



Intramuscular $\text{PGF}_2 \alpha$ 125 μg versus intravenous methyl ergometrine 0.2 mg in the active management of third stage of labor

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OBJECTIVE(S) : To assess, evaluate and compare the safety and efficacy of intramuscular $\text{PGF}_2 \alpha$ 125 μg and intravenous methergin 0.2 mg in the active management of third stage of labor.

METHODS(S) : Two hundred selected cases were divided in two groups of 100 each. In Group I $\text{PGF}_2 \alpha$ 125 μg was given intramuscularly and in Group II 0.2 mg methergin was given intravenously at the time of delivery of the anterior shoulder of the fetus. The duration of the third stage, amount of blood loss, side effects, and complications if any were noted and analyzed.

RESULTS: The mean duration of the third stage of labor from the injection of the oxytocic to the expulsion of the placenta was significantly shorter in Group I (3.84 \pm 1.10 minutes) as compared to that in Group II (5.16 \pm 1.58 minutes) ($P < 0.0001$). The mean blood loss was also significantly less in the study group (74.84 \pm 27.16 mL vs 93.6 \pm 32.69 mL ; $P < 0.0001$). The only side effects were nausea and vomiting in two women in Group I.

CONCLUSION(S): Intramuscular $\text{PGF}_2 \alpha$ 125 μg is a better alternative to intravenous methergin 0.2 mg in the active management of third stage of labor.

Key words : active management of third stage of labor, $\text{PGF}_2 \alpha$, methergin.

Introduction

Postpartum hemorrhage is still one of the leading causes of maternal mortality in the developing countries. Though it complicates only 5-10% of the deliveries, it accounts for nearly one fourth of the maternal deaths. Hence, active management of third stage of labor is the most important step towards reduction in the maternal mortality.

Use of an oxytocic has been recommended since long time. Methyl ergometrine given at the time of delivery of anterior shoulder has been reported to result in significant reduction in the blood loss of the third stage of labor ¹.

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Prostaglandins are the natural stimulant of the myometrial activity and have proven to be effective in induction of labor and abortion. Use of prostaglandins in the active management of labor is an extension of their use in obstetrics. $\text{PGF}_2 \alpha$, a synthetic derivative of prostaglandin, has an advantage that it can be given intramuscularly, is more potent and is longer acting than natural prostaglandin. The present study was undertaken to analyze the efficacy of $\text{PGF}_2 \alpha$ in the active management of third stage of labor.

Methods

Two hundred women with singleton pregnancy, spontaneous onset of labor at term, and vertex presentation admitted in active phase of labor were included in the study. Those having hypertension, cardiac disease, renal disease, gastrointestinal disorders, respiratory disease, endocrinal problems, coagulation disorder, and sensitivity to prostaglandin or methergin were excluded from the study.

They were randomly divided using random number tables in

two groups of 100 each. Group I received 125 µg PGF₂ α intramuscularly and Group II received 0.2 mg methergin intravenously at the time of the delivery of the anterior shoulder. The interval between injection and expulsion of the placenta, amount of blood loss, third stage complications, side effects, and need for second injection of additional drug were noted. Blood loss was estimated by blood and blood clots collected in the kidney tray and adding the difference in the weight of the drapes before use and after delivery. The data were analyzed.

Results

There were 50 primiparas and 50 multiparas in each of the two groups. Majority of the women were from rural areas. The two groups were well matched in terms of gravidity, parity and age. (Table 1).

Table 1. Comparison of the two groups.

	Group I (Prostaglandin) n=100	Group II (Methergin) n=100
Primipara	50	50
Multipara	50	50
Urban residence	75	62
Mean gravidity	1.75 ± 0.87	1.67 ± 0.85
Mean parity	0.71 ± 0.66	0.61 ± 0.60
Mean age (years)		
Primiparas	22.61 ± 3.27	23.33 ± 4.26
Multiparas	22.41 ± 2.94	24.50 ± 3.36
Mean duration of 1 st stage (hours)		
Primiparas	10.81 ± 1.97	9.92 ± 0.69
Multiparas	8.75 ± 12.80	8.80 ± 2.25
Mean duration of 2 nd stage (minutes)		
Primiparas	31.12 ± 10.2	31.13 ± 7.2
Multiparas	27.71 ± 10	28.81 ± 8.96

The mean duration of 1st stage of labor was 10.81±1.97 and 9.92 ± 0.69 hours amongst primiparas in Group I and Group II respectively. It was 8.75 ± 2.80 and 8.80 ± 2.25 hours amongst multiparas in Group I and Group II respectively. (Table 1).

The mean duration of the 2nd stage of labor was 31.12 ± 10.2 minutes and 31.13 ± 7.2 minutes amongst primiparas and 27.71 ± 10 minutes and 28.81 ± 8.96 minutes amongst multiparas in Group I and Group II respectively.

In Group I the mean duration of 3rd stage of labor was not statistically significantly different in multiparas as compared to that in primiparas 3.02 ± 1.12 vs 3.41 ± 1.10 minutes (P = 0.0821) (Table 2). Similarly in Group II the mean duration of third stage of labor was 5.01±1.10 minutes in multiparas compared to 5.29±1.26 minutes in primiparas (P = 0.3751) (Table 2). The mean duration of 3rd stage of labor in primiparas was significantly less in Group I than that in Group II (3.41 ± 1.10 vs 5.29 ± 1.83 minutes; P<0.001) and so was it in multiparas in Group I compared to that in Group II (3.02 ± vs 5.01 ± 1.26 minutes; P<0.001). However, the mean duration of 3rd stage was significantly less in Group I as compared to that in Group II (3.84 ± 1.12 vs 5.16 ± 1.58 minutes; P< 0.0001). (Table 2).

The mean amount of the blood loss was also significantly less in Group I as compared to that in Group II (74.84 ± 27.16 vs 93.6 ± 32.69 mL, P < .0.0001) (Table 3).

In none of the women was the placenta retained in any of the groups. The additional dose of the drug was required in two cases in the methergin group and none in the prostaglandin group.

Table 2. Duration of the third stage.

Duration of third stage (minutes)	Group I (Prostaglandin) n=100					Group II (Methergin) n=100				
	Primiparas		Multiparas		P Value	Primiparas		Multiparas		P Value
	No	%	No	%		No.	%	No	%	
1-2	13	26 ^a	14	28 ^b	0.021	1	2 ^a	10	20 ^b	0.004
3-4	26	52 ^c	20	40 ^d	0.548	17	34 ^c	23	42 ^d	0.189
5-6	10	20 ^e	15	30 ^f	0.248	30	50 ^e	11	22 ^f	0.0001
7-8	1	2 ^g	1	2 ^h	-	2	4 ^g	6	12 ^h	0.1403
Mean ± SD	3.41 ± 1.10 ⁱ		3.02 ± 1.12 ^j		0.0.821	5.29 ± 1.83 ⁱ		5.01 ± 1.26 ^j		0.3751
	3.84 ± 1.12 ^k					5.16 ± 1.58 ^k				

^a P < 0.005 ^b P = 0.3490 ^c P = 0.032 ^d P = 0.5446
^e P = 0.0290 ^f P = 0.3616 ^g P = 0.557 ^h P < 0.05
ⁱ P < 0.001 ^j P < 0.001 ^k P < 0.0001

Table 3. Amount of blood loss .

Blood loss	Primiparas			Multiparas			Group I	Group II	P value
	Group I	Group II	P value	Group I	Group II	P value			
Mean									
±SD	87.7±2.15	100.78±33.2	0.0214	61.77±27.1	93.67±31.00	<0.0001	74.86 ± 27.16	93.60±32.69	P < 0001

Table 4. Comparison with other studies.

	Anjaneyulu et al ¹	Devi et al ³	Bhattacharya et al ⁴	Present study
Blood loss (mL)				
Prostaglandin ^a	95.12 ± 89,9	99.8 ± 155	73.09 ± 44	74.86 ± 27.16
Methergin ^b	154.9 ± 105.6	283 ± 108	145 ± 15.1	93.6 ± 32.69
Duration of 3rd stage (minutes)				
Prostaglandin ^a	3.5 ± 1.1	4.8 ± 0	4.8 ± 0.8	3.64 ± 1.12
Methergin ^b	6.1 ± 2.1	10.9 ± 0.5	8.06 ± 0.6	5.16 ± 1.58

^aPGF₂α 125 ug intramuscular^bMethergin 0.2 mg intravenous

The only side effects noted were nausea and vomiting in two cases in the prostaglandin group which were not severe enough to need energetic management.

Discussion

Kerkes and Domokos ² recorded changes in the intraumbilical artery pressure with an open catheter and Hewlett Packard 8020 after treating the cases with PGF₂α, (n=6), ergometrine (n=3), and physiological saline (n=4). They found a marked rise of 60 mm of Hg in the pressure and a sustained contracture response of the myometrium with PGF₂α as compared to minimal response with ergometrine. They observed similar results after intra- myometrial injection of PGF₂α during cesarean section when a wave of contractions was seen starting from the site of injection and spreading to the distal segment of the uterus .The sustained contracture superimposed with cyclical contractile uterine activity resulted in rapid separation and expulsion of the placenta, and the sustained contraction resulted in significant control of blood loss.

In the present study also we observed a significant reduction in the duration of the 3rd stage in the PGF₂α group as compared to that in the methergin group. Similar observations were made by other authors as well ^{2,4} (Table 4).

The 3rd stage blood loss was 15% less in primiparas and 30% less in multiparas in the prostaglandin group as compared to that in the methergin group. The mean blood loss was 74.86 ± 27.16 mL in the prostaglandin group as

compared to 93.60±32.69 mL in the methergin group (P<0.0001) (Table 3). Similar results were obtained by various other authors as well (Table 4).

Singh and Megh ⁵ observed nearly 50% reduction in the mean blood loss using 250 □g of PGF₂α in comparison to that with methergin. The side effects observed with prostaglandin were very minimal in the form of nausea and vomiting in two cases only. Anjaneyulu et al ¹, and Bhattacharya et al ⁴ noted diarrhea as the most common side effect with vomiting in only 2% of the cases receiving prostaglandin while Singh and Megh ⁵observed vomiting as the main side effect in the prostaglandin treated group.

Conclusion

The PGF₂α 125 □g given intramuscularly is a safe and effective alternative to methergin for the active management of labor. It results in significant reduction in the blood loss which is so important in the anemic women of our country.

Reference

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