

PRETERM INDUCED LABOUR—INFLUENCE OF
PREMATURE RUPTURE OF MEMBRANES ON CERVICOGRAPH*

By

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SUMMARY

Preterm labour induced by syntocinon for PROM in 30 cases is compared with preterm labour induced for other indications in 30 cases and term labour induced for PROM in 30 cases. Latent phase was 7.17 ± 4.26 hours in preterm compared to 4.27 ± 2.03 hours in term. With PROM all phases of cervical dilatation were prolonged in preterm. Significantly active phase was also prolonged in both multiparae and nulliparae in preterm induced for PROM. Total induction delivery interval was 6.50 ± 1.86 at term with PROM in nulliparae compared to 12.65 ± 5.7 at term with PROM and 8.61 ± 5.5 hours at preterm induced by ARM and syntocinon for other indications.

Introduction

Premature rupture of membranes is one of the commonest concomitant complication of preterm labour constituting about 35 to 37% of all deliveries. Preterm spontaneous labour as well as induced labour is often associated with obstetric complications like toxæmia of pregnancy or antepartum haemorrhage. Whatever the etiology of premature rupture of membranes its influence on subsequent labour is controversial. Van Pragt and Hendrick (1964) like Calkin (1952) and Bishop (1955) earlier found favourable effect—i.e. frequency of contraction and rate of cervical dilatation

was increased with premature rupture of membranes.

Material and Methods

Labour was induced by oxytocin drip given by titration method as described by Turnbull and Anderson's (1968) doubling the rate every half an hour till 3 contractions per 10 minutes were maintained. Thirty preterm (Group B) and 30 term (Group C) cases were induced for PROM and 30 preterm (A) had amniotomy followed by oxytocin for other indications. There were 15 nulliparae in Group A and group C and 9 in group B. Progress in labour was recorded graphically.

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Observation

Preterm compared to term labour (Table I): Induction—delivery interval.

TABLE I

Phases of Cervicograph and Stages of Induced Labour Comparing Preterm with Term Labour (Stages & Phases in Hours) Max. Slope in Cm/Hr.

Phase and Stages	Term Induced Labour (Group C) n= 30	Preterm induced Labour (Group (A + B) n = 60	Significance
Latent phase	4.27 ± 2.03	7.17 ± 4.26	NS
Active phase	3.73 ± 2.08	4.44 ± 1.96	NS
Acceleration phase	1.09 ± 0.64	1.38 ± 1.05	NS
Maximum slope	2.086 ± 1.56	2.27 ± 0.94	S
I stage	5.50 ± 3.06	8.56 ± 4.41	S
II stage	0.49 ± 0.33	0.55 ± 0.41	NS
III stage	0.13 ± 0.05	0.01 ± 0.03	NS
IDI	8.38 ± 3.66	11.80 ± 5.76	S

The duration of mean induction delivery interval in induced preterm labour was 11.80 hours as compared to 8.38 hours in term induced labour, the difference being significant statistically ($p < 0.01$).

Latent phase: The duration of latent phase in preterm labour lasted for 7.17 hours as compared to 4.27 hours in term labour. This difference was highly significant statistically ($p < 0.001$).

Active phase : Significant difference ($p < 0.05$) was found in maximum slope during active phase; the slope being 2.86 cm per hour in term labour as compared to 2.27 cm per hour in preterm labour.

Second and third stage: Duration of second and third stage was longer in preterm labour than in term labour but difference was not significant statistically.

Influence of premature rupture of membranes on preterm induced labour

Table II shows that the duration of all phases of cervicograph was shorter in preterm labour with intact membranes than in preterm with premature rupture of membranes. Statistically significant difference was found in latent phase and active phase duration. Maximum slope during active phase was 1.14 cms per hour with intact membranes and 1.70 cm per hour with ruptured membranes—the difference was not significant.

Cervicograph in preterm with or without PROM

In preterm primiparae (Table III) significantly active phase was longer

TABLE II

Mean Phases of Cervicograph in Induced Labour Comparing Preterm with Premature Rupture of Membranes (Group B) and Preterm with Intact Membranes (Group A).

Phases	Group A	Group B	Significance
Latent phase	6.14 ± 3.56	8.11 ± 5.40	S
Active phase	3.68 ± 1.66	5.11 ± 1.78	S
Acceleration phase	1.14 ± 0.66	1.70 ± 1.28	NS
Maximum slope	2.3 ± 1.05	2.10 ± 0.79	NS

TABLE III

Phases of Cervical Dilatation in Hours in Primiparae in Induced Preterm and Term Labour

Phase	Preterm intact (A) membranes No. 15	Preterm PROM (B) No. 9	Term PROM (C) No. 15
1. Latent phase	7.91 ± 3.70	10.55 ± 4.40	5.36 ± 2.07
2. Active phase	3.96 ± 1.42	5.41 ± 1.46	5.10 ± 2.19
3. Acceleration phase	1.32 ± 0.60	1.69 ± 1.19	1.35 ± 0.67
4. Maximum slope	2.26 ± 0.98	1.88 ± 0.8	2.60 ± 1.04
5. IDI	12.35 ± 4.77	16.65 ± 4.77	10.55 ± 3.97

Difference between A & B 2 significant

" " B C 1, 5 highly significant.

where labour was induced for PROM, being 5.41 ± 1.46 hours than 3.96 ± 1.42 hours in preterm induced for other indications (Group A) (Fig. 1).

In multiparae (Table IV) latent phase, active phase, acceleration phase and total induction delivery interval were significantly prolonged in PROM group than in preterm induced otherwise (group A).

Comparison of preterm with PROM versus term with PROM (Table III and IV)

In preterm primiparae with PROM latent phase was double that in term

with PROM being 10.55 ± 4.40 hours versus 5.36 ± 2.07 hours. The difference was statistically highly significant. Significant difference was also found in total induction delivery interval. Active phase was longer in preterm but not significant.

In multiparae preterm with PROM all phases were prolonged the difference from term with PROM was highly significant—latent phase being 7.35 hours compared to 3.18 hour in term, active phase being 5.09 hours compared to 2.96 hours in term. Rate of dilatation during maximum phase was 2.26 cm per hour in preterm and 3.02 cm/hour in term and

TABLE IV

Phases of Cervicograph in Induced Labour in Multiparae In Preterm with Intact Membranes (Group A), Preterm with Premature Rupture of Membranes (Group B) and Term with Premature Rupture of Membrane (Group C)

Phases	Group A n = 15	Group B n = 21	Group C n = 15
1. Latent phase	4.80 ± 3.69	7.35 ± 4.22	3.18 ± 1.32
2. Active phase	3.49 ± 2.13	5.09 ± 1.97	2.96 ± 1.32
3. Acceleration phase	0.86 ± 0.62	1.60 ± 1.30	0.81 ± 0.47
4. Maximum slope	2.64 ± 0.02	2.26 ± 0.90	3.02 ± 1.67
5. TIDI	8.61 ± 5.50	12.65 ± 5.70	6.50 ± 1.86

All phases in hours, max. slope in cm/hr.

Difference between A & B significant in 2, 3, 5.

" " B & C highly significant in 2, 2, 3, 5.

the difference was not significant statistically. Induction delivery interval was double that of term with PROM.

PROM. The differences being statistically significant.

With the same Bishop score 0-3; in preterm latent phase was double, 11.86 hours compared to 5.51 hours in term.

Labour phases in relation to initial Bishop score in PROM—preterm and term

The difference between the two groups

TABLE V

Phases of Cervical Dilatation in Induced Labour in Preterm with Prom (B) and Term with Prom (A) in Relation to Initial Bishop Score

Phase	Score Group No.	BISHOP SCORE				6 or more (Z)	
		0-3 (X)		3-6 Y		Group B n-7	Group C n-6
		Group B n-14	Group C n-10	Group B n-9	Group C n-14		
1. Latent phase	Mean	11.86	5.51	5.97	3.81	5.05	2.55
	SD	3.58	2.08	3.46	1.71	1.81	0.97
2. Active phase	Mean	6.26	6.14	4.44	2.90	3.70	2.16
	SD	1.31	1.61	1.47	1.03	1.25	0.26

Difference between X & Y, Y and Z significant in both groups.
 „ „ B & C groups, latent phase in X active phase in Y.

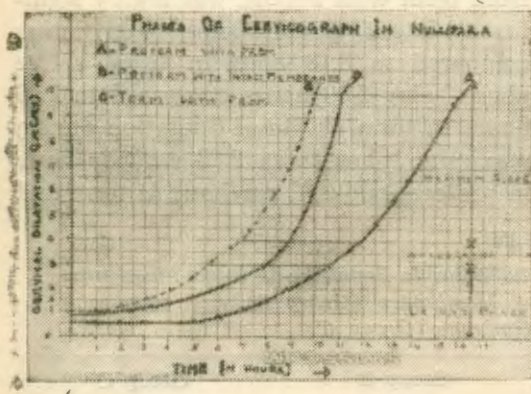


Fig. 1

In each group latent phase and active phase was significantly shorter if initial Bishop score was 4 or more than if it was 3 or less. Maximum slope was 1.82 ± 1.7 cm per hour with Bishop score 3 or less, 2.53 ± 1.9 with score 4-6, and 3.10 ± 0.35 with score 6 or more in preterm with

with PROM was not observed once the Bishop score increased above 6.

Acceleration phase and maximum slope was not significantly different between preterm with PROM and term with PROM.

Discussion

Underlying pathogenesis in preterm PROM is not understood. Degeneration of amniotic epithelial cells is considered as a cause for rupture of membranes at term (Bourne, 1962, King, 1975). Electron microscopy has revealed extensive degenerative changes in amniotic epithelial cells. It has been reported that plasminogen is fixed to damaged amniotic epithelial cells and this may have a role in premature rupture of membranes especially in preterm cases (Burgos *et al* 1982, Jenkin *et al* 1983).

Spontaneous preterm labour may be short but one expects a long latent period in induction of preterm cases. Latent phase, active phase and induction delivery interval were markedly prolonged in preterm induced labour compared to term induced labour where labour was induced only for PROM. Mean latent phase in preterm was double that of term with PROM. Friedman *et al* (1961) denied any consistent effect of PROM in abbreviating any of the phases of first stage of labour. In the present study, however, significant prolongation of latent and active phases was noted in multiparae preterm induced for PROM than in preterm induced for other indications. In PROM probably primary etiology is in chorio amniotic membranes while in other preterm cases with PET or APH placental insufficiency increases uterine reactivity. Differences are noted even with same initial Bishop scores.

Role of induction of labour in preterm complicated by PROM is controversial. Recently even in term cases with PROM benefits of induction have been questioned.

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