

PATTERN OF CERVICAL DILATATION IN NORMAL LABOUR

By

PRALHAD KUSHTAGI, G. I. DHALL AND K. DHALL

SUMMARY

The pattern of cervical dilatation during labour in parturients at Chandigarh was determined following a prospective partographic study of 100 normal labours. The mean duration of active phase was 8.52 hours in nulliparas and 5.81 hours in multiparas ($p < 0.01$). The mean rate of cervical dilatation was 1.23 cm/hour in nulliparas and 1.86 cm/hour in multiparas, without terminal deceleration as full dilatation of cervix was reached. Booked patients showed reduction in the durations of latent and active phases. The station of foetal head and cervical dilatation at admission significantly affected the course of labour.

Introduction

Early diagnosis of disordered labour requires ongoing assessment of every labour in progress by graphic means. Determination of cervical dilatation is the most readily available means and when properly employed may be of inestimable aid in elucidating the problem of proper management of the parturient. Cervical dilatation time curves during labour in American women have been described by Friedman and Henricks. The practical value of these curves used as an alert and action line in the recognition of abnormal labour in conjunction with Philpott's partogram has been reported by Studd *et al.* Because of the reported differences in the rates of cervical dilatation in patients of different parity and ethnic groups, Lim *et al*

caution that it remains uncertain, whether such warning guidelines as described by various authors can be universally employed.

The present prospective partographic study has been carried out to determine the pattern of cervical dilatation in normal nulliparas and multiparas at Chandigarh situated in North West India.

Material and Methods

Normal labour was defined as one in which a normal patient with live singleton foetus with cephalic presentation started labour spontaneously between 37 to 41 weeks of gestation. She was not given conduction anaesthesia or oxytocic drugs and was delivered normally.

Normal patient was defined as one aged between 18 to 30 years, minimum 140 cm tall, with haemoglobin of at least 10 gm/dl, without scar on the uterus and without any detectable medical or surgical disorders complicating pregnancy.

From: Department of Obstetrics and Gynaecology, Postgraduate Institute of Medical Education and Research, Chandigarh-160 012.

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Cases with parity more than four, cervical dilatation more than 5 cm at admission and those with cephalopelvic disproportion were excluded.

The diagnosis of established labour was based on the findings of regular, progressive and painful uterine contractions, with or without show or leaking membranes and was confirmed by abdominal and vaginal examinations. The patients were thus admitted with different degrees of cervical dilatation.

These criteria were satisfied in 100 women and this study describes the characteristics of these labours.

The time of admission to labour ward was taken as 'zero' hour. Low amniotomy was performed, if membranes had not spontaneously ruptured by the time 4 cm cervical dilatation was achieved. Vaginal examinations were performed at 2 to 4 hourly intervals until delivery to record on the designed composite partogram, the cervical dilatation (in cm) and the level of the foetal head in relation to ischial spines (in cm).

The onset of second stage of labour was confirmed by vaginal examination which was performed when the cervicograph predicted the time of full dilatation, or when a patient was beginning to bear down or in some instances when the foetal head was already visible at the introitus.

To simplify the mathematical analysis the cervicograph was dissected into its component segments as described by Kalyanikutty and Rajagopalan. Student t-test was used to find the significance of differences between two averages.

Results

Of 100 cases, there were 71 nulliparas and 29 multiparas with an average age of 23.97 years and period of gestation of 39.09 weeks. None of the patients registered were short statured, overweight or anaemic. The average weight of the babies born was 2919.63 gm (Table I).

TABLE I
Characteristics of Parturients

Characteristics	Mean value
Age (Years)	23.97
Gestation (Weeks)	39.09
Height (cm)	156.66
Weight (kg)	61.06
Haemoglobin (gm/dl)	11.21
Infant weight (gm)	2919.63

Of the total number of cases the percentage of booked nulliparas and multiparas were 70.42 and 65.52, respectively. Table II gives the cervical findings in patients belonging to both the groups at the time of admission.

TABLE II
Clinical Findings at Admission in Labour

Clinical findings	Group I Nullipara (71)	Group II Multipara (29)
Ripe cervix* (per cent)	83.10	72.41
Mean cervical dilatation (cm)	2.57	3.31
Engaged foetal head (per cent)	16.90	3.45
Occipito-posterior position of foetal head (per cent)	30.98	27.59

* Ripe cervix = \geq 50% effaced.

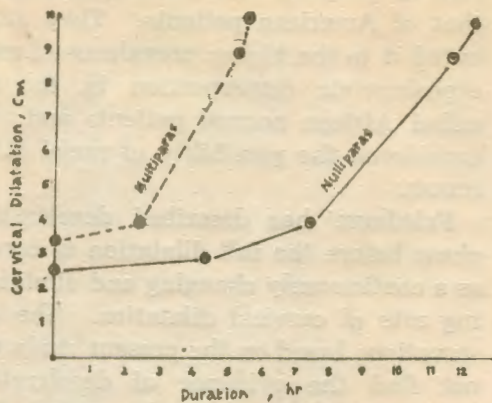


Fig. 1. Pattern of Cervical Dilatation with elapsed time in labour (Latent phase is excluded from the curve for multiparas)

The cervicographic data (Table III, Fig. 1) shows that multiparous women have shorter labour when compared to nulliparas in all the phases of labour and the differences were statistically significant except for the duration of latent phase

Various factors like maternal age, height, weight, haemoglobin status, foetal position, infant weight, social class and patients background—whether urban or rural, did not influence the progress of labour significantly. Apparent reduction in the duration of latent and active

phase was observed in booked patients, which however, was not statistically significant. The station of foetal head and cervical dilatation at admission significantly affected the course of labour (Fig. 2). Nulliparous patients with lower foetal

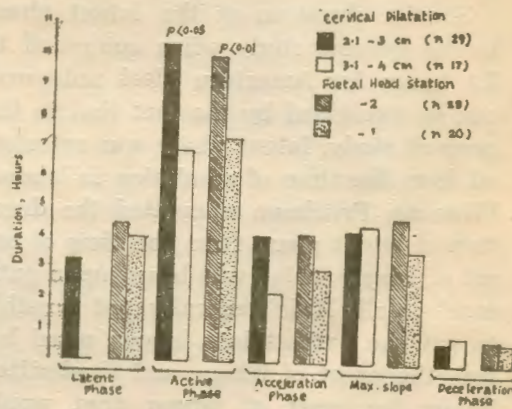


Fig. 2. Duration of various phases of Labour in relation to cervical dilatation and foetal head station at admission

tal head station (-1) showed shorter duration of active phase when compared to patients with -2 station at admission ($p < 0.01$). Shorter duration of active phase was observed in patients with cervical dilatation of 3-4 cm when compared to those with cervical dilatation of 2-3 cm ($p < 0.05$).

TABLE III
Cervicographic Data

Group	Admission delivery interval (hr)	Latent phase (hr)	Active phase (hr)	Acceleration phase (hr)	Maximum dilatation (cm/hr)	Deceleration phase (hr)
Nulliparas						
Mean	11.36	4.43	8.52	3.14	1.23	0.61
SD	5.74	3.46	4.65	2.64	0.66	0.49
Multiparas						
Mean	6.60***	6.25	5.81**	2.54	1.86***	0.28***
SD	4.43	6.89	3.55	1.99	0.98	0.18

SD = Standard Deviation. ** $p < 0.01$ *** $p < 0.001$.

Discussion

Friedman (1955) drew attention of obstetricians that labour as judged by cervical dilatation does not progress in a simple straight forward way throughout. Racial groups may differ in the progress of normal labour (Lim *et al*).

Shorter duration of the latent phase in the present study when compared to 7.1 hours for American ideal nulliparas can be explained by the fact that in the present study, latent phase was calculated from the time of admission in labour. Whereas, Friedman calculated the duration of latent phase from the time of onset of labour which was based upon patients' recall. It is generally not possible to get the patient into labour ward before the onset of labour and if admitted before the onset of labour that would bring in an element of artificiality from the point of view of management of labour. Hendricks *et al* felt that the duration of latent phase was of little concern. They also started the graph for monitoring labour from the time of admission.

The duration of active phase observed in the present study was longer when compared to American patients. This may be attributed to the apparently slower rate of cervical dilatation. Philpott and Castle¹² in a graphic analysis of Rhodesian primigravid labours found that the

rate of progress was 1.6 cm/hour—half that of American patients. They attributed it to the higher prevalence of mild cephalopelvic disproportion in the so-called African normal patients and also considered the possibility of racial differences.

Friedman⁴ has described deceleration phase before the full dilatation of cervix as a continuously changing and diminishing rate of cervical dilatation. The observations based on the present study did not find the evidence of deceleration phase. Hendricks *et al* also noted that cervical dilatation during active labour is a period of constant acceleration, rather than progression and that there is no deceleration phase in normal labour.

From Indian studies, wide variation in the mean rates of cervical dilatation during labour have been reported. Baracho *et al*¹ from Goa, in their 26 normal primigravida controls, noted the mean rate of dilatation of cervix as 1.35 cm/hour comparable to the rate obtained in the present study. Daftary and Mhatre² found the mean cervical dilatation rate as 1.61 cm/hour in their primigravida private patients at Bombay. Mittal and Rosario¹⁰ got the rate of 1.89 cm/hour for primigravidae in their study at Delhi. Khara *et al*⁸ observed the rate of cervical dilatation of 1.55 cm/hour in primigravida and 1.75 cm/hour in multiparas at Patna (Table IV).

TABLE IV
Rate of Cervical Dilatation
(Indian Studies)

Authors	Place	Nullipara		Multipara	
		No.	Cm/Hr.	No.	Cm/Hr.
Present study (1986)	Chandigarh	71	1.23	29	1.86
Khara <i>et al</i> 1984	Patna	50	1.55	50	1.75
Baracho <i>et al</i> 1984	Goa	26	1.35		
Mittal and Rosario 1981	Delhi	35	1.89		
Daftary and Mhatre 1973	Bombay	96	1.61		

Hence, it is considered important that in different regions of the country characteristics of normal labour should be defined because of possible regional variations. Once the duration and characteristics for normal labour in a particular community was defined, the assessment of progress of labour using partograms will help to predict most of abnormal labours. This will provide guidelines to the birth attendant working in villages, primary health centres, and in hospitals for timely referral and/or intervention.

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