Active Management of Third Stage of labour : Umbilical vein Oxytocin versus prophylactic Methergin & effect on Maternal Blood Presure

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Summary: In a total number of 140 patients, out of which 110 were normal deliveries (Group Ia) and 30 were lower segment caesarean sections (group IB), 5 units of oxytocin in 10 ml of normal saline was instilled into umbilical vein of the cord immediately after delivery of the baby. Sixty patients were treated as control with 0.25 mg of Methergin IV.

In the study groups injection and expulsion of placenta interval was 30 sec to 4 minutes, mean being 1 min 10 sec in group Ia and 30 sec to 1 min, mean being 46 sec in group Ib. While in group II it was longer ranging from 45 sec to 6 min with an average of 1 min 40 sec.

The amount of blood loss in group Ia was 20 to 100 ml (average 45 ml), group Ib 40 to 110 ml (average 60ml) and in group II 40 to 120 ml (average 65 ml). The systolic blood pressure increased more than the diastolic pressure in Groups Ia & Ib at 1 minute and seen in more number of cases of PIH. In Group II diastolic BP also rose in more percentage of normotensive cases and all the PIH cases.

It is concluded that this method of active management of IIIrd stage of labour is ideal following normal delivery and also lower segment caesarean section (both elective and in labour) with shortened injection placental delivery interval and minimal blood loss. But its effect is not sustained in cases of prolonged labour.

Introduction :

A prolonged third stage of labour is often associated with increased risk of maternal mortality and morbidity due to P.P.H. Instillation of oxytocin into the umbilical vein is a simple, safe, inexpensive, noninvasive method for the active management of third stage of labour. Its use in primis and multigravidae, patients with and without P.I.H., following vaginal delivery and caesarean section, following normal labour and prolonged labour and elective lower segment caesarean section is compared with the use of prophylactic methergin which is an accepted procedure. We have found it to be very effective, simple and safe even in patients with hypertension with quicker placental seperation and lesser blood loss than prophylactic methergin but not effective in cases of prolonged labour.

Table I
Total No. of Cases - 200

Group	No. of cases	Route of delivery	Drug given & Route of admin.
Ia	110	Vaginal	5 units Oxytocin In 10 ml of N.Saline into
Ib	30	LSCS	Umbilical vein
II	60	Vaginal	0.25 mg Methergin IV

Materials and Methods:

This study was conducted in department of obstetrics and gynaecology, Niloufer Hospital for women and children, Osmania Medical College, Hyderabad.

Total number of cases studied were 200 divided into 3 groups. Goup Ia and Ib both had 5 units of Oxytocin (diluted in 10ml normal saline) instillation into the umblical vein immediately following vaginal and caesarean section deliveries respectively. Group II received prophylactic methergin 0.25 mg IV.

Age of the patients studied varied from 18 to 36 years. Their parity ranged from 1-7 in both groups. The mode of delivery was spontaneous vaginal in 95 cases in Group Ia and forceps delivry in 15 cases. There were 50 cases with spontaneous vaginal delivery and 10 cases of forceps delivery in Group II. There were 20 cases of PIH in Ia, Ib and 10 cases of PIH in Group II. The number of cases of prolonged labour were 4, 2 and 10 respectively in Ia, Ib, and II. The duration of Ist stage 2-18 hours (Average 6 hrs) in group Ia and 2-20 hours (Average 7 hrs) in group II. Duration of II stage was 5-35 min (Average 25 min) in Group Ia and 5-40 min (Average 30 min) in Group II.

Table II
Material

Age of patients	18-36 years		
Parity	1-7		
Mode of delivery	Group Ia	Ib	II
Vaginal	95	-	50
Forceps	15	-	10
LSCS	-	0.30	-
No. of cases with			
Prolonged labour	4	2	10
Duration of I Stage	2-28 hrs		2-20 hrs
	(Av.6 hrs)		(Av.7 hrs)
Duration of II Stage	5-35 min		5-40 min
	(Av. 25 min)		(Av. 30 min)

Table III

	Group Ia	Group Ib	Group II
% of spontaneous expulsions	100%	100%	90%
Injection Expulsion Interval	30 sec-4 min	30 sec- I min	45 sec-6 min
Mean	I min 10 sec	46 seconds	I min 40 sec
Blood Loss	20-100 ml	40-110 ml	40-120 ml
Mean	45 ml	60 ml	65 ml

6 cases in Group II placenta was seperated and was lying within the uterine cavity.

Table IV
Results in cases of Prolonged Labour

Group	No.of Cases	Injection delivery Interval	Relaxation of uterus %		Bl.loss	Rx given
Ia	4	50 sec-2 min	4	100%	100-150 ml	10 units Oxytocin drip
Ib	2	30sec – 50sec	2	100%	100&150 ml	10 units Oxytocin drip
II	10	I min – 3 min	2	20%	100 ml	10 units Oxytocin drip

Table V

Changes in BP at min and 5 min after administration of the drug

			1 min	% of cases	5 min
Group Ia	(N)	63 / 18	S 10-20 mm Hg / D 5-10 mm Hg	70% / 20%	(N)
	PIH	16 / 10	S 10-20 mm Hg / D 5-10 mm Hg	80% / 50%	Baseline BP
Group II	(N)	40 / 25	S 10-20 mm Hg / D 10 mm Hg	80% / 50%	(N)
	PIH	10 / 10	S 10-40 mm Hg / D 10-20 mm Hg	100% / 100%	S 10-20 mm Hg / D 10 mm Hg

Table VI

Injection Delivery Interval

Neri et al (1966)	—	3.3 mins.
Jain et al (1986)	—	1.77 mins.
Raut et al (1990)	—	3.16 mins.
Singh et al (1993)	—	1.96 mins.
Virginia et al (1989)	—	4.1 mins
Present study	—	1.10 mins

Results:

The duration of time taken for placental seperation, blood loss during 3rd stage, changes in BP at I min and 5 min after the drug and other complications were noted compared in both groups as shown in Table III.

In the 6 cases with prolonged labour in Group Ia & Ib in all cases the uterus relaxed 20-30 min after further drip of oxytocin 10 units in 5% glucose with a further blood loss of 100-150 ml. Out of 10 cases of prolonged labour in Group II, in 2 cases the uterus relaxed after 30 min with further blood loss of 100 ml in each case. Uterus contracted again with 10 units Oxytocin drip. The causes for prolonged labour were occipito-posterior, Breech presentation, twins, Hydramnios, hypotonic uterine inertia and PROM.

The systolic BP increased more than diastolic in groups Ia & Ib at 1 min and seen in more no. of cases in the PIH group. At the end of 5 min the BP returned to baseline level. In group II the diastolic BP also rose in more percentage of cases with normal BP. In patients with PIH, the rise in systolic as well as diastolic BP was higher at 1 min in all cases and this rise persisted at the end of 5 min in all cases.

Discussion :

Prophylatic methergin is given to reduce the blood loss in 3rd stage of labour, but it is not always possible to time it accurately in a busy labour room with limited staff. In addition it aggravates the vasospasm in cases of PIH and is also contraindicated in heart disease cases.

Neri et al in 1966 introduced the method of giving oxytocin 5 units in 10 ml of normal saline into the umbilical vein to enhance the seperation of placenta in cases of retained placenta and noticed that the mean injection placental expulsion interval was found to be

3.3 min. Golan et al (1983), Herinonen and Pikhala (1985) and Chestnut and Lovi (1987) tried this method for treating retained placenta.

However, this procedure was followed in the active management of IIIrd stage of labour by instillation of 5 units oxytocin in 10 ml. of normal saline into the umbilical vein immediately after 2nd stage of labour and Jain et al (1986) found that this method reduced the injection expulsion of placenta period to 1.77 min. Raut ' 1990) reported the period as 3.16 min ± 1.53 min as compared to his controls which was 4.16 ± 3.79 min. Singh et al (1993) reported the injection placental expulsion interval as 1.96 + 0.43 Chowdary et al (1991) reported 1.45 ± 1.24 min (Table VI). Our results were comparable with those of Jain et al (1986), Chowdary et al (1991), Singh et al (1993) and less than that of Raut (1990) Chestnut and Lon (1987) did not find any significant difference in injection expulsion interval with control group of normal saline instillation but it could be because the drug was injected 5 minutes after the delivery of the baby.

Oxytocin injected into the umbilical vein reaches the placental bed in a relatively higher concentration. This stimulates a contraction of the uterine muscle and a decrease in the area of the placental implantation site. The resulting tension causes the decidua spongiosa, the weakest layer to give way and cleavage takes place at that site. The haematoma formed at this area accelerates the process and the placenta eventually seperates and is delivered with minimum amount of blood loss.

The use of oxytocin in cases of PIH is quite safe as the changes in the BP are not very high and it also causes relaxation of smooth muscles of the vessels. The initial rise in BP following oxytocin instillation could be due to the increased cardiac output from the increased blood volume from the placental site. Hypotension was not observed because oxytocin bolus was not injected directly into the maternal circulation. The action of oxytocin is not sustained enough (½ life 3 min) to cause retraction of the uterus in cases of prolonged labour whereas methergin with it's sustained action is more effective in those cases.

Conclusion :

Oxytocin instillation into umbilical vein after delivery of the baby is ideal following normal delivery and also following caesarean section (both elective and in labour) with shortened injection placental delivery interval and minimal blood loss. But it's effect is not sustained in cases of prolonged labour

Prophylactic methergin has a slightly longer injection delivery interval and sometimes the seperated placenta may lie within the uterine cavity due to closing up of the cervix. It is contraindicated in patients with PIH and also in patients with hypotension due to intense peripheral vasoconstriction. However it's sustained action is more effective in casess of prolonged labour.

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