

CERVICOGRAPHIC CHANGES IN PRIMIGRAVIDAE AFTER LABOUR ACTIVATION†

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Introduction

Important changes have occurred in the practice of obstetrics in recent years. The concept of passive supervision alone in being replaced by one of active management. Various methods have been described to assess the progress of labour, including sophisticated techniques like tocodynamography, electrohysterography, ultrasonography, cervicography etc. Of all these a cervicograph has a worldwide acceptance as an aid to the appraisal of normal and abnormal labour, because of its relative simplicity and earlier recognition of abnormal labour patterns.

The most important event occurring during labour is progressive cervical dilatation. By an extensive cervicographic study of normal nulliparous and multiparous labours, Friedman (1967) showed that the cervical dilatation followed a definite sigmoid curve, with two distinct phases. Friedman's mean nulliparous labour curve has been utilised as a standard for comparison.

Material and Method

It was a statistically designed experi-

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ment to determine the role of active management on the progress of primiparous labour by cervicographic analysis. Total 137 primigravide patients at term presenting sufficiently early in labour for adequate study were included. Patients with complications were excluded as were patients with more than 3 cm. dilatation.

Initial cervical effacement and dilatation were charted against 0 (Zero) time in a composite cervicograph along the ordinate. Subsequent progress of cervical dilatation was determined by a 2 hourly rectal examination at the peak of a contraction. Readings were recorded on a graph against the time in hours and a curve was obtained.

The course of labour was augmented artificially from the time of admission by amniotomy and syntocinon infusion of 5 units per litre at a rate of 20-40 drops per minute, either alone or in combination. A graphico-statistical cervicometric analysis of each labour was done and compared with a series of 35 patients acting as control (Group I).

Observations

Table I shows different phases of cervicograph in the control group. Computer analysis of their cervicographic patterns shows a curve more or less comparable with Friedman's curve with an average mean duration of labour of 14.16 hrs. Total cervical dilatation took 13.33 hrs.

TABLE I
Different phases in the control group

Phases	Mean	Mode	Median	S.D.	Stat. Limit	S.Em.	Range
Total (Hrs.)	14.16	13.00	13.00	4.305	22.77	0.74	28.33-8.66
1st Stage (Hrs.)	13.33	12.00	12.00	4.203	21.70	0.73	26.50-8.00
Latent Phase (Hrs.)	9.25	6.00	8.87	3.277	15.81	0.57	20.00-5.00
Active Phase (Hrs.)	4.00	3.00	3.70	1.361	6.73	0.25	7.00-2.00
Acceleration Phase (Hrs.)	0.56	0.33	0.33	0.403	1.37	0.07	3.00-1.00
Phase of Maximum Slope (cm/hr.)	1.89	2.00	2.00	0.494	2.88	0.03	2.00-0.16
Deceleration Phase (Hrs.)	0.32	0.16	0.25	0.261	0.85	0.05	1.00-0.08

1. S.D. = Standard deviation = $E \sqrt{d^2/N}$
2. Stat. Limit = Statistical limit
3. S. EM. = Standard error of mean = $\sqrt{SD/N}$

with a latent phase of approximately twice the duration of active phase and rate of dilatation during the phase of maximum slope was 1.89 cm/hr.

Similar cervicographs were plotted after amniotomy alone in 31 patients (study group IIA), after syntocinon infusion alone in 32 patients (study group IIB) and after combined artificial rupture of membranes and syntocinon infusion in 39 patients (study group IIC).

Table II depicts the effect of active management on duration of the latent phase. There was a marked reduction in the total duration of latent phase after labour activation. From a mean duration of 9.25 hrs. in the control group the latent phase decreased to 2.79 hrs. after artificial

rupture or membranes (30% of control and to 3.76 hrs. after syntocinon infusion (35% of control). After combined augmentation the latent phase duration was only 1.31 hrs. (15% of control).

Table III compares the role of different modes of activation on the active phase. The active phase duration in the control group was less than half of latent phase in the same group, being 4.00 hrs. and 9.25 hrs. respectively. After active management the durations were approximately equal. It was 2.75 hrs. after amniotomy, 2.05 hrs. after syntocinon infusion and only 1.29 hrs. after combined augmentation. Syntocinon infusion had more effect on the duration of active phase, while amniotomy alone reduced the latent

TABLE II
Effect of active management on the duration of latent phase (hrs.)

Group	Mean	Mode	Median	S.D.	State. Limit	S Em.	Range
I	9.25	6.00	8.87	3.277	15.81	0.51	22.00-5.00
IIA	2.79	2.00	2.00	2.062	6.91	0.37	6.00-0.50
IIB	3.76	2.00	3.75	1.494	6.78	0.26	6.00-1.50
IIC	1.31	0.66	1.00	1.020	3.31	0.16	4.00-0.00

TABLE III
Effect of active management on the duration of active phase (hrs.)

Group	Mean	Mode	Median	S. D.	Stat. Limit	S.Em	Range
I	4.00	3.00	3.70	1.361	6.73	0.23	7.00-2.00
IIA	2.75	2.00	2.33	1.795	6.34	0.32	9.00-0.83
IIB	2.05	1.50	1.79	1.107	4.27	0.19	7.33-0.50
IIC	1.29	2.00	1.33	0.545	2.39	0.08	2.25-0.25

phase duration more markedly.

A corresponding reduction also occurred in the durations of acceleration and deceleration phases (Fig. 1).

Table IV (Fig. 2) show the effect of active management on the rate of dilatation of cervix during the phase of maximum slope. Dilatation occurred at a

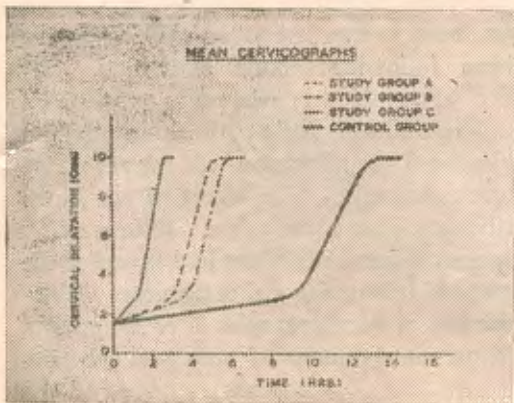


FIG. 1.

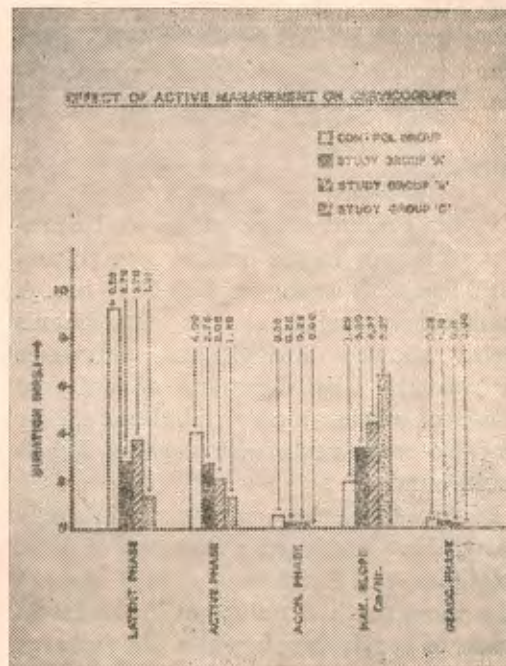


FIG. 2.

TABLE IV
Effect of Active Management on Phase of Maximum Slope (cm/hr.)

Group	Mean	Mode	Median	S. D.	Stat. Limit	S.Em.	Range
I	1.89	2.00	2.00	0.494	4.83	0.08	3.00-1.00
IIA	3.33	3.00	3.00	1.540	8.41	0.28	7.00-1.00
IIB	4.37	3.00	4.00	1.834	8.03	0.32	12.00-1.30
IIC	6.37	4.00	5.00	4.810	16.00	0.78	24.00-6.00

mean rate of 1.89 cm/hr. in the control group, this was hastened to 3.33 cm/hr. after amniotomy and 4.37 cm/hr. after syntocinon infusion. After combined activation dilatation occurred at a very fast rate of 6.37 cm/hr.

Total mean duration of labour was 5.93 hrs. after amniotomy (control 14.16 hrs.) with 74% delivering within 8 hrs. After syntocinon infusion it was 6.34 hrs. and 71% patients delivered in 8 hrs. After combined augmentation 79% delivered within 4 hrs. and total mean duration of labour was only 3.04 hrs.

Discussion

In the present series, mean total duration of labour in the control group was 14.16 hrs. with a range of 8.66-28.33 hrs. A statistical correlation with Friedman's series showed insignificant difference ($P > 0.02$). The durations of different phases of cervicograph as tabulated earlier are also comparable with those of Friedman's curve.

In present series, amniotomy in early latent phase produced a decrease of 60%. Friedman and Sachtleben (1963) observed a more marked reduction in the latent phase of cervicograph while the duration of active phase was not very significantly altered. Total first stage duration was 5.8 hrs. with amniotomy at cervical dilatation of 2 cm. (Friedman, 1967) while it was 5.5 hrs. in our series. This study shows a reduction of 30% in the duration of active phase and 70% in the latent phase as compared to the control group.

Daftary and Mhatre (1977) noted that rate of dilatation was faster at the end of latent phase following oxytocin infusion. In present series the duration of latent phase was 3.7 hrs. and that of the active phase was 2.05 hrs. with a maximum slope dilatation at a rate of 4.37 cm/hr.

After a combined augmentation with amniotomy and syntocinon infusion, a cumulative effect was observed on the cervicograph. Out of 39 patients 30 (79%) delivered within 4 hrs. Schaefer (1960) delivered 93.5% patients in 4 hrs. after a combined augmentation, as compared to only 9.6% in the control group. In the present series the mean duration of first stage was 2.61 hrs., 75% reduction compared with the control group. The latent phase was 1.31 hrs. and active phase 1.29 hrs. Dilatation occurred at a mean rate of 6.73 cm/hr. during the phase of maximum slope.

Conclusion

Cervical dilatation occurred at a rapid rate both in the latent as well as active phase following labour activation. The effect of amniotomy was more marked on the latent phase while syntocinon infusion influenced the duration of active phase more markedly. The effect of combined activation was cumulative. With a rapid cervical dilatation patient had to suffer the agony of labour for a shorter time. Maintenance of cervicographs is of great help during management of activated labour.

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References

1. Daftary, S. N. and Mhatre, P. N.: J. Obstet. Gynec. India. 27: 687, 1977.
2. Friedman, E. A.: and Sachtleben, M. R.: Obstet. Gynec 22: 487: 755, 1963.
3. Schaefer, G. Obstet. Gynec. 15: 465, 1960.