



CRITICAL ANALYSIS OF EFFECT OF INTRAUMBILICAL INJECTION OF 20 UNITS OXYTOCIN ON 3RD STAGE OF LABOUR IN COMPARISON WITH INTRAMUSCULAR 10 UNITS OXYTOCIN INJECTION

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INTRODUCTION

Some 5,15, 000 women die each year in childbirth, mostly in developing countries. Severe bleeding in the postpartum period is the single most important cause of maternal deaths worldwide. More than half of all maternal deaths occur within 24 hours of delivery, most commonly from excessive blood loss. It is estimated that some 1,40, 000 women die each year from postpartum haemorrhage. Third stage of labour is the most important part of labour. This is the period from delivery of baby to delivery of placenta. After delivery of baby and cessation of umbilical cord pulsation the placenta separates from uterine wall through the spongy lining of the womb. The placenta separates as a result of capillary hemorrhage and the shearing effect of uterine contraction.

Life threatening complications are common in this stage of labour. They are postpartum hemorrhage and retained placenta and inversion of uterus. Postpartum hemorrhage is responsible for 25% of maternal death. PPH is therefore the most important maternal complication in labour and puerperium (AbouZahr2003). It occurs in 5% of all deliveries. Retained placenta occurs in 0.1-2% of deliveries. A recent study shows statistically significant increase in postpartum hemorrhage when the placenta was not delivered within 18 minutes of delivery of baby. (Magnon2005). Primary PPH occurs unpredictably in low-risk women. (Prendiville 2000)

Active management of labour aims at prevention of complications of the third stage. This includes prophylactic administration of a parenteral oxytocic drug, early clamping of umbilical cord and controlled cord traction.

Recommendations are

1. AMTSL reduces the risk of PPH and should be offered to all women (I-A)
2. Oxytocin (10 units) intramuscularly is the preferred medication and route for the prevention of PPH in low risk vaginal deliveries. It should be administered after the delivery of the anterior shoulder.
3. Intravenous infusion of oxytocin 20 units in 1000 ml is an acceptable alternative for AMTSL

Expectant management is the "hands off" policy, where signs of separation are awaited and the placenta allowed to deliver spontaneously or with aid of gravity or nipple stimulation. Intraumbilical injection of oxytocin for the treatment of retained placenta was first described by Mojon and Asdrubali in 1826 (Koerting 1926). The length of the third stage of labour, and its subsequent complications depends on the length of time it takes for placental separation and the ability of uterine muscle to contract. Principal management of third stage of labour aims at reducing the time of delivery of placenta so minimising serious adverse effects, such as blood loss and retained placenta. Umbilical vein injection of oxytocin directs the treatment of the placental bed and the uterine wall, resulting in an earlier uterine contraction and placental separation.

The purpose of this study was to find out the effect of intraumbilical injection of oxytocin in comparison with intramuscular oxytocin injection in reducing the blood loss during the third and fourth stages of labour, the length of the third stage of labour, and the reduction in the incidence of manual removal of retained placenta.

AIMS OF THE STUDY

1. To evaluate the efficacy of intraumbilical injection of oxytocin as a prophylactic oxytocic drug in AMSTL.
2. To study the effect of intraumbilical oxytocin in
 - Duration of third stage
 - Blood loss of third stage
 - Complication of third stage
 - Effects on the mother
3. Comparison of 10 units oxytocin Intramuscular injection with 20 units oxytocin in 20 ml normal saline intraumbilical injection in AMSTL.

MATERIALS AND METHODS

In this randomized comparative study 200 patients attending Government Rajaji Hospital Madurai for confinement during the period from November 2009 to October 2010 were recruited. They were divided into 2 groups.

GROUP-A- 100 patients received prophylactic 10 units IM Oxytocin inj. at the time of delivery of anterior shoulder.

GROUP-B- 100 patients received Prophylactic 20 units Oxytocin in 20 ml Normal saline intraumbilically after early cord clamping.

INCLUSION CRITERIA:

- Gestational age between 37-42 weeks
- Singleton pregnancy
- Live fetus
- Cephalic presentation
- Parity between 1 and 5
- Maternal age less than 35 years
- Vaginal birth

EXCLUSION CRITERIA:

- placental abruption
- placenta praevia
- history of any bleeding during pregnancy
- history of curette
- previous caesarean section or any uterine scar
- history of postpartum hemorrhage
- polyhydramnios
- signs and symptoms of maternal infections
- coagulation defects
- known uterine anomalies
- hemoglobin concentration less than 8 gms
- history of any medication during pregnancy
- prolongation of first stage of labour > 15 hours

METHODS

GROUP-A

100 patients were managed with 10 units oxytocin injection intramuscularly at the time of delivery of anterior shoulder.

GROUP-B

100 patients were given 20 units oxytocin diluted in 20 ml normal saline intraumbilical after early cord clamping. Blood loss was measured by a Blood collection Drape which was placed under the buttocks of the patient after the delivery of the baby so that the amniotic fluid is not included. This drape is left in place for one hour after delivery.

Blood soaked swabs were weighed and the known weight subtracted.

Other uterotonics were used if the blood loss was more or when the uterus was flabby.

Depending on the hemodynamic status of the patient and haemoglobin status in postnatal period blood transfusion or iron sucrose injection were given.

Side effects were asked for 24hours after delivery. In each case following parameters were monitored

1. Hemoglobin before & after delivery
2. Vitals before and after delivery
3. Duration of active stage+second stage
4. Labour-spontaneous or induced
5. Labour accelerated or not
6. Mode of delivery whether labour natural or labour natural with lacerated perineum or labour natural with episiotomy or outlet forceps with episiotomy
7. Birth weight
8. Amount of blood loss
9. Duration of third stage
10. Need for blood transfusion
11. Need for iron sucrose
12. Need for other oxytocics
13. Presence of PPH or retained placenta requiring manual removal
14. Side effects of drugs

MEASUREMENT OF BLOOD LOSS

- The amount of blood loss is calculated by the BRASSE V drape.
- It is a conical collection bag made of plastic which has got calibrations at the bottom to measure the blood loss.
- It is reusable.
- It is inserted under the patient’s buttocks after the baby is delivered and cord is clamped and cut.
- After collecting all the data, the data were tabulated and analysed.

RESULTS

Profile of cases studied

Table:1 Age distribution

Agein years	GroupA No	%	GroupB No	%
20-24	70	70	68	68
25-29	25	25	28	28
30&above	5	5	4	4
Total	100		100	
Mean	23.32		23.49	
S.D	2.947		3.164	
P	p = 0.695 Not significant			

Comparing the age distribution in both groups, majority of the patients were between 20-29 years 95% in Group A and 96% in Group B. Elderly group contributes to minority of the population (i.e) 5% in Group A and 4% in group B.

There is no significant difference in the mean age of the cases in both the groups.

Table:2 Gravidity distribution

Parity	Group A No.	%	Group B No.	%
Primi	65	65	67	67
Multi	35	35	33	33
Total	100		100	
P	p = 0.881 Not significant			

In this study primigravidae were more compared to multigravidae.

- In Group A-65% primi 35% multi
- Group B-67%primi 33%multi

The parity of the two groups does not have statistically significant difference.

Table-3 Type of labour

Type of labour	Group A No.	%	Group B No.	%
Spontaneous	52	52	45	45

Gel Induced	17	17	14	14
Augmentation	31	31	41	41
Total	100		100	
P	P =0.646 Not significant			

The type of labour was compared in both the groups. Majority of the patients in the groups had spontaneous onset of labour.(Group A 52% Group B 45%)

Labour was induced in 17% in Group A and 14% in Group B The type of labour did not differ significantly in both groups.

Table 4: Method of delivery

Mode of delivery	Group A No.	%	Group B	%
LN	2	2	3	3
LN withLP	2	2	--	--
LN with Epi	87	87	83	83
Outlet	9	9	14	14
Total	100		100	

In comparing the mode of delivery in both the groups, maximum number of patients were delivered by Labour natural with episiotomy 87% in Group A and 83% in Group B. 9% in Group A and 14% in Group B. were delivered by outlet forceps.

Table 5- Duration of active stage +II stage of labor

Duration in hrs	Group A No.	%	Group B No.	%
1-2hrs50mts	58	58	54	54
3-4hrs50mts	33	33	35	35
5hrs and more	9	9	11	11
Total	100		100	
Mean	2.72		2.97	
S.D.	1.38		1.39	
P value	p = 0.212 Not significant			

In comparing the active stage + third stage duration majority had duration less than 3 hours 58% in Group A and 54% in Group B.

Only 9% in Group A and 11% in Group B had duration more than 5 hours.

The mean duration of labour in Group A is 2.72 hrs and 2.96hrs in Group B.

Comparison of outcome parameters in the two groups

Table 6 : Changes in Haemoglobin

	GroupA At admission	After delivery	Group B At Admission	After delivery
Hb in gms	9.385	8.571	8.975	8.638
S.D	0.748	0.869	0.625	0.639
P value	< 0.001 Significant			

Hemoglobin level at admission is compared to the hemoglobin after delivery in both the groups.

Statistically there was significant difference in the changes in hemoglobin in the two groups.

Table:7 Duration of third stage

Duration in mts.	Group A No.	%	Group B	%
< 2	10	10	54	54
3-4	15	15	33	33
5-6	37	37	10	10
7-8	16	16	3	3
9-10	14	14	-	-
11-14	4	4	-	-
>15	4	4	-	-
Mean	6.52		2.82	
S.D.	3.963		1.513	
P value	p< 0.001 Significant			

10% had third stage duration upto 2 minutes in Group A and 54% in Group B. 68% had third stage duration of 3-8 minutes in Group A and 46% in Group B.

4% had more than 15 minutes in Group A and none of the patients in Group B exceeded 15 minutes. The mean duration of third stage in Group A is 6.52 minutes and 2.82 minutes in Group B.

There is statistically significant difference in the duration of third stage between both groups.

Table 8 : Amount of Blood Loss:

Blood loss in ml	Group A No.	%	Group B No.	%
0-50	6	6	25	25
51-199	34	34	43	43
200-349	39	39	23	23
350-499	14	14	6	6
>500	7	7	3	3
Mean	241.65		155.90	
S.D.	151.82		122.037	
P	p < 0.001 Significant			

In Group A 40% had blood loss less than 200ml. In Group B 68% had blood loss less than 200ml.

7% of the patients had blood loss of more than 500ml in Group A and 3% in Group B.

The mean blood loss for Group A is 241.65ml and 155.90ml for Group B.

The mean blood loss for Group A is lower than that of Group B and this difference is statistically significant.

Table 9: Use of Other Uterotonics

Drugs	Group A No.	%	Group B No.	%
Methergine	31	31	23	23
Methergine +synto.drip	11	11	6	6
Methergine +Synto.drip+Prostadin	5	5	3	3
P value	P = 0.416 Not significant			

31% needed methergin in Group A and 23% in Group B. 5% needed prostadin also in Group A and 3% in Group B.

The need for additional uterotonic is not statistically significant between the two groups.

Table 10: Need for Blood transfusion and Iron sucrose

	Group-A		Group-B	
	No.	%	No.	%
Blood transfusion	3	3	1	1
Iron Sucrose	11	11	3	3
P	p = 0.628 Not significant			

The need for postnatal blood transfusion for Group A is 3% and 1% for Group B.

Iron sucrose was need for 11% in Group A and 3% in Group B.

Table 11: Postpartum complications

	Group A No.	%	Group B No.	%
PPH	4	4	2	2
Retained placenta	1	1	0	0
p	P = 0.696 Not significant			

The incidence of PPH is 4% in Group A and 2% in Group B.

The incidence of Retained placenta is 1% in Group A and 0% in Group B.

Table 12 : Maternal effects 24 hours after delivery

Side effects	Group A No.	%	Group B No.	%
Nausea	1	1	-	-
Vomiting	1	1	1	1
Headache	1	1	1	1
Surgical evacuation	-	-	-	-
Fever	2	2	2	2
Abdominal pain	27	27	29	29
%	32	32	33	33

Side effects in Group A like nausea and vomiting was 2% in Group A and 1% in Group B

Fever was present in 2% in Both the groups. Abdominal pain was present in 27% in Group A and 29% in Group B.

DISCUSSION

Active management of third stage is one of the most important steps in prevention of postpartum hemorrhage.

This study was conducted in the Department of Obstetrics and Gynaecology, Government Rajaji Hospital, Madurai to assess the effect of intraumbilical injection of oxytocin on the third stage of labour in comparison with intramuscular oxytocin injection.

In this 100 patients were given 10 units oxytocin intramuscularly at delivery of anterior shoulder.

Another 100 patients were given 20 units oxytocin diluted in 20ml Normal saline intraumbilically soon after the cord clamping.

Discussion of profile of cases studied:

Age Group and Patient Selection

In our study, age group of patients studied varied from 20 to 35 years

- 90% of Group A were between 20-29 years.
- 96% of Group B were between 20-29 years.

This is similar to the study by Department of Obstetrics and Gynaecology, K.E.M. Hospital, Bombay which showed that the mean age of control and study group was 29.3 yrs and 29.1 yrs respectively.

Parity

In our study Primigravida were more in both compared to Multigravida. All were Term Singleton Low risk pregnancies.

- In Group A -65%-primi 35%-multi
- In Group B -67%-primi 33%-multi
- This is similar to the study by the Department of Obstetrics and Gynaecology and diagnostic imaging, Mississauga, Ontario which showed 40% multi and 60% primi in control group and 45% multi and 55% primi in study group.

Type of labour

In our study majority of patients in both groups had spontaneous onset of labour.

- Group A -52% spontaneous onset of labour.
- Group B -45% spontaneous onset of labour.
- Augmentation with oxytocin is done in
- 31% in Group A
- 41% in Group B
- This is similar to the study by Department of Obstetrics and Gynaecology, Maternity Port Royal Hospital, Paris, France which showed that 60% had spontaneous onset of labour in study group and 57% in control group.

Method of delivery

In our study maximum number of patients were delivered by labour natural with episiotomy 87% in Group A, 83% in Group B.

Instrumentation was 9% in Group A and 14% in Group B. This is similar to the study by Erzincan Military Hospital, Angers, France .90% were delivered by labour naturale in study group and 95% of the patients in control group.

Duration of active stage+third stage of labour

91% of patients had duration of active+ third stage less than 5 hours in Group A and 89% in Group B.

None of the patients had duration of labour more than 8 hrs.

This is comparable to the study by Guillermo carroli, Rosario, Argentina which showed that all patients had duration of labour less than 15 hrs

Comparison of outcome parameters in both groups**Changes in hemoglobin**

Haemoglobin estimation was done at admission of the patient and repeated 24-48 hrs after delivery.

Mean haemoglobin level of Group A

- At admission is 9.292gms%
- After delivery is 8.571gms%
- Mean haemoglobin level of Group B
- At admission is 8.975gms%
- After delivery is 8.638gms%

There is a statistically significant difference ($p < 0.001$) in the changes of hemoglobin in the 2 groups.

This is comparable to the study by Department of Obstetrics and Gynaecology, Atlanta medical centre, Atlanta, Georgia which showed

Mean haemoglobin level of control group

- At admission is 11.7gms%
- After delivery is 9.9gms%

Mean haemoglobin level of study group

- At admission is 12.1gms%
- After delivery is 10.8gms%

Duration of third stage of labour

In our study in Group A 62% had duration of third stage upto 6 minutes. In Group B 97% had third stage duration upto 6 minutes. There is significant reduction in the duration of third stage in the patients given oxytocin intraumbilically.

The mean duration of third stage of labour is shorter in intraumbilical group (6.52 +/- 3.9 compared to 2.82 +/- 1.8)

This result is similar to the study done by Nada abud-alhur Al-Ebrahimi Department of Obstetrics and Gynaecology United Arab Emirates, where the mean duration of third stage was 2.59 minutes in the study group and 7.67 minutes in the control group ($p < 0.001$).

Blood loss

In our study 40% of Intramuscular group had blood loss less than 200ml whereas 68% of intraumbilical group had blood loss less than 200ml

Mean blood loss of intramuscular group-241.65 ml

Mean blood loss of intraumbilical group -155.90 ml

This result is comparable to the study done by Gungorduuk K, et al, Mardin Women and Children Hospital, Mardin, Turkey, which showed mean estimated blood loss was significantly lower in women treated with oxytocin compared with women in the placebo group (195.3 +/- 81.0 mL compared with 288.3 +/- 134.1 mL, respectively; $P < .001$).

The incidence of PPH (i.e) more than 500ml in Group A is 4% and in Group B it is 2%.

Use of other uterotonics

47% of Group A needed additional uterotonics and only 32% needed additional uterotonics in Group B.

This result is comparable to the study done by Gazvani, Liverpool Women's Hospital, U.K., which showed use of other uterotonics in 40% in control group and 35% in study group.

Postpartum complications

Retained placenta was present in 1% of the cases in Group A and 0% in Group B

This result is comparable to the study done by Tehseen et al Department of Obstetrics and Gynaecology, Sargodha which showed an incidence of 1.2% of retained placenta in control group only

Massive PPH requiring Blood transfusion was 3% in intramuscular group and 1% in intraumbilical group. Iron sucrose was used in 11% of the cases in Group A and 3% of the cases in Group B.

This comparable to the study by Edgardo abalos et al which reduced risk of blood transfusion with intraumbilical oxytocin injection (4% vs 2%)

Maternal effects 24 hrs after delivery

Nausea, vomiting and headache was found in 3% in Group A and in 2% in Group B.

Surgical evacuation for retained placenta was not needed in both the groups.

Fever was present in 2% of the cases in both the groups.

This is comparable to the study done by Nada abud-alhur Al-Ebrahimi, Department of Obstetrics and Gynaecology, Arab Medical College which showed a higher incidence of increased blood pressure following delivery in the active management group (RR, 3.46; 95% CI, 1.68-7.09). This group also had a higher incidence of nausea (RR, 1.83; 95% CI, 1.51-2.23) and vomiting (RR, 2.19; 95% CI, 1.68-2.86). The slight trend in manual removal of the placenta and the significant increases in the rates of hypertension, nausea, and vomiting appear to be a function of the chosen uterotonic. These effects are noted with ergot preparations and not with oxytocin.

Abdominal pain was present in 27% in Group A and 29% in Group B

This result is comparable to the study done by Tehseen et al, Department of Obstetrics and Gynaecology, Sargodha. Their study showed that abdominal pain was experienced in study group but the difference was not found statistically significant.

SUMMARY

This study was conducted in Department of Obstetrics and Gynaecology, Government Rajaji Hospital, Madurai. Two hundred patients under this study were admitted in labour ward and after considering the inclusion criteria and exclusion criteria were divided into Group A and Group B.

Group A patients were given Oxytocin Intramuscularly
Group B patients were given Oxytocin intraumbilically

Results

- Age: 95% of the patients were between 20-29 yrs in Group A and 96% in Group B
- Parity: In Group A 65% were Primi and 35% were Multi. In Group B 67% were Primi and 33% were multi.
- Type of labour: In group A 52% had spontaneous onset of labour and 17% had induced labour. In group B, 45% had spontaneous onset of labour and 14% had induced labour.
- Method of delivery: 87% in Group A and 83% in Group B were delivered by labour naturale with episiotomy. 9% in group A and 14% in group B were delivered by outlet forceps.
- Fall in Hb level is significantly less in group B which is statistically significant
- Duration of 3rd stage: The mean duration of third stage in Group A is 6.52 minutes and 2.82 min in Group B
- Amount of blood loss: The mean blood loss was 241.65 ml in group A, and 155.9 ml in group B
- The user of other uterotonics: Methergine was needed in 31% in group A and 23% in group B. Prostin was needed in 5% in group A and 3% in group B.
- Blood transfusion and Iron sucrose: The need for postnatal blood transfusion for group A is 3% and for group B it is 1%, Iron sucrose was needed for 11% in group A and 3% in group B.
- Postpartum complications: The incidence of PPH is 4% in group A and 2% in group B. The incidence of retained placenta is 1% in group A and 0% in group B.
- Maternal effects 24 hrs after delivery: Nausea and vomiting was present in 2% in group A and 1% in group B. Fever was present in 2% in both the groups. Abdominal pain was present in 27% in group A and 29% in group B. Surgical evacuation of retained

placental bits was 0% in both groups.

CONCLUSION

- Intraumbilical oxytocin is very effective in the active management of third stage.
- 1. It reduces the blood loss and duration of third stage of labour. In intra umbilical group 91% of patients had blood loss less than 350 ml
- 2. The mean duration of third stage was 2.82 minutes in intra umbilical group
- 3. Complication of third stage like PPH is 2% in intra umbilical group and retained placenta is 0% in intraumbilical group.
On Critical evaluation intra umbilical oxytocin is more potent in reducing the amount of blood loss and mean duration of third stage of labour compared to intra muscular oxytocin in low risk population
- 4. Side effects like nausea, vomiting, headache, fever and abdominal pain are similar to intra muscular group.

REFERENCES

1. Prendiville et al, Active versus expectant management of third stage of labour. Cochrane database system Rev.2000.2
2. Edgardo abalos and associates, Active versus expectant management in the third stage of labour. International journal of Gynaecology and Obstetrics 2006;94:243-253.
3. Gulmezoglu et al (2002) Labour management: Oxytocin in the context of the millennium development goals. International journal of Gynaecology and Obstetrics, 90,251-257.
4. Sadaq Rafiq et al, A study of etiology and management of postpartum hemorrhage, at Nishtar medical college and hospital, Multan. Issue year:2009 Issue no.5, Issue month: December
5. McDonald & Middleton 2008, Active management of the third stage of labour : difference between delayed and early cord clamping A 2008 Cochrane review
6. Department of Reproductive Health Research. Managing complications in pregnancy and childbirth: a guide for midwives and doctors. Geneva: WHO; 2000.
7. M.L. McCormick et al, Active Management of third stage of labour, International journal of Gynaecology and Obstetrics 77, 2002; 267-275
8. Athavale RD, Nerurkar NM, Dalvi SA, Bhattacharya MS. Umbilical vein oxytocin in the management of third stage of labour. J Postgrad Med 1991;37:219
9. Gungorduuk K, et al, Using intraumbilical vein injection of oxytocin in routine practice with active management of the third stage of labor: a randomized controlled trial 2010-09, Obstet Gynecol., 116(3):619-24.
10. Neebha Ojha, Active management of third stage of labour by oxytocin: Umbilical vein versus intramuscular use N. J. Obstet. Gynaecol Vol. 2, No. 1, p. 13 - 16 May-June 2007.