A COMPARATIVE STUDY OF VAGINAL PROSTAGLANDIN E2 PESSARIES WITH INTRAVENOUS OXYTOCIN FOR THE INDUCTION OF LABOUR AFTER SPONTANEOUS RUPTURE OF MEMBRANES

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ABSTRACT:

In a prospective randomized study, 60 patients were induced with 3 mg vaginal FE2 pesseries or intravenous oxytocin.

Oxytocin stimulation was associated with shorter labour and a lower incidence of abnormal cervimeteric progress, after spontaneous rupture of membranes. Out of these patients given PGE2 20% required a second dose after four hours of slow progress. 10% of primigravida subsequently developed abnormal labour and required augmentation by oxytocin to correct their uterine contractions. Two caesarian sections were carried out for disproportion and remaining 58 patients were delivered vaginally. PGE2 pesseries were not associated with an increased incidence of hyperstimulation or sepsis. In conclusion oxytocin infusion is a safe, effective but inconvenient method of induction of labour, while PGE2 pesseries are safe, effective, more acceptable but an expensive method of induction of labour.

METHOD AND COLLECTION OF PATIENTS.

All patients admitted to the labour ward at a gestation of more than 34 weeks who were not in labour within four hours of SROM were entered into the study.

Patients with multiple pregnancy, breech presentation, previous antepartum haemorrhage or caesarian section were excluded. The diagnosis of SROM was confirmed by sterile speculum examination. The cervix was examined digitally to exclude cord prolapse, and the change in Bishop Score was calculated (Calder 1974).

A cervical nomogram was drawn once the cervix was fully effaced and more than cm dilated. All labours were monitored continuously.

Stimulation was started when the membranes had been ruptured for more than four hours. The mode of stimulation was randomly allocated on the time of admission.

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One group received intravenous oxytocin (syntocinon) using a standard regimen of incremental doses until uterine activity was judged to be effective (4 i.u. of oxytocin in 1 litre of 5% Dextrose, starting at 2m -i.u. per minute and increasing to a maximum of 32 m - i.u. per minute.)

The other group had a 3 mg vaginal PGE2 pessary inserted into the posterior fornix. The pessary was repeated after 4 hours if there was no cervical change. If the patient was not in the active phase of labour after a further 4 hours, (modified Bishop score of 11 or more), intravenous oxytocin was started using the regimen already described. Oxytocin was also used in this group if there was slow progress in the active phase of labour, i.e. if the rate of cervical dilatation fell 2 hours behind the cervical nomogram, after exclusion of malpresentation, foetal abnormality and gross disproportion.

Characteristics of patients with spontaneous rupture of membranes.

	PRIMIGRAVIDAE		**MULTIGRAVIDAE**	
	PGE2	OXYTOCIN	PGE2	OXYTOCIN
Total Number	18	14	8	20
Age (years)	18-38	17-29	19-40	24-41
Weight (cm)	151-174	147-168	163-166	152-171
Gestation (weeks)	35-40	34-42	34-37	36-40
Gestation < 37 weeks	5	7	6	7
SROM - Stimulation interval (hr)	7.4	10.1	6.8	6.9
Bishop Score before stimulation	328	327	226	127

BACTERIOLOGY

Low vaginal swabs, vaginally obtained amniotic fluid and a mid-stream specimen of urine were collected on admission for microscopy and culture.

After delivery, swabs taken from the baby (Eye, ear, nose, throat, umbilicus and gastric aspirate) and a piece of placenta were sent for culture.

Maternal pyrexia of more than 37.5 C. in the puerperium was recorded and investigated by further cultures. Neonatal infections were noted, and such problems as jaundice and diarrhoea recorded.

INVESTIGATIONS.

Blood	Hb, Group, RBS, VDRL
Urine	Complete Macro and Microscopic examination
Vaginal Swab Sonography	Low Vaginal Swab for culture and sensitivity
Sonography	Complete foetal and placental assessment

PRIMIGRAVIDAE.

The 2 groups of primigravida were comparable. Those stimulated with oxytocin had on average shorter labour and a longer SROM-stimulation interval, but neither difference reached any significance. The mean Bishop Scores of the 2 groups were almost identical and there was no correlating between the duration of ruptured membranes and the Bishop Score on admission for either primigravidae or multigravidae. About 35% of mothers stimulated with PGE2, needed a second pessary after 4 hours because of slow progress. 40% of the patients were still not in the active phase of labour after 8 hours of stimulation and they required oxytocin. Two of them developed dysfunctional labour and required caesarian section which on subsequent pelvimetry showed small pelvic measurements. So as a matter of fact they had undiagnosed pelvic dysproportion.

Both the latent and active phases of the first stage and also the second stage of labour were shorter in the oxytocin group, but the difference was very small. The average duration of labour was 11.5 hours in the PGE2 group and 9 hours in the oxytocin group respectively.

Apart from the two cesarean section, the modes of delivery were similar. Apgar Scores were also comparable in both the groups. There was no intrapartum or puerperal pyrexia. Six infants in PGE2 group and four in the oxytocin group developed jaundice, but none of them required phototherapy. One baby in each group developed sticky eyes and needed antibiotics locally.

Details of labour and delivery.

	PRIMIGRAVIDAE		**MULTIGRAVIDAE**	
	PGE2	Oxytocin	PGE2	Oxytocin
Duration of labour Latent phase (hr)	0.7-15.3	0.3-10.0	4.0-8.3	0.2-13.5
Active phase (hr)	1.8-6.5	1.5-8.5	0.7-4.3	0.5-5.3
First stage (hr)	3.0-17.1	1.8-18.5	7.7-12.6	0.7-18.8
Total duration of labour (hr)	4.0-17.7	1.9-18.5	4.9-12.9	0.8-16.9
Dysfunctional labour Prolonged latent phase	4	3	0	5
Primary dysfunctional labour	5	3	0	0
Secondary arrest of dilatation	2	4	0	2
Analgesia Pethidine	15	9	6	14
Anfenax	10	8	0	6
Mode of delivery Spontaneous	12	10	8	20
Instrumental	5	3	0	0
Caesarian section	1	1	0	0
Birth Weight (Kg)	2.5-3.3	2.2-3.2	2.5-3.2	2.6-3.9

MULTIGRAVIDAE

The results were almost similar in this group. About 15% required a second dose of PGE2

pessary in the prostaglandin group, but subsequently all labored well. In the oxytocin group about 12% had a latent phase longer than 8 hours, but the mean duration of latent phase was still shorter in the PGE2 group.

All the patients were delivered normally. Four babies in the oxytocin group had low Apgar score at one minute, but they were related to pethidine analgesia. No mother developed intrapartum or puerperal pyrexia, and none of the babies became infected. Four babies in the PGE2 group and six in the oxytocin group became jaundiced, but none of them required phototherapy.

Bacteriology results.	PGE2 GROUP		OXYTOCIN GROUP	
Specimen obtained	Pus Cells only	Organisms grown	Pus Cells only	Organisms grown
On admission				
Low vaginal swab	12	2	4	7
Amniotic fluid	2	4	8	4
Mid-stream urine	8	0	6	0
At delivery Placenta	6	4	0	6
Neonatal Swabs	0	0	2	6
Gastric aspirate	6	4	8	4

RESULTS.

See tables please.

DISCUSSION.

Stimulation of labour after spontaneous rupture of the membranes with PGE2 vaginal pessaries are comparable with intravenous oxytocin. There were no failed inductions, and only two of the sixty women required cesarean section. The latent phase of labour was shorter after oxytocin stimulation by an average of 1.4 hours, sporting the experience of Lange et al. (1981) with oral PGE2 tablets. The total duration of labour was also shorter after oxytocin, specially in primigravidae (8.8 hours compared with 11.5 hours). This is in contrast to the findings of Hauth et al. (1977) who also used PGE2 tablets, but in their study women stimulated with oxytocin had labours twice as long in hours. There were no details of their oxytocin regimen, so perhaps they were using suboptimal doses.

Of the patients given PGE2 pessaries 35% needed a repeat dose after four hours of slow progress, and 40% of primigravidae were later augmented with oxytocin for dysfunctional labour.

The relatively high bacterial isolation rales from amniotic fluid and the vagina on admission support the idea that infection plays an important role in the genesis of SROM (Evaldson et al. 1982) Patients stimulated with PGE2 pessaries did not have a higher incidence of either positive cultures or clinical sepsis.

An interesting finding is that the duration of ruptured membranes in these non-laboring patients, did not correlate with the state of cervix on admission. Furthermore, there was no relation between the cervical Bishop Score and the duration of stimulated labour. This meant that patients with more prolonged membranes rupture did not have more favorable cervices on admission and did not labour faster than those patients who were admitted and stimulated early. This suggests that the despite rupture of membranes, cervical change does not occur until uterine contractions develop and labour becomes established.

PGE2 has been tried in induction of labour without SROM and compared with oxytocin induction by various workers in the past, having achieved comparable results in both groups. We believe that although the numbers in our study are small but we have compared, and intensively investigated them. We feel justified in making our conclusions, although further work and study is necessary to substantiate them.

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