LATENCY PERIOD AS A CRITERION FOR INDUCIBILITY*

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SUMMARY

The Latency period i.e. the time taken for onset of 3 uterine contraction every 10 minutes after start of induction by amniotomy and oxytocin infusion is a valuable parameter for predicting the response in terms of progressive cervical dilatation. Less than 2 hour latency period suggests good prognosis for spontaneous vaginal delivery.

Introduction

Time taken for labour to be established since initiation of induction affects induction delivery interval, not only by virtue of its duration adding to total number of hours, but also by reflecting the quickness of uterine response to induction technique and hence the likelihood of success. Response to induction has been measured and compared often in terms of induction delivery interval, maximum oxytocin in milliunits per minute or total oxytocin dose required. Time taken for onset of labour i.e. "Latency period" is in turn affected by the preinduction cervical state. The graphic record of progressive cervical changes in terms of Bishop score is valuable as the 'Slope' of such graph is objectively comparable. Subsequent stages of labour or phases of cervical dilatation can be predicted by the slope (Vijaya and Mirchandani). Slope can be measured at end of Latent period, while Latency period can be measured earlier.

Material and Methods

Labour was induced by a combination of amniotomy and syntocinon infusion in 35 primiparae and 61 multiparae with period of gestation between 254-296 days. Bishop score at amniotomy was termed initial. It was 5 or less in 47% of cases.

The indication for induction was postdatism 40.62%, premature rupture of membranes 25%, toxaemia of pregnancy 21.8%, previous bad obstetric history 7.29%. Two units of syntocinon in 300 ml of 5% dextrose solute was given by titration i.e. rate increased every half an hour till 3 contractions of 45 seconds each occurred every 10 minutes (Turnbull and Anderson).

Latency period was the period from onset of induction to time of sustained 3 contractions per ten minutes.

** Part of Thesis accepted for M.D., Delhi University, 1983.*

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Accepted for publication on 20-7-85.

Inductography was plotted with progressive changes in Bishop score along abscissa and time in hours along ordinate. Slope of the inductograph was measured by ratio of perpendicular on the graph from a fixed point (Beazley and Alderman, 1976). Mean slope in this group was 1.02.

Observations

Relation with initial Bishop Score:

It can be inferred from Table I that the latency period is progressively shortened and optimal uterine activity commences progressively earlier, as the initial Bishop score rises (P less than 0.02). Mean latency period was less than 2 hours with initial Bishop score of 5 or more.

With initial score of 3 or less, it was always more than 2 hours. With initial score of 4, 53.44% and with 5 as high as 86.92% patient had started labour within 2.5 hour (Table II).

TABLE I

Mean Latency Period in Relation to the Initial Bishop Score

Initial Bishop Score	No. of patients	Latency period in hours		
		Mean	Range	S.D.
0-3	9	3.72	2.50-5.00	0.85
4	13	2.76	1.50-4.00	0.6
5	23	1.95	1.00-3.00	0.68
6	25	1.52	1.00-3.00	0.47
7	16	1.09	0.50-2.00	0.36
8	10	0.80	0.50-1.00	0.24

TABLE II

Latency Period in Hours in Relation to the 'Initial' Bishop Score

(Figures expressed as cumulative numbers and percentages)

'Initial' Bishop Score	No. of patients	Latency period in hours									
		0-0.5		0.5-1		1-1.5		1.5-2		2-2.5	
		No.	%	No.	%	No.	%	No.	%	No.	%
0-3	9	—	—	—	—	—	—	—	—	2	22.22
4	13	—	—	—	—	—	—	3	23.07	7	53.14
5	23	—	—	4	17.39	11	47.82	12	52.17	20	86.92
6	25	—	—	8	32	18	72	24	96	25	100
7	16	2	12.5	12	75	15	93.65	16	100	—	—
8	10	4	40	9	90	10	100	—	—	—	—

'Initial' Bishop Score	No. of patients	2.5-3		3-3.5		3.5-4		4-4.5		4.5-5	
		No.	%	No.	%	No.	%	No.	%	No.	%
0-3	9	2	22.22	5	55.55	6	66.66	7	77.77	9	100
4	13	10	76.92	12	92.30	13	100	—	—	—	—
5	23	23	100	—	—	—	—	—	—	—	—
6	25	—	—	—	—	—	—	—	—	—	—
7	16	—	—	—	—	—	—	—	—	—	—
8	10	—	—	—	—	—	—	—	—	—	—

$r = -0.21$ $t = 2.11$ $(N = (96-2) = 94)$.

With same initial score Bishop score response varies in terms of slope of inductograph and mean latency period (Table III). Latency period of 2.5 hours was associated with slope of more than I even with initial score 3 or less, while it was 2.2 hours with Bishop score of 4.

Correlation with slope of inductograph

Mean latency period was less than 2 hours in cases with slope of inductograph more than I. With slope 1.00-1.25 per hour mean latency period was 1.57 hours (Table IV).

Mode of Delivery: With slope of inductograph one or above chances of vaginal delivery are 100% (Table V).

Discussion

As early as in 1941 Calkins pointed out that two principle factors need to be considered in the process of labour, the motive force provided almost exclusively by uterine contractions and the resistence offered

TABLE III

Latency Period in Hours in Relation to the Slope of Inductograph and 'Initial' Bishop Score

'Initial' Bishop Score	Slope of inductograph	No. of patients	Latency period (hrs) Mean ± S.D.
0-3	<1.00	8	3.87 ± 0.78
	>1.00	1	2.50
4	<1.00	8	3.12 ± 0.48
	>1.00	5	2.20 ± 0.24
5	<1.00	11	2.65 ± 0.22
	>1.00	12	1.37 ± 0.29
6	<1.00	2	2.50 ± 0.50
	>1.00	23	1.15 ± 0.27
7	<1.00	2	1.53 ± 0.37
	>1.00	14	1.00 ± 0.26
8	<1.00	0	—
	>1.00	10	0.80 ± 0.24

Minimal t = 3.87
n = 14

TABLE IV

Mean Latency Period in Hours in Relation to the Slope of Inductograph

Slope of inductograph	Number of patients	Latency period in hours		
		Mean	S.D.	Range
<0.50	2	4.25	—	—
0.50-0.75	17	3.20	0.74	2.00-5.00
0.75-1.00	12	2.58	0.57	1.50-4.00
1.00-1.25	34	1.57	0.45	1.00-2.50
1.25-1.50	18	1.16	0.29	1.00-2.00
1.50-1.75	10	0.85	0.38	0.50-1.50
1.75-2.00	3	0.50	—	—
Total	96	1.85	—	0.50-5.00

Minimal t = 2.52 n = 26.

TABLE V
Mode of Delivery in Relation to the Slope Inductograph
(Figures Expressed as Percentage)

Slope of inductograph per hour	No. of patients	Type of delivery		
		Spontaneous Vaginal	Forceps	LSCS
Less than 0.05	2	0	50	50
0.05-0.75	17	58.82	29.41	11.76
0.75-1.00	12	100.0	—	—
1.00-1.25	34	100.0	—	—
1.25-1.50	18	94.44	5.55	—
1.50-1.75	10	100		—
1.75-2.00	3	100		

chiefly by the cervix. Same principle applies to induction of labour. Bishop's 1964 score considers cervical state. Smythe's (1958) oxytocin sensitivity test aims at predicting myometrial action. In induced labour with cephalopelvic disproportion excluded, oxytocin by titration in addition to amniotomy, average induction delivery interval was 7.7 hours, with 88.54% of patients delivered within 12 hours in present study even though 36.5% (35 out of 96) were primiparae and initial Bishop score was 4 or less in 25%. There were no major complications and caesarean section rate was only 3.0%. All cases were above 38 weeks gestation.

An analysis of the response to oxytocin after initial amniotomy in these cases suggested that slope of inductograph is a useful parameter for comparison of the response and may predict the type of cervical reactivity during active phase. The "Latency period" i.e. the time taken by the cohort to achieve 3 contractions of about 45 seconds each, every 10 minutes reflects the time taken to achieve the state of optimal uterine activity. It measures myometrial response in terms of hours after onset of induction. These exists a negative correlation between the preinduction Bishop score and the duration of latency period, 100% of cohorts with a score of 7 having established labour within 2 hours as compared to only 23.07% when the score was 4 (P less than 0.05).

Lange *et al* (1982) suggested latency period as a measure of inducibility. Latent phase is the chief variable in induced labour and recorded as inductograph, it is a linear graph the slope of which can be measured. All patients with a slope of 1.25 per hour or above had a latency period of less than 2 hours compared to only 5.88% with the slope 0.5-0.75 per hour (p less than 0.05).

Beazley and Alderman (1976) suggested that 80% of 'low risk' cases have slope of 1.10 per hour or more. Present study also confirms that spontaneous vaginal delivery was obtained with slope of inductograph 1.00 or above.

Slope of inductograph 1.00-1.25 was obtained with mean latency period 1.57 ± 0.45—hence it is suggested that criterion for inducibility should be taken as steady state of 3 contraction of 45 sec each per ten minutes obtained with 2 hours of onset of induction by amniotomy and oxytocin infusion by titration.

This response can be independent of initial Bishop score as seen in Table (III).

Acknowledgement

We are grateful to Principal and Medical Superintendent Dr. P. V. Gulati for permitting to publish the above data and we are also grateful to all residents staff and patients of Lady Hardinge Medical College and Smt. S. K. Hospital, New Delhi for co-operating for the above study.

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