

# COMPARISON BETWEEN PROSTAGLANDIN F<sub>2</sub> ALPHA AND SYNTOCINON AS OXYTOCICS FOR INDUCTION OF LABOUR

by

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## Introduction

Intravenous oxytocin and/or artificial rupture of membranes are the standard methods of inducing labour.

Goldblatt (1935) and Von Euler (1936) observed that a substance extracted from the human seminal fluid (later named Prostaglandin) caused contraction of the smooth muscles. It is only in the recent years that its action of stimulating the uterine muscles has been made use of in the induction of abortions (Roth-Brandel and Adens, 1970; Bygdeman *et al*, 1971; Wiquist *et al*, 1972; Hingorani and Ganesh, 1972). Prostaglandin F<sub>2</sub> alpha was used for the first time by Karim *et al* in 1969 for induction of labour. Since then other trials with PGE<sub>1</sub> and PGE<sub>2</sub> have been carried out by Embrey (1970), and Beazley and Gillespie (1971). PGF<sub>2</sub>

alpha has also recently been tried for induction of labour by Anderson *et al* (1972). Various routes have been tried— intravenous, oral (Karim, 1971) and vaginal (Karim, 1971); of which the intravenous route is one of the most commonly used. PGF<sub>2</sub> alpha by the intravenous route has been used in the present study on account of its easy availability.

## Material and Method

Sixty-eight patients requiring induction of labour were included in the present study. Every alternate patient was given intravenous PGF<sub>2</sub> alpha or syntocinon. Of the 34 patients in each group, 17 had artificial rupture of membranes before PGF<sub>2</sub> or oxytocic drip was started (Table I).

The dose schedule was as follows— PGF<sub>2</sub> alpha was given in the strength of 2.5 mg/500 c.c. of 5% glucose. The drip was started at the rate of 8 drops/min (1.25 µg). It was increased by 4 drops every half an hour till labour pains were well established.

Syntocinon was given in the strength of 2 units/500 c.c. of 5% glucose. The drip was started at the rate of 8 drops/min (2 mU). It was increased by 4 drops every half an hour till labour pains were well established.

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TABLE I  
Distribution of Patients in Relation to Method of Induction

	Method of Induction			
	PGF <sub>2</sub> Alpha		Syntocinon	
	With ARM	Without ARM	With ARM	Without ARM
No. of cases	17	17	17	17
Total	34		34	

In both groups, in case a tetanic uterine contraction occurred, the rate of the drip was reduced and then readjusted after proper monitoring of the various parameters.

The schedule was to start the drip in the morning and if the labour pains started it was continued in most cases till delivery. If labour was not well established by 10 p.m. of the same day the drip was discontinued and restarted after a night's rest. Each day was considered as one attempt. In patients who required re-

peated attempts the induction delivery interval was calculated from the time the drip was started at the last attempt.

The foetal heart sounds, uterine contractions, progress of labour and the colour of the liquor were recorded every half an hour. Adequate hydration and nutrition were maintained throughout labour.

#### Results

Tables II and III shows that cases in both the groups were evenly matched for

TABLE II  
Age, Parity and Gestation

	PGF <sub>2</sub> Alpha			Syntocinon		
	With ARM	Without ARM	Average	With ARM	Without ARM	Average
Mean age in years	28	25.4	26.7	25.5	27.2	26.3
Range in years	21-35	21-36	21-36	21-35	18-35	18-35
Mean parity	1.5	0.8	1.2	1.3	0.8	1.5
Range	0-3	0-4	0-4	0-7	0-4	0-7
Mean gestation in weeks	39.5	38.5	39	38.6	39.9	39.2
Range in weeks	36-42	37-42	36-42	34-42	37-43	34-43

TABLE III  
Distribution of Patients in Relation to Bishop's Score and Method of Induction

Bishop's Score	Number of patients in relation to method of induction					
	PGF <sub>2</sub> Alpha			Syntocinon		
	With ARM	Without ARM	Total	With ARM	Without ARM	Total
0-4	2	2	4	2	3	5
5-8	14	15	29	13	14	27
9-13	1	0	1	2	0	2

age, parity, gestation and Bishop's Scoring.

All patients had a definite indication for induction of labour. Table IV shows that postdated pregnancy was the commonest indication followed by P.E.T. premature rupture of membranes and bad obstetric history in that order.

Table V shows that of the 34 patients

very interval were slightly shorter in the PGF<sub>2</sub> alpha group as compared to the syntocinon group, but the differences were not statistically significant.

Table VII shows the mode of delivery in both groups. More patients in the syntocinon group required caesarean section as compared to the PGF<sub>2</sub> alpha group

TABLE IV  
Indications for Induction of Labour

Indication	Number of patients	
	PGF <sub>2</sub> Alpha	Syntocinon
Postdated pregnancy (Beyond 41 weeks)	9	9
Pre-eclamptic toxæmia	9	5
Premature rupture of membranes	5	8
Bad obstetric history	5	4
Rh. incompatibility	5	2
Intra-uterine death	2	1
Others	4	5

TABLE V  
Distribution of Patients in Relation to Number of Attempts and Method of Induction

Method of Induction		Number of attempts			
		First	Second	Third	No Response
PGF <sub>2</sub> ALPHA	With ARM	17	0	0	0
	Without ARM	16	1	0	0
	Total	33	1	0	0
SYNTOCINON	With ARM	14	2	0	0
	Without ARM	10	5	1	2
	Total	24	7	1	2

induced with PGF<sub>2</sub> alpha, 33 patients responded in the 1st attempt and the only remaining patient responded in the 2nd attempt. Whereas in the patients induced with syntocinon, only 24 responded in the 1st attempt and 2 did not respond at all. This difference in the number of attempts required for induction of labour is statistically significant  $P < 0.05$ .

Table VI shows that mean induction onset of labour and mean induction deli-

but this difference was not statistically significant.

The complications in both groups were almost similar. Foetal distress and maternal exhaustion being the commonest. Tetanic contractions as well as vomiting and diarrhoea were not more common in the PGF<sub>2</sub> alpha group (Table VIII).

The birth weight of babies in both groups were not significantly different. The Apgar's Score was good in babies in

TABLE VI  
Induction Onset of Labour Interval and Induction Delivery Interval

	PGF <sub>2</sub> ALPHA			SYNTOCINON		
	With ARM	Without ARM	Average	With ARM	Without ARM	Average
	Mean induction/onset of labour interval in mins.	70.6 ± 17.9	149.8 ± 23.0	107.6 ± 35.1	140.7 ± 35.1	174.2 ± 36.6
Range in mins.	2 — 285	10 — 280	2 — 285	30 — 510	30 — 400	30 — 510
Mean induction delivery interval in mins.	585.7 ± 119.8	894.7 ± 152.2	740.2 ± 99.4	1001.2 ± 517.6	978.2 ± 175.5	991.1 ± 107.0
Range in mins.	155 — 1940	485 — 2300	155 — 2300	375 — 2080	455 — 2375	375 — 2375

TABLE VII  
Distribution of Patients in Relation to Mode of Delivery and Method of Induction

Mode of Delivery	Method of Induction					
	PGF <sub>2</sub> ALPHA			SYNTOCINON		
	With ARM	Without ARM	Total	With ARM	Without ARM	Total
Spontaneous						
Vaginal Delivery	13	12	25	10	10	20
Forceps	3	1	4	1	4	5
Vacuum extraction	0	2	2	1	0	1
Assisted breech delivery	0	0	0	2	0	2
L.S.C.S.	2	1	3	2	4	6

TABLE VIII  
Complications in Relation to Method of Induction

Complications	PGF <sub>2</sub> Alpha		Total	SYNTOCINON		
	With ARM	Without ARM		With ARM	Without ARM	Total
Foetal distress	3	1	4	3	2	5
Maternal exhaustion	3	3	6	2	3	5
Tetanic contraction	1	1	2	1	1	2
Atonic PPH	1	0	1	0	0	0
Cervical tear	0	0	0	1	0	1
Vomiting	1	0	1	0	1	1
Manual removal of placenta	0	0	0	1	1	2
III° Perineal tear	0	0	0	1	1	2

TABLE IX  
Birth Weight and Apgar's Score in Relation to Method of Induction

	Method of Induction					
	PGF <sub>2</sub> ALPHA			SYNTOCINON		
	With ARM	Without ARM	Average	With ARM	Without ARM	Average
Mean birth weight in Kg.	3.1	2.7	2.9	2.4	2.9	2.6
Range in Kg.	2.5-4	2.3-7	2-4	1.9-3.7	2.2-3.9	1.9-3.7
Mean Apgar Score	9/10	9/10	9/10	9/10	9/10	9/10

both groups excepting in one case where fresh stillbirth occurred in the syntocinon group due to shoulder dystocia.

#### Discussion

The present study shows that the mean induction onset of labour interval and induction delivery interval in the two groups of patients induced with PGF<sub>2</sub> alpha and syntocinon were not statistically different. The finding is in confirmation with that of other authors like Karim *et al* (1971), Anderson *et al* (1972), and Sherman and Vakhariya (1972). However, Sherman and Vakhariya (1972) in their study had slight indication of Prostaglandins being more effective in the difficult induction. In the present study it is clearly brought out that the number of attempts

required for a successful induction are definitely less with PGF<sub>2</sub> alpha as compared to those with syntocinon. The difference being statistically significant ( $P < 0.05$ ). Roth-Brandel and Adens (1970), Moghissi *et al* (1972) and Spelacy and Gall (1972) noticed occurrence of uterine hypertonicity leading to foetal distress necessitating caesarean section. In the present study few patients who had slightly prolonged uterine contraction could easily be reverted back to normal contractions by readjusting the drip rate. None of the patients developed foetal distress because of uterine hypertonicity requiring caesarean section.

Maternal complications like phlebitis, nausea and vomiting were not seen in any of the patients in the present study.

**Summary**

Labour was induced in 68 patients with 34 patients in each group, one receiving PGF<sub>2</sub> alpha and other syntocinon drip. This study indicates that PGF<sub>2</sub> alpha given intravenously is as safe and efficacious as syntocinon for induction of labour at term. It seems to be more effective than syntocinon in that the number of attempts required for successful induction were much less with PGF<sub>2</sub> alpha as compared to those with syntocinon. Further work needs to be done to substantiate this claim.

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