

ENGAGED/UNENGAGED HEAD IN PRIMIPARAE GETTING INTO LABOUR

(A Graphical Appraisal Utilizing Friedman Curve)

by

P. KALYANIKUTTY,* M.D., F.R.C.O.G., D.C.H.

and

C. K. RAJAGOPALAN,** D.G.O., M.D.

Various authors have studied the problem of unengaged head in primigravida exhaustively. Auer and Simmons (1969), Tamis and associate (1943) and Bhatt and Shirali (1961) are a few among them.

But it was Friedman (1954) who introduced a new approach in studying the course of the labour. He evaluated labours of five hundred primigravidae and introduced his graphical appraisal of labour and hence the new popular Friedman curve. He (1956) even devised a mechanical device (Cervimeter) to mensurate cervical dilatation. He again (1966) used the same approach in assessing the effect of station of the head on the course of labour.

Aim of the Study

The present study was taken up to evaluate the effect on the course of labour of engaged/unengaged head in a primigravida getting into labour, in whom disproportion has been ruled out, utilising Friedman's mean labour curve as the standard. It is the first of its kind in India.

*Director and Professor of Obst. & Gynec. Upgraded Department of Obst. & Gynec., Medical College, Trivandrum.

**Assistant Surgeon, E. S. I. Dispensary, Olarikkara, Trichur Dist.

Received for publication on 29-6-1972.

Material

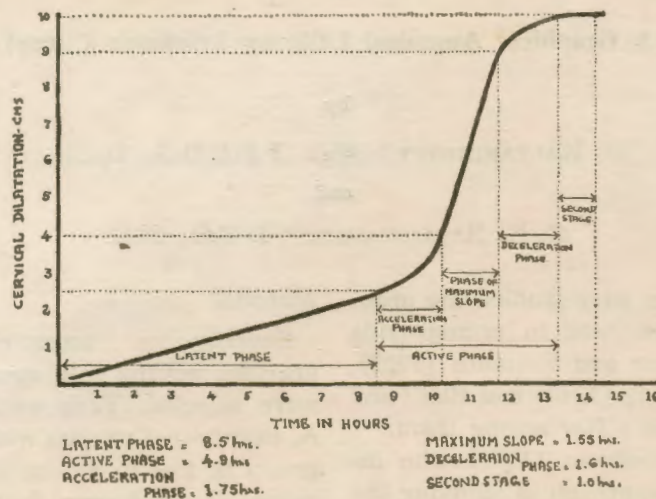
Seventy-five uncomplicated primigravidas getting into spontaneous labour were selected. They consisted of group A, twenty-five women with engaged head, group B, five in whom vertex was at or below—2 centimeter, but above O, and group C, twenty-five cases with vertex above—2 centimeter.

Method of selection of cases: As soon as the gravida was admitted to labour room a thorough general and obstetrical examination was carried out. She was given soap and water enema. Measurement of diagonal conjugate was done in the group of unengaged head. Only cases with diagonal conjugate of 11.5 cm or more were included in the study. The Muller-Kerr method of impression (Moir J. C. 1956) was used to rule out cephalopelvic disproportion. Frequent vaginal examinations were carried out, observing aseptic precautions to assess the station of the head and the degree of the cervical dilatation. Mean labour curve for each group was plotted as per Friedman.

Vertex at the level of the ischial spines was denoted as at station O and the distance above it was recorded as (Minus) —and below it as (Plus) +.

The following definitions were used in studying the various phases of first stage of labour (Figure I):

FIG. 1. MEAN LABOUR CURVE
(FRIEDMANN 1953)



Latent Phase: That phase of first stage of labour which commences at the onset of true labour pains and lasts until cervical dilatation of 2.5 cm.

Active Phase: The rest of first stage of labour.

Acceleration Phase: The phase extending from 2.5 cm dilatation of cervix to 4 cm dilatation.

Phase of Maximum Slope: Is the phase during which the cervical dilatation is greatest and starts at 4 cm. dilatation and ends up at 9 cm. dilatation.

Deceleration Phase: Is that portion of first stage of the labour occupied by the dilatation of the last 1 cm of cervix.

Friedman's Mean Labour Curve (Fig. II) was used as the standard to evaluate the results of the study.

Analysis of Cases

1. **Age:** This study was confined to primigravidae between the ages of seventeen years and twenty-five years. The range and mean of the age in each group is given in Table I.

2. **Latent Phase:** The latent phase of labour in each of the three groups is given in Table II.

Majority of parturients (68%) in Group A had a latent phase, 8 hours or less. In forty-four per cent of Group B,

Phases of 1st Stage of Labour

Latent Phase (Up to 2.5 cm)	Active Phase 2.5 cm-10 cm)
Acceleration Phase (2.5 cm-4 cm)	Deceleration Phase (9 cm-10 cm)
Phase of Maximum Slope (4 cm-9 cm)	

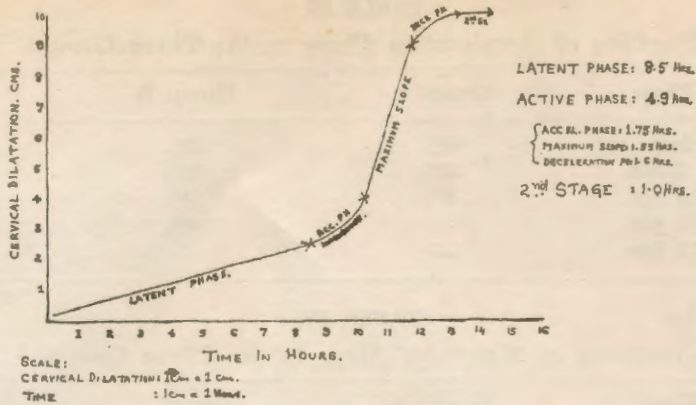


FIG. 2. FRIEDMAN'S MEAN LABOUR CURVE.

TABLE I
Range and Mean of Age

	Group A	Group B	Group C
Range	17-25 Yrs.	17-25 Yrs.	17-25 Yrs.
Mean	20.2 Yrs.	21.6 Yrs.	21.0 Yrs.

TABLE II
Duration of Latent Phase in the Three Groups

Latent Phase	A	B	C
8 Hours or less	68%	44%	—
> 8 hrs. — 10 hrs.	32%	24%	—
>10 hrs. — 12 hrs.	—	32%	—
>12 hrs. — 14 hrs.	—	—	12%
>14 hrs. — 16 hrs.	—	—	28%
>16 hrs. — 18 hrs.	—	—	28%
>18 hrs. — 20 hrs.	—	—	16%
>20 hrs. — 22 hrs.	—	—	12%
>22 hrs. — 24 hrs.	—	—	4%

latent phase was 8 hours or less and in the majority (68%) it was ten hours or less. The majority of parturients in Group C (28%) had a latent phase of more than 14 hours.

3. *Acceleration Phase:* The duration of acceleration phase is given in Table III.

The majority of parturients in Group A (92%) and Group B (68%) had an acceleration phase of two hours or less,

whereas only 48% of Group C had the acceleration phase of two hours or less. 52% of cases in Group C had acceleration phase of more than two hours.

4. *Maximum Slope:* Table IV shows the duration of maximum slope.

The maximum slope was 1.5 hours or less in the majority of Group A (64%) and Group B (52%) and in 36% of Group C. Majority of cases of Group C

TABLE III
Duration of Acceleration Phase in the Three Groups

Acceleration Phase	Group A	Group B	Group C
1.5 hrs. or less	40%	20%	—
>1.5 hrs. — 2 hrs.	52%	48%	48%
>2 hrs. — 2.5 hrs.	8%	24%	36%
>2.5 hrs. — 3 hrs.	—	8%	8%
> 3 hrs. — 3.5 hrs.	—	—	8%

TABLE IV
Duration of Maximum Slope in the Three Groups

Maximum Slope	Group A	Group B	Group C
1.5 hrs. or less	64%	52%	36%
1.5 hrs. — 2 hrs.	36%	36%	60%
2 hrs. — 2.5 hrs.	—	12%	4%

(60%) had a maximum slope between 1.5 hrs. to 2 hours.

In the majority of cases in Group A (68%), Group B (52%) and Group C (52%), the second stage of labour was one hour or less. Only in Group C was

5. *Deceleration Phase:* The length of deceleration phase is given in Table V.

one hour or less. Only in Group C was

TABLE V
Duration of Deceleration Phase in the Three Groups

Deceleration Phase	Group A	Group B	Group C
1.5 hrs. or less	100%	100%	92%
1.5 hrs. — 2 hrs.	—	—	8%

In all cases of Groups A and B, the deceleration phase was 1.5 hours or less and in almost all (92%) of cases of Group C also it was the same.

6. *Second Stage:* The duration of the second stage of labour is tabulated in Table VI.

there a single case with a second stage of labour of two hours, seven minutes. She was a nineteen years old primigravida who was delivered of a 3.6 Kg baby by forceps for failure of secondary powers. The mother and baby were well and discharged on the 8th day.

TABLE VI
Duration of the Second Stage

Second Stage	Group A	Group B	Group C
1 hr. or less	68%	52%	52%
1 hr. — 1.5 hrs.	16%	28%	24%
1.5 hrs. — 2 hrs.	16%	20%	20%
2 hrs. — 2.5 hrs.	—	—	4%

7. *Third Stage:* The third stage of labour was less than 10 minutes in all cases because of the active management of the third stage by intravenous injection of methergin and Brandt-Andrew Technique.

8. *Mode of Delivery:* (Table VII) There was one operative vaginal delivery

The incidence of prematurity according to international standard was 20 per cent in Group A and 12 per cent each in Groups B and C.

Discussion

The problem of high head in a primipara elicits two diametrically opposite

TABLE VII
Duration of the Third Stage

Mode of delivery	Group A	Group B	Group C
Spontaneous vaginal delivery	96%	96%	84%
Vacuum extraction	4%	—	8%
Low Midcavity forceps	—	4%	—
Outlet forceps	—	—	8%

in Group A. Vacuum extraction was resorted to in that 20 year old primigravida for foetal distress and a mildly asphyxiated baby (Apgar '6') of 2.6 Kg. weight was delivered. The baby was resuscitated by throat suction and oxygen. The baby was well at the time of discharge.

In Group C series there was one low mid-cavity forceps delivery for foetal distress. The baby was weighing 2.5 Kg and developed respiratory infection in the neonatal period and succumbed on the sixth day.

There were four cases of operative vaginal delivery in Group C. All were resorted to for failure of secondary powers. Two were outlet forceps and the other two were vacuum extractions. All the babies were well at the time of discharge.

9. *Baby Weight:* The weight distribution of the baby is given in Table VIII.

reactions—extremes in either case may be—suspicion elevated to apprehension on one hand, and the growing tendency of unconcern (Ian Donald 1969) on the other hand. With the introduction of the graphical method of appraisal of labour (Friedman 1954) a method for a simple, objective and more quantitative mode of study of this problem was available as compared to the function, qualitative and rough, appraisals hitherto-fore available and used.

The mean labour curve (Fig. II) the graph based on the careful study of 500 primigravida labours by Friedman at the Sloans Hospital gives an unusually clear picture of the course of the labour. And this was accepted as the standard in the present study.

Thus the majority of cases in Group A (72%) and 48% in Group B had a latent

TABLE VIII
Weight of the Baby

Weight of the baby	Group A	Group B	Group C
2.5 Kg and more	80%	88%	88%
Less than 2.5 Kg	20%	12%	12%

phase mean of the Friedman curve (Table IX).

This vividly brings out that a station of head of -2 cm. and below does not have any jeopardizing effect on the course of labour as far as the latent phase is concerned. The mean latent phase for Group A and Group B were 7.5 hours and 8 hours respectively (Figs. III and IV) which agree with the mean figure

given in Friedman.

The mean latent phase of group C (Fig. V) showed a 100% increase over the mean figure of Friedman. This protracted latent phase was hence the major effect of a high (above -2 cm.) station of head in a primipara getting into labour. This fact had been brought out by Friedman and Sachtleben (1965).

The acceleration phase was within the

TABLE IX
Latent Phase Mean of the Friedman Curve

Latent Phase as per M.L.C.	Group A	Group B	Group C
8.5 hrs. or less	72%	48%	—

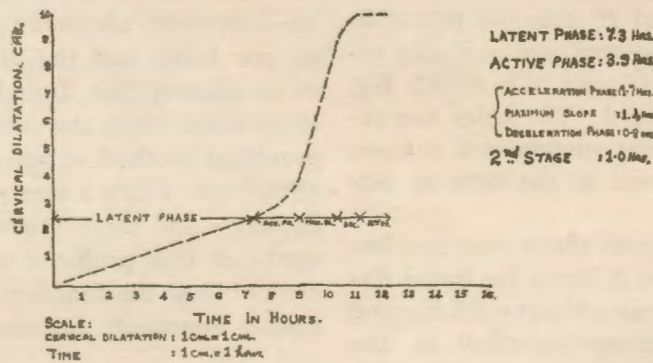


Fig. 3

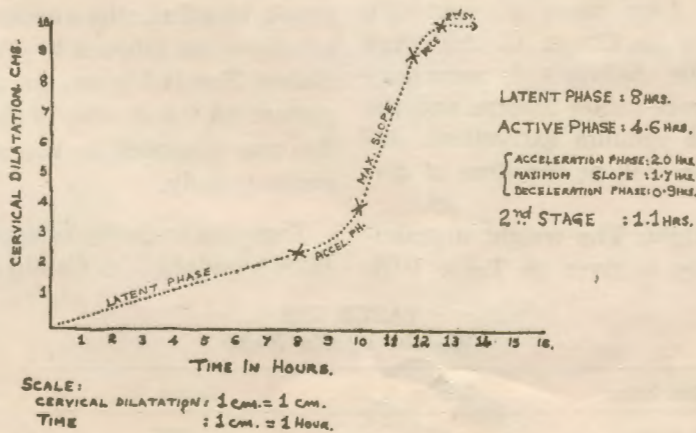


FIG. 4. MEAN LABOUR CURVE - GROUP B.

FIG. 3. MEAN LABOUR CURVE - GROUP A.

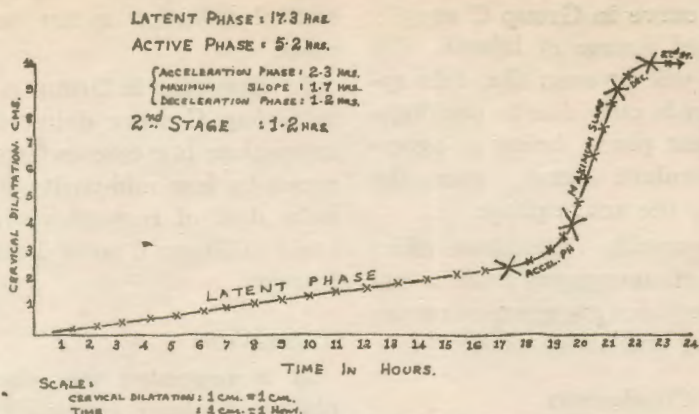


FIG. 5. MEAN LABOUR CURVE - GROUP C.

standard in 52% of Group A and 28% of Group B. The mean figure of Group A was within the standard figure and that of Group B showed only a 14% increase.

The mean figure for Group C showed a 31% increase over the standard. The reason for the increase is the high station which persists until the onset of the acceleration phase.

The maximum slope of 1.5 hours was in agreement with the figures of 1.4 hours, 1.7 hours and 1.7 hours respectively, of Groups A, B and C. This again is in agreement with Friedman and Sachtlen's (Loc-cit) observation that correc-

tion of the high station actually occurs towards the maximum slope of active phase and with that, duration of the labour is within normal limits.

The duration of deceleration phase was almost halved in cases of Groups A and B, whereas the figure was in agreement with the standard in Group C.

The duration of second stage in all the three groups was also in agreement with the standard.

A simultaneous study of the mean labour curves of the three groups with the Friedman curve (Fig. VI) shows a shift to the left of the curve in Group A, de-

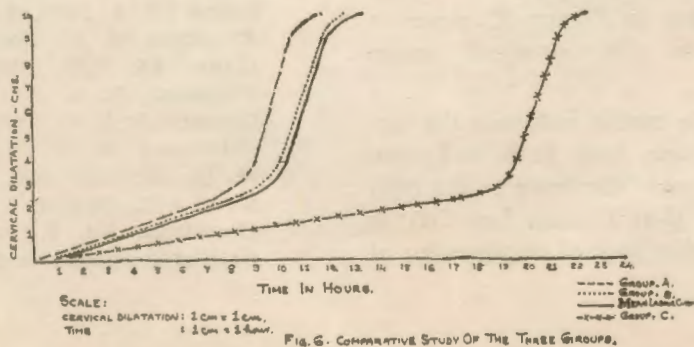


Fig. 6

noting quicker progress of labour with the head at -2 cm or below and a shift to the right of curve in Group C suggesting a protracted course of labour. On closer study it will be seen that this apparent tardiness is only due to prolongation of the latent phase, being in agreement with standard curve, once the labour enters in the active phase.

Thus the apparently deleterious effect on the labour of unengaged head is not irremediable, provided engagement occurs sometime during the active phase.

Summary and Conclusions

1. Seventy-five primigravida labours were appraised graphically.

2. These consisted of 25 cases with engaged head (Group A), 25 with -2 cm. station head (Group B) and 25 with above -2 cm. station of head.

3. Muller-Kerr method of impression was used to rule out cephalopelvic disproportion.

4. Only cases without disproportion and any complication were selected for the study.

5. The latent phase and acceleration phase were significantly increased in Group C cases. This might have been prevented by early resort to physiological oxytocin drug.

6. All phases in Group A and B and the other phases in Group C were in agreement with the standard mean labour curve.

Striking a via media between the apprehensive attitude Auer E. S. and associate (Loc-Cit) and "the hoots to the high head" attitude (Ian Donald Loc-Cit) it may be stated that lack of engagement of

the presenting part in a primigravida getting into labour although worthy of our critical attention is not necessarily ominous.

7. One case in Group A and two cases in Group C were delivered by vacuum extraction; one case in Group B was delivered by low mid-cavity forceps and the baby died of respiratory infection. Two cases in Group C were delivered by outlet forceps.

Suggestions

It is suggested that the study of the phases of labour utilising Friedman curve as a routine will help in detecting the tendency for tardy labour early, and prompt resort to physiological oxytocin drip may obviate an exhausting and protracted labour which ought to be the aim of modern obstetric practice. With this view, it is advocated that the Friedman mean labour curve is incorporated in labour room case sheets and students are taught to record their findings graphically.

References

1. Auer, E. S. and Simmons, J. M.: *Am. J. of Obst. & Gynec.* 58: 291, 1949.
2. Tamis, A. B. and Clahr, J.: *Am. J. of Obst. & Gynec.* 45: 39, 1943.
3. Bhatt, R. V. and Shirali, P. M.: *J. of Obst. & Gynec. of India*, 12: 83, 1961.
4. Donald, I: *Practical Obstetric Problems* Ed. 4, 1969. Lloyd-Luke Ltd.
5. Friedman, E. A.: *Am. J. of Obst. & Gynec.* 68: 1568, 1954.
6. Friedman, E. A.: *Am. J. of Obst. & Gynec.* 71: 1189, 1956.
7. Friedman, E. A. and Sachtleben, M. R.: 93: 522, 1965.
8. Moir, J. C.: *Munro Kerr's Operative Obstetrics*, Ed. 7. Page 338, 1964 Bailliere, Tindall & Co.