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A comparative study of intraumbilical oxytocin versus Intravenous methylergometrine in active management of third stage of labour

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Abstract
Aim: To compare the efficacy of intraumbilical Oxytocin and intravenous Methyl ergometrine in active management of third stage of labour.
Material and Methods: The present study was conducted in the Department of Obstetrics and Gynaecology, Katihar Medical College and Hospital, Katihar, Bihar, India. Total 600 patients were include in the study and divided in two groups. In Group A, 10 Unit of oxytocin diluted in 20 ml of normal saline with mild force into the umbilical vein about 2 inches away from vulva immediately after clamping the cord after delivery is given in 300 patients whereas in group B, intravenous 0.2mg of methylergometrine at the time of delivery of anterior shoulder of baby was given.
Results: Mean blood loss in intra-umbilical oxytocin group was 211.75 ml while in I.V. methergin group it was 214.25 ml. Median in intra-umbilical oxytocin group was 223.15 ml with range of 50- 370 ml. In I.V. methergin group, median was 221.25 ml with range 50-345 ml. The difference was statistically not significant (p =0.30).
Conclusion: the method of intra-umbilical injection of oxytocin immediately after the delivery of the baby, significantly reduced the duration of the third stage of labour and the amount of blood loss in the third stage of labour is comparable to the intravenous methergin.

Keywords: postpartum hemorrhage, Active management of third stage of labor, blood loss, duration of third stage

Introduction

Around 830 women die from pregnancy or childbirthrelated complications all over the world every day [1]. Between 1990 and 2015, maternal mortality worldwide dropped by about 44% [1, 2]. According to World Health Organisation, 25% of all maternal deaths are caused by post- partum haemorrhage (PPH) which is a preventable cause of maternal mortality and morbidity [3]. India takes up 17% of the global burden of maternal mortality with the national average of 167 while in Assam it is still high with 300 per lakh live births [4].

Postpartum bleeding or postpartum haemorrhage (PPH) is defined as more than 500 ml of blood following childbirth, or 10% drops in haematocrit from the admission to post-delivery or till the end of puerperium. Active pharmacologic management of the third stage of labour is common today and has resulted in a significant decrease in early and late postpartum haemorrhage and in total maternal peri-partum mortality and morbidity [5]. AMTSL involves the use of prophylactic uterotonic drug within 1-2 minute of birth, expulsion of placenta by controlled cord traction followed by uterine massage. Drugs used for prophylaxis of atonic postpartum haemorrhage include oxytocin, ergometrine and prostaglandins. The routine practice in AMSTL is oxytocin 10U I/M given within 2 mins of delivery of baby. The onset of action of I/M oxytocin is 3-5mins and persist for 2-3 hrs. One of these methods is the administration of oxytocin via the umbilical vein for the delivery of placenta. Umbilical vein oxytocin injection directs treatment to the placental bed and uterine wall, resulting in earlier uterine contraction and placental separation. The mechanism of this method is that oxytocin injected into umbilical vein reaches the placental bed in a relatively high concentration. This stimulates contraction of the uterine muscle and a decrease in the area of placental implantation site. The resulting tension causes the decidua spongiosa, the weakest layer, to give way and cleavage takes place at this site. The hematoma formed in this area accelerates the process, and the placenta eventually separates and is delivered [6]. This method was found to be quick, non-invasive, simple and safe method for separation and delivery of placenta in third stage of labor.

A review of literature in 2006 by WHO highlighted the common cause of PPH as uterine atony and majority of women with PPH have no identifiable risk factor [7]. Active management of third stage of labour (AMTSL) can prevent PPH and thereby prevent maternal death [8, 11]. Hence the present study was conducted to compare the efficacy of intraumbilical Oxytocin and intravenous Methyl ergometrine in active management of third stage of labour.

Material and Methods

The present study was conducted in the Department of Obstetrics and Gynaecology, Katihar Medical College and Hospital, Katihar, Bihar, India.

After taking informed consent and the approval of the protocol review committee and institutional ethics committee.

Inclusion criteria

- All women who aged between 18-35 years.
- Cephalic presentation,
- Singleton pregnancies,
- Gestational age more than 37 weeks,
- Previous normal vaginal delivery,

- Hb ≥ 11g/dl.

Exclusion criteria

- Patients with prolonged first & second stage of labour, uterine inertia & instrumental deliveries.
- Previous caesarian section.
- Antepartum haemorrhage.
- Multiple gestation.
- Polyhydromnios.
- Preterm deliveries.
- Malpresentations.
- Medical disease like heart disease, hypertension, severe anemia.
- Uterine malformation.

Grouping

Group A: With intra-umbilical oxytocin injection in 300 cases.

Group B: With intravenous methylergometrine injection in 300

Methodology

In Group A, 10 Unit of oxytocin diluted in 20 ml of normal saline with mild force into the umbilical vein about 2 inches away from vulva immediately after clamping the cord after delivery is given in 300 patients whereas in group B, intravenous 0.2mg of methylergometrine at the time of delivery of anterior shoulder of baby was given. Approximate blood loss was measured in both groups by measuring the blood in kidney tray and blood-stained linens and pads excluding the dry weight of these items. In both group hemoglobin was measured before delivery and 24 hours after delivery.

Primary outcome were measured such as duration of 3rd stage of labour, Amount of blood loss during third stage of labour and maternal hemoglobin measured on admission and repeated 24 hours after delivery. The secondary outcome such as Need for manual removal of placenta and any others 3rd stage complication.

Statistical analysis

The recorded data was compiled entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviation

Results

Table 1: Duration of 3rd stage of labour (in minutes) in intra-umbilical oxytocin group and I.V. methergin group

Groups	Duration of 3rd stage in minutes			
	1-2	3-4	5-7	7-10
Intra Umbilical Oxytocin Group				
No. of Patient	112	110	78	-
%	37.33	36.67	26	-
I.V. Methergin Group				
No. of Patient	110	125	65	-
%	36.67	41.67	21.66	-

Table 2: Mean Duration of 3rd stage of labour in intra-umbilical oxytocin group and I.V. methergin group (in minutes)

Parameters	Intra-Umbilical Oxytocin Group	I.V. Methergin Group
Mean□SD	3.29□1.61	3.32□1.50
Median	3.1	3.1
Range	1-7	2-8

Table 3: Blood Loss compared in intra-umbilical oxytocin group and I.V. methergin group

Groups	Blood Loss (in ml)			
	<100	100-200	201-300	>300
Intra-Umbilical Oxytocin Group				
No. of Patients	16	121	146	17
Percentage	5.33	40.33	48.67	5.67
I.V. Methergin Group				
No. of Patients	17	120	150	13
Percentage	5.67	40	50	4.33

Table 4: Correlation of hemoglobin changes in intra-umbilical oxytocin group and I.V. methergin group

	Hemoglobin change in gms			
	□0.5	0.6-1	1.1-1.5	1.6-2
Intra-umbilical oxytocin group				
No. of Patients	82	142	68	8
Percentage	27.33	47.33	22.67	2.67
Mean difference in Hb	0.31	0.78	1.27	2.2
I.V. Methergin group				
No. of Patients	52	166	71	11
Percentage	17.33	55.33	23.67	3.67
Mean difference in Hb	0.37	0.75	1.41	1.69

Table 5: Placental weight and its correlation with blood loss

	Placental weight (in gms)		
	<400	**400-500**	**>500**
Intra-Umbilical Oxytocin Group			
No. of Patients	28	163	109
Percentage	9.33	54.34	36.33
Mean Blood Loss	74 □ 39.77	189.48 □ 54.75	292.77 □39.90
I.V. Methergin Group			
No. of Patients	25	156	119
Percentage	8.33	52	39.67
Mean Blood Loss	75 □ 55.87	185.40 □ 47.62	286 □ 38.27

Table 6: Correlation of blood loss with parity in intra-umbilical oxytocin group and I.V. methergin group

	Average blood loss in parity		
	Primi	**Second**	**Multi**
Intra-umbilical oxytocin group (Blood Loss)	110.82 ml (□87.67ml)	211.73 ml (□86.75)	287.55 ml (□74.01)
I.V. Methergin group (Blood Loss)	141.25ml (□82.88)	227.10 ml (□74.71)	291.65 ml (□67.11)

Table 7: Correlation of blood loss with episiotomy

Group	Episiotomy		Intact Perineum	
	No.	**Average blood loss (ml)**	**No.**	**Average blood loss (ml)**
Intra-umbilical oxytocin group	159	269.87 (□83.83)	141	141.57 (□70.74)
I.V. methergin group	200	257.45 (□73.95)	100	137.06 (□62.45)

Table 8: Comparison of side effect in intra-umbilical oxytocin group and I.V. methergin group

Side Effects	Intra-umbilical oxytocin group		I.V. methergin group	
	No. of patients	**%**	**No. of patients**	**%**
Nausea and Vomiting	0	0	46	15.33
Headache and vertigo	0	0	53	17.67
Tachycardia	0	0	77	25.67
Change in B.P.	0	0	57	19
PPH	0	-	0	-
Retained Placenta	0	-	0	-
Use of additional oxytocics	0	-	0	-

Discussion

The use of oxytocics immediately after the delivery of the baby is one of the most important intervention, to prevent postpartum blood loss, as uterine atony is the most important and common cause of postpartum haemorrhage. The active management of third stage of labour with routine prophylactic administration of oxytocics at the time of delivery of the anterior shoulder of the fetus has been shown to reduce the risk of postpartum haemorrhage [12, 13].

Several studies have reported intraumbilical oxytocin to be effective in reducing the duration of third stage of labour and blood loss. Dahiya *et al*. managed 50 study cases with 10 units of oxytocin diluted in 20ml saline given through umbilical vein immediately after cord clamping and 50 control, managed actively with 10 units of oxytocin diluted in 250 ml saline at rate of 125 ml/hr I/V, given after delivery of the baby [14]. He reported significant reduction in duration of third stage of labour (1.48min vs 3.27min), fall in haemoglobin (<1.2g/dl vs 1.96g/dl) and fall in haematocrit (<3.88% vs 7.2%) in cases as compared to control.

Recent studies show that there are still wide variations in practice around the world in the management of third stage of labour [15] Methyl ergometrine is a conventional oxytocic used extensively but is associated with unpleasant side effects like hypertension.

Current oxytocic drugs are far from ideal particularly for routine use in developing countries, where simple route of administration, and stable, inexpensive drugs are needed because many deliveries take place far from hospitals and are supervised solely by birth attendants.

The present study showed that 10 IU oxytocin Intaumbilical is as effective as 0.2 mg methyl ergometrine IV in preventing blood loss with relatively no side effects. Several studies and systematic reviews have been published on the use of intraumbilical oxytocics, but these studies assessed the use of intraumbilical oxytocin for the treatment of retained placenta instead of postpartum hemorrhage.[16-19] The National Institute for Health and Clinical Excellence (NICE) guidelines in the United Kingdom have recommended the use of umbilical oxytocin for the treatment of retained placenta [20]. A few trials have investigated the routine use of intraumbilical oxytocin with active management of the third stage of labor [21, 23]. However, the findings of those trials are conflicting. From the existing evidence, it would appear that the routine use of intraumbilical oxytocin for the prevention of postpartum hemorrhage is questionable.

Conclusion

We concluded that the method of intra-umbilical injection of oxytocin immediately after the delivery of the baby, significantly reduced the duration of the third stage of labour and the amount of blood loss in the third stage of labour is comparable to the intravenous methergin. We need large randomarized trial to implement its use in the active management of third stage of labour. Hence, the results of the this study are applicable in under- resourced settings where complications of third stage of labor are common and

facilities for immediate blood transfusion and surgical intervention are limited.

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