Received 0.2 mgs. of methyl ergometrine intravenously at the time of anterior shoulder delivery.

Group B – 40 patients. Received 10 units of oxytocin diluted with 10 ml normal saline via the umbilical cord, immediately after clamping the cord.

Group C – 40 patients. Received 250 mg of carboprost intramuscularly with the delivery of anterior shoulder of the baby.

As soon as the signs of placental separation were evident, the placenta was delivered by controlled cord traction and the duration of third stage, blood loss during third stage and fourth stage (1 hour following delivery), side effects, incidence of retained placenta and or normal removal of placenta were noted. Data was analysed using students 't' test and test of proportions 'z' test.

Results

One hundred and twenty patients divided into 3 groups comprised the study. Age and Parity were comparable in all the three groups. 75-80% of patients had augmented labour. In less than 10% of the patients labour was induced. The remaining patients had spontaneous labour. Table I shows the high risk factors in the three groups of patients. The main risk factors were antepartum haemorrhage, instrumental delivery and parity > 4.

Table : I
High Risk Factors:

High Risk Factors	Group A	Group B	Group C
1. Parity > 4	5		
2. Hydramnious	2		
3. Twins/Triplets	3		1
4. Macrosomia > 4 kg.	1		
5. Antepartum Haemorrhage			
i) Placenta Praevia	2		1
ii) Abruption	1		
6. Prolonged Second stage of labour	2		
7. Instrumental delivery			
i) For failure of secondary Power	2		
ii) For prolonged second stage	5	3	
8. Oxytocin augmentation induction > 12 hrs	1		
9. Prolonged labour > 24 hrs	2	1	
Total	23	4	1

The mean duration of third stage of labour in three groups varied from 151 Secs. to 164 Secs. (Table II). However blood loss during this stage of labour was minimum in the carboprost group and maximum in methyl ergometrine group (Table III). Statistical analysis was found to be highly significant (P Value < 0.001) when carboprost was compared with methyl ergometrine and oxytocin group.

Table: II
Duration of Third Stage of Labour

Duration in Seconds	Group A (In = 40)	Group B (In = 40)	Group C (In = 40)
Mean	164 secs.	151 secs.	154 secs.
Range	10-435 secs.	20-401 secs.	10-420 secs.
Standard Deviation	± 95 secs.	± 71 secs.	± 93 secs.

Table : III
Blood Loss during Third Stage of Labour

Blood Loss (ml)	Group A	Group B	Group C
Mean	202.0	162.0	111.0
Range	10-1500	10-800	10-600
Standard Deviation	± 84.0	± 136.0	± 112.0

Groups	't' Value	'p' Value
A & B	3.55	< 0.001
A & C	8.92	< 0.001
B & C	3.64	< 0.001

The mean blood loss during the fourth stage of labour was maximum in oxytocin group and minimum with carboprost group (Table IV). Statistical analysis was significant when carboprost was compared with oxytocin group (P value < 0.00001) and when it was compared with methyl ergometrine (P value < 0.001).

Table : IV
Blood Loss during Fourth Stage of Labour

Blood Loss	Group A	Group B	Group C
Mean	67	190	47
Range	5-200	10-600	5-250

Groups	't' Value	'p' Value
A & B	2.33	< 0.05
A & C	4.23	< 0.001
B & C	8.45	< 0.00001

Fall in Haemoglobin concentration was also found to be less in carboprost group. Incidence of atonic postpartum haemorrhage (Table 5) was high in patients receiving Intraumbilical oxytocin (20%); Common high risk factors for atonic postpartum haemorrhage in this study were instrumental deliveries followed by twin gestation.

Table : V
Incidence of Atonic Postpartum Haemorrhage

Incidence	Group A	Group B	Group C
Number	3	8	2
%	7.5	20	5

Groups	Z	p Value
A & B	2.61	< 0.05
A & C	0.21	< 0.05
B & C	3.29	< 0.05

Table VI shows the side effects observed during 24 hours following delivery. Diarrhoea, headache and tachycardia were observed in carboprost group whereas increase in systolic BP > 10 mm of Hg was the commonest side effect found with methyl ergometrine. Intraumbilical oxytocin group had no side effects.

Table : VI
Side Effects Due to Drugs for 24 hrs. following Delivery

Side Effects	Group A (n=40)	Group B (n=40)	Group C (n=40)
1. Nausea & Vomiting	0	0	2
2. Diarrhoea	0	3	7 (17%)
3. Headache	3	6	4 (10%)
4. Increase in systolic BP > 10 mm Hg	4 (10%)	0	1
5. Tachycardia > 120 / mt	2	6	3

Discussion

In India Postpartum haemorrhage is still one of the most common causes of maternal morbidity and mortality. With the availability of uterotonic agents such as oxytocin, ergometrine and prostaglandins, prevention is possible.

Majority of patients in the present study were in the age group of 20-25 years and > 30% were multiparous. In 75% of the patients of each group the labour was augmented. The high risk factors like parity > 4, twins, antepartum haemorrhage and instrumental deliveries constituted more than 75% which is comparable to the study by Patki et al (1993) where similar risk factors were found.

The mean duration of third stage of labour in the present study was minimum with intraumbilical oxytocin (151 seconds) and maximum with methyl ergometrine (164 seconds); with carboprost it was 153 seconds. But the statistical analysis failed to demonstrate a significant difference in the duration when any two of the three drugs were compared. Similar observations were made by Girija et al (1994). The duration of third stage was less in all the three groups of our study compared to other studies (Bhide et al, 1994, Kamala Jayaram et al, 1994).

The mean blood loss during third stage in our study was least in the carboprost group (113 ml.) and maximum with methyl ergometrine (202 ml.) with intraumbilical oxytocin it was 162 ml. Statistical analysis also showed a significant difference of reduction in blood loss in carboprost group compared to other two groups. Girija et al (1994) noted blood loss was more in carboprost group (127.6 ml.) compared to methyl ergometrine (110.2 ml). Patki et al (1993) also noted blood loss less with carboprost group compared to methyl ergometrine. Abdel Aleem et al (1993) reported significant reduction in mean blood loss ($P < 0.001$) when carboprost was compared with methyl ergometrine.

Blood loss during fourth stage was more with intraumbilical oxytocin than with other agents. It may be due to the fact that the amount of oxytocin which is given via intraumbilical route may not be adequate enough to cause contraction of the uterus for a longer period of time thus resulting in increased blood loss in fourth stage.

Although all these drugs were equally effective in reducing the third stage duration, carboprost and methyl ergometrine reduce total mean blood loss during third and fourth stage significantly compared to intraumbilical oxytocin. This could be explained by the effect of carboprost on the uterus which persists for 3 to 4 hours compared to methyl ergometrine which lasts for 2 hours and oxytocin which persists for 30 minutes.

The incidence of postpartum haemorrhage in this study was 20% in the oxytocin group, 7.5% in the methyl ergometrine group and 5% in carboprost group. Similar results were observed in studies conducted by Kamala Jayaram et al (1993) and Girija et al (1994).

haemoglobin before and after delivery was only 0.24 gm% in carboprost group and it was significantly less when compared to other two groups.

Diarrhoea was an important side effect observed in the carboprost group (17%) followed by headache (10%). Whereas in the methyl ergometrine group, increase in the mean blood pressure > 10 mm of Hg was observed in 10% of patients. Similar results were found by Bhattacharya et al (1988). Patki et al (1994) noted in 50% of cases increase of mean Blood Pressure > 10 mm Hg.

There was significant decrease in duration of third stage and blood loss during third stage in carboprost group though side effects were more which can be reduced by antiemetics & anti-diarrhoeals.

Conclusion

15 (S) 15 methyl PG F2 a (Carboprost) was more effective and superior in reducing the duration of third stage and blood loss during third & fourth stage. There were no cardiovascular side effects, and hence can be given to hypertensive patients. Disadvantages: Expensive, but benefits outweigh the cost and side effects.

Methyl ergometrine – Equally effective and inexpensive. Has a role in developing countries.

Intraumbilical oxytocin supplemented by IV Oxytocin infusion in fourth stage – Effective especially in cases where both the above drugs are contraindicated.

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