Influence of Partograph Tracing in Management of Labour in Primigravida

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Abstract
Background: The objective of this study was to improve perinatal outcome by early detection of abnormal progress of labour and prevention of prolonged labour.
Method: This study was carried out in 200 patients admitted in labour room of Department of Obstetrics and Gynaecology, G.R. Medical College, Gwalior within a total span of one year i.e. May 2016 to April 2017. The graphs of all patients were analyzed and placed in three groups. Group A patients who delivered before partogram touched the alert line. Group B patient who delivered when the partogram lay between the alert and action lines. Group C were patients who delivered after the action line was reached. The different types of abnormal labour were studied. The maternal and fetal outcome was assessed.
Results: In our study maximum number of patients are of 18-21 years of age group. Maximum number of patients were delivered normally i.e. 88% and instrumental delivery 3% and LSCS 9%. p value is 0.00001 i.e. significant and coefficient value is 41.42. 170 patients needed acceleration of labour out of this 18 patients were not improved and underwent LSCS. p value is significant.
Conclusion: A continuous partogram is invaluable in the diagnosis of abnormal uterine action. And while clinical judgment may decide the necessary for intervention, the partogram clearly defines the time to act. It significantly improves both maternal and neonatal outcome.
Keywords: Labour, partogram, alert line, action line.

Introduction
The partogram is a composite graphical record of key data (maternal and fetal) during labour entered against time on a single sheet of paper. Prolonged labour is associated with several adverse outcomes. It can lead to maternal exhaustion, maternal sepsis, obstructed labour, rupture uterus, postpartum haemorrhage, perinatal asphyxia, neoantal sepsis disability and can lead to still birth, neonatal death and even maternal death.¹,²,³ The concept of active management of labour was first implemented by O'Driscoll and colleagues at National Maternity Hospital in Dublin in 1968, the next step in active management of labour is to monitor closely the patients progress according to an institutional partogram. Emanuel A. Friedman (1954)'s extensive research on partogram in labour has laid
the basic foundation for further studies, establishing once and for all clearcut criteria for diagnosis of dysfunctional labour. The same is followed in modern day obstetrics with a little modification. Philpott in 1972 devised a composite labour picture and introduced the alert and action lines to partogram. The WHO partogram clearly differentiates the normal from the abnormal in labour and identifies those women likely to require intervention. Its use in labour ward is recommended. In our study we did graphic record of labour of primigravida patient to analyse the patterns of labour among them and to assist in early decision for intervention.

Material and Methods
In this study a detailed prospective workup of 200 patients admitted in Department of Obstetrics and Gynaecology, G.R. Medical College, Gwalior within a year from May 2016 to April 2017 was done.

Inclusion Criteria
- Only primigravida women aged 19-29 years who had crossed 37 weeks of gestation.
- Pregnancies without any significant medical and obstetric complications.
- Single live fetus in vertex presentation.
- Cases irrespective of either induced or spontaneous onset of labour were included on this study.
- Monitoring of progress of labour in the study were started from active phase of labour (4 cm or more of cervical dilatation)

Exclusion Criteria
- Multipara
- Teenage pregnancy
- Elderly primigravida
- Multiple pregnancies
- Malpresentation
- Post-caesarean pregnancy
- Preterm labour
- Severe oligohydramnios

Detailed history regarding age, parity, duration of pregnancy and labour pain was taken from every patient. Examination was done including general physical examination, abdominal examination for fundal height, lie, presentation, palpable uterine contraction and fetal heart rate. Pelvic examination was done for pelvic assessment and Bishop score. All the data were entered in a predesigned proforma. To nullify inter observer variations all the examinations to determine dilatation and station were done only by the author. Examinations were carried out four hourly throughout the duration of labour. However, modifications were made to account rapidly progressing labour, especially during the maximum slope of dilatation, wherein, examinations were done much more frequently. All the relevant findings were charted serially on a partogram and a continuous partogram was obtained. The partogram used in this study is the WHO partogram retaining the action line in the phase drawn. Individual partogram was studied to know the various aspects related to course of labour and role of partograph in influencing decision making in abnormal progress of labour was assessed. The graph of patients analysed and were placed in three categories:

1. Group A - Patients who delivered before the partogram touched the alert line.
2. Group B - Patient who delivered when the partogram lay between the alert and action lines.
3. Group C - Patients who delivered after the action line was reached.

The mode of delivery was ascertained and perinatal outcome analyzed by studying condition of baby at birth, Apgar score and neonatal response. Standard statistical test (chi square, analysis of variance etc) were used wherever applicable.

Results
Out of 200 primigravida patients 112(56%) belongs to 18-21 years of age group. 45 i.e. 22.5% belong to 22-25 years of age group. 43 i.e. 21.5% belongs to 26-29 years of age group. The
maximum number of patients belongs to 18-21 years of age group i.e. 112(56%).

Table 1: Age wise distribution of cases

| Age in years | No. of cases | Percentage |
|--------------|--------------|------------|
| 18-21        | 112          | 56         |
| 22-25        | 45           | 22.5       |
| 26-29        | 43           | 21.5       |
| Total        | 200          | 100        |

Table 2: Distribution of cases in relation to partogram

| Groups    | No. of cases | Percentage |
|-----------|--------------|------------|
| Group I   | 120          | 60         |
| Group II  | 41           | 29.5       |
| Group III | 39           | 19.5       |
| Total     | 200          | 100        |

Group I - Left to alert line, Group II - Right to alert line, Group III - Right to action line

The table shows that among 200 primigravida 120 women had normal cervimetric progress and were of left to alert line of partogram. 80 had abnormal cervimetric progress. Among them 41 were of right to alert line. 39 of them crossed the action line.

Table 3: Distribution of cases in which acceleration of labour needed

| Group | Methods of acceleration | No. | %      | No. | %      | No. | %      |
|-------|-------------------------|-----|--------|-----|--------|-----|--------|
|       | ARM                     |     |        | ARM +|        | Misoprostol |     |
| I     | 60                      | 66.66| 20     | 22.2| 10.    | 111.1 |
| II    | 12                      | 29.2 | 15     | 36.5| 14     | 34.14 |
| III   | 16                      | 41   | 12     | 30.7| 11     | 28.2  |

This table no. 3 shows that in group I out of 120 patients, 90 patients acceleration of labour. Acceleration of labour was done by artificial rupture of membrane in 60 cases. Artificial rupture of membrane with oxytocin in 20 cases, misoprostol drug in 10 cases. Group II, 41 of them had acceleartion with ARM, ARM with oxytocin and misoprostol 12, 15 and 14 patients respectively. In group III, 39 of them needed acceleration. Chi square value is 19.7 and p value is 0.00057 which is significant.

Table 4: Distribution of cases according to acceleration of labour needed or not

| Acceleration of labour | Group I | Group II | Group III |
|------------------------|---------|----------|-----------|
| Done                   | 90      | 41       | 39        |
| Not done               | 30      | 0        | 0         |

Above table shows that in group II and III all patients need acceleration of labour.

Table 5: Distribution of cases according to result of acceleration of labour

| Group     | Group I | Group II | Group III |
|-----------|---------|----------|-----------|
| No.       | %       | No.      | %         | No.      | %         |
| ARM       | 60      | 66.67    | 11        | 26.83    | 14        | 35.9      |
| ARM + Oxytocin | 19      | 21.11    | 14        | 34.15    | 6         | 15.38     |
| Misoprostol | 9       | 10       | 12        | 29.27    | 7         | 17.9      |
| Not impaired | 2      | 2.2      | 4         | 9.7      | 12        | 30.79     |

Above table shows that out of 90 patients in group I, 88 were improved with difference methods of acceleration of labour while 2 were not and underwent LSCS (2.2%). In group II, out of 41 patients 37 patients were improved with acceleration method and undergone normal delivery. 4 were not improved and got delivered by LSCS (9.7%). In group III, out of 39 patients 27 patients were improved and delivered normal vaginally and 12 patients were underwent LSCS (30.7%).

Table 6: Rate of cervical dilatation

| Group | Rate     |
|-------|----------|
| I     | 1.6 cm/hr|
| II    | 0.76 cm/hr|
| III   | 0.35 cm/hr|

Above table shows that the average rate of cervical dilatation in group I is 1.6 cm/hr which is more than group II and III.

Table 7: Distribution of cases according to mode of delivery

| Group | Mode of delivery | FTND | Forceps | LSCS | Total |
|-------|------------------|------|---------|------|-------|
| No.   | %                | No.  | %       | No.  | %     |
| I     | 118              | 98.3 | 0       | 1.6  | 120   |
| II    | 34               | 82.9 | 3       | 7.3  | 41    |
| III   | 24               | 61.5 | 3       | 37.5 | 39    |

In above table group I, out of 120 patients 118 (98.3%) were delivered normal vaginally, 2 cases...
underwent LSCS. In group II, among 41 cases 34 were delivered normally (82.9%), 3 of them were delivered normally (82.9%), 3 of them were delivered by ventouse (7.3%) and 4 were delivered by LSCS (9.7%). In group III, among 36 cases 24 were delivered normal vaginal (61.5%), 3 were by ventouse (7.6%) and 12 were by LSCS (30.7%). Maximum number of cases were delivered normally in group I as compared to other two groups. P value is significant (0.00001). Coefficient value $\chi^2 = 41.42$

**Table 8:** Distribution of cases according to indication of LSCS

| Indications                           | Groups | I         | II        | III       |
|--------------------------------------|--------|-----------|-----------|-----------|
| Fetal distress                       | No.    | %         | No.       | %         |
|                                       | 2      | 1.6       | 3         | 7.3       |
| Secondary arrest of cervical dilatation | 0     | 0         | 1         | 2.4       | 5         | 12.8   |
| Secondary arrest of descent          | 0      | 0         | 0         | 0         | 5         | 12.8   |

In the table in group I, II and III LSCS was done due to fetal distress in 2 cases, 3 cases and 2 cases respectively as compared to group III in which LSCS was done in 10 cases where indication were secondary arrest of cervical dilatation and descent.

**Table 9:** Apgar score in 1 minute

| Score | Group I | Group II | Group III |
|-------|---------|----------|-----------|
|       | No.     | %        | No.       | %         |
| 0-3   | 0       | 0        | 3         | 7.3       | 5         | 12.8   |
| 4-6   | 2       | 1.6      | 4         | 9.7       | 4         | 10.25  |
| >7    | 118     | 98.33    | 34        | 82.9      | 30        | 76.92  |

The above table shows that number of newborn with Apgar score in 1 min are 0-3 score. 0, 3 and 5 in group I, II and III respectively. 4-6 score in group I, II and III are 2, 4 and 4 respectively and > 7 score in group I, II and III are 118, 34 and 30 respectively. In this table significant association p<0.001 was found with $\chi^2 = 48.78$.

**Table 10:** Apgar score in 5 minutes

| Score | Group I | Group II | Group III |
|-------|---------|----------|-----------|
|       | No.     | %        | No.       | %         | No.      | %         |
| 0-3   | 0       | 0        | 3         | 7.3       | 5         | 12.8      |
| 4-6   | 2       | 1.6      | 4         | 9.7       | 4         | 10.25     |
| >7    | 118     | 98.33    | 34        | 82.9      | 30        | 76.92     |

This table shows that number of newborns with Apgar score in 5 min are group I, II, II are 0, 3 and 5 respectively. 4-6 score in group I, II, III are 2, 4, 3 respectively. 7-8 score in group I, II, III are 18, 12, 5 respectively. 9-10 score in group I, II, III are 100, 22, 2 respectively. That signified less number of newborn having low Apgar score in group I as compare to II and III.

**Table 11:** Distribution of cases according to maternal morbidity in various groups

| Indications   | Groups |
|---------------|--------|
|               | I      | II     | III    |
| Fever         | -      | 4      | 10     |
| Wound         | -      | 5      | 5      |
| Fistula       | -      | -      | -      |
| UTI           | 1      | 2      | 4      |
| Perineal tear | -      | -      | -      |

This table shows that only 1 patient in group I is having UTI in relation to 2 and 4 in group II and III.

Incidence of wound infection is seen in group II and III are 5, 5 respectively and fever is occur in 4 and 10 patients of group I and III.

**Discussion**

Although labour is a natural phenomenon leading to the child birth and most of them do occur spontaneously, a few tend to become dystonic and result in prolonged labour. Hence it is essential to identify the abnormality early and deliver them safely in time by appropriate intervention. In present study patients were divided in three groups in relation to alert and action line of WHO modified partogram.

**Table 11:** Distribution of patients according to partogram patients

| Partogram group | Philpott and Castle | Daferty and Mhatre | Diarra I | Present study |
|----------------|---------------------|--------------------|---------|---------------|
| I              | 77%                 | 66%                | 64%     | 60%           |
| II             | 11%                 | 25.5%              | 31.3%   | 20.5%         |
| III            | 11%                 | 8.5%               | 4.7%    | 19.5%         |
41 patients out of 200 were crossed alert line (20.5%). In Philpott study 1972\(^7\), 22% of patients crossed the alert line. In WHO (1994)\(^6\) study 34.5% patients crossed the alert line. In our study number of patients crossed the alert line is comparable to Philpott study.\(^7\) In our study 39 out of 200 patients crossed the action line (19.5%) in WHO study (1994)\(^6\) 9.9% patients crossed the action line. In Philpott's study\(^7\), 11 crossed the action line. Levender et al (2008)\(^10\) in their study reveal that 51.3% women were crossed the action line. In our study acceleration of labour was done artificial rupture of membrane, artificial rupture of membrane and oxytocin, misoprostol. Augmentation of labour in our study was done in 90 cases of 120 patients (75%) before the alert line with ARM 60 patients, ARM + oxytocin 19 patients, misoprostol 9 patients. Frigoletto et al\(^11\) study augmentation needed in 77% of cases. In a study by William Ledger and William Witting\(^12\) it was found that in group I incidence of acceleration of labour was 27% were as an group II and III incidence of labour was 72%. Out of us ARM done in 11 patients, ARM with oxytocin 14 patients and misoprostol in 12 patients. Caesarean section was done in 4 cases often alert line was crossed. Only 2 CS with done before alert line due to fetal distress. Out of 39 ARM done in 14. ARM with oxytocin in 6 and misoprostol in 5, 12 patients were not improved and underwent LSCS. LSCS. In Daftary and Mhatre\(^8\) study 68% patients had FTND. 14% required vacuum 7.5% underwent LSCS. In present study, 18 out of 2006 patients undergone LSCS (9%). Lopez Zeno et al (1962)\(^14\) In the present study, it was found that group II and III there were 5.5% of women who arrest the rate of cervical dilatation and descent. In the study Friedman\(^3\) and Sachleban 15% of women with secondary arrest of cervical dilatation Philpotts and Castle\(^7\) in their study also found higher incidence of CPD (>50% incidence of CPD) among women secondary arrest of descent and dilatation. In the study by AN Shrroti (1991)\(^15\) it was found to have a higher incidence of CPD and prolong II stage of labour. Dutta and Pal (1978)\(^16\) in their study found 6.3% incidence of secondary arrest of progression of obstetric labour. This study is comparable to our study. In this present study rate of cervical dilatation in group I is 1.6 cm/hr, in group II is 0.76 cm/hr and group III 0.35 cm/hr. Evans and Melmed H study (1979)\(^17\) studied the value of cervical dilatation rate measured in active phase. In 93% of women the initial rate of cervical dilatation was 1 cm/hr more delivered spontaneously and in 77% it was less than 1 cm and required assisted delivery. In present study 60% patient having rate of cervical dilatation > 1 cm and 40% having < 1 cm/hr. This is not comparable to our study. A study by Shinde et al\(^18\) rate of cervical dilatation in 73% of patients was 1.3 cm/hr comparable to our study. In the present study 91% of babies had apgar score 7-8 which is comparable to 88% by Goyal Latika et al\(^19\) 5% of babies had apgar score of 4-6 and 4% of babies with apgar score of 0-3. In the present study, maternal morbidity was evaluated in relation to the types of labour the morbidity was 1.5% in cases having normal labour pattern where it was 15% in cases with abnormal labour pattern. Our study is comparable to study Shinde et al\(^18\) where 3% cases having normal labour pattern and 50% of cases of abnormal labour pattern shows maternal morbidity. The average hospital stay in present study was 3-4 days which was comparable to study by Shinde et al\(^18\) 3.5 days.

### Table: Outcomes of Labour

| Outcome of Labour | Philpott and Castle series\(^7\) | Paffary and Mhatre\(^8\) | WHO \(^6\) | Lawrenc e Impye\(^13\) | Present study |
|-------------------|---------------------------------|-------------------------|------------|------------------------|--------------|
| FTND              | 89.85%                          | 68%                     | 78.3%      | 75.4%                  | 88%          |
| Vacuum            | 15.55%                          | 14%                     | 4.2%       | 19.2%                  | 3%           |
| Forceps           | -                               | -                       | 10.5%      | -                      | -            |
| LSCS              | 2.6%                            | 7.5%                    | 6.9%       | 5.4%                   | 9%           |

In our study, 118 (595) patients delivered by NVD before alert line and 64 (32%) delivered by normal vaginal delivery after alert line. The study of Frigoletto et al (1995)\(^11\) 78.3% vaginal delivery and 9.2% patients delivered by CS. In Philpott and Castle\(^7\) study, 78.85% had FTND, 15.55% required vacuum/forceps and 2.6% underwent
Conclusion

Although labour is a maternal phenomenon leading to child birth and normally majority of labour do occur spontaneously a few tend to become dystocia and go in for prolonged labour. Hence, identification abnormality is essential from this study and previous studies, it is evident that the routine use of partogram is helpful in detecting abnormalities in the progress of labour early corrective therapy. The key to early diagnosis and detection of disorders in labour progression specially by following the evolution of characteristics pattern of cervical dilatation and fetal descent, using the partogram has also helped in achieving the policy of active management of labour is ensuring the delivery of the patient within twelve hours. Besides the following advantages of the partogram have been noted:

1. It is an inexperience and simple beside clinical method.
2. It is efficient and time saving.
3. It is sensitive and specific.

Graphic record of labour increases the quality of regularly of observations on the mother and fetus provide early warning for the abnormal progress and assist in early decision for referral, intervention and termination of labour the safe motherhood initiative emphasize that the monitoring of labour for early detection of dystocia in the most important approaches for reducing maternal and neonatal mortality.

References

1. Ijjat Javed, Shereen Bhutta, Tabassum Shohaib. Role of partogram in preventing prolong labour. J Pak Med Assoc 2007 Aug;57(8):408-411.
2. Neilson JP, Lavender T, Quenby S. Obstructed labour reducing maternal death and disability during pregnancy. Br Med Bull 2003;67(1):191-204.
3. Surekha Tayade, Pooja Jadhao. The impact of use of modified who partography on maternal and perinatal outcome. IJBAR 2012;03(04):256-62.
4. Friedman E. The graphic analysis of labour. Am J Obstet Gynecol 1954;68:1568.
5. Philpott RH. Graphic records in labour. Br Med J 1972;4:163.
6. World Health Organization. Partograph in management of labour. World Health Organization Maternal Health and Safety Motherhood Program. Lancet 1994;343:1399-1403.
7. Philpott RH, Castle WM. Cervicographs in management of labour in primigravida. Br J Obstet and Gynecol1997;79:599.
8. Daftary S, Mhatre, DamaniaKR, Manju M. Partographic monitoring of labour using a normogram. J of Obstet and Gynecol of India 1992;41:611-615.
9. Diarra I, Camara S, Maiga MK. Assessment of use of partogram at the district maternity hospital of commune II in Bamako area. Mali Med 2010;25(2):36-34,93.
10. Lavender T, hart A, Smyth RM. Effect of partogram use on outcomes for women in spontaneous labour at term. Cochrane Database System Rev 2008;8:CD0005461.
11. Frigolette F, Lieberman E, Lang J. A clinical trial of active management of labour. N Eng J Med 1995;333:745-50.
12. William Francoise, Isabelle K. Effects of early augmentation of labour with amniotomy and oxytocin in nulliparous women. Br J Obstet and Gynaecol 1998;105: 189-194.
13. Lawrence Impey, Jonathan Hobson, Coln O' Herliby. Graphic analysis of actively managed labour: Prospective computation of labour progress in 500 consecutive nulliparous women in spontaneous labour at term. Am J of Obstet and Gynecol 2000;183:438-442.
14. Lopez Zeno J, Peaceman A, Adashek J. A controlled trial of a partogram for active management of labour. N Eng J Med 1992;326:430-4.
15. Shrroti A, Ray JJ. Influence of fetal station on cervimetric progress in primigravida. J Obstet Gynecol India 1994;44:388-89.

16. Dutta DC and Pal SK 1978; obstructed labour a review of 307 cases: J Obstet Gynecol India 1978 ;28: 55-58

17. Evans M, Melmed H. Predictive value of cervical dilatation rates. Primipara in labour. Obstet Gynecol 1976;47(5):571-575.

18. Kunal K. Shinde, Vidyahar B. Bangal, Rashmi K. Singh. Study of course of labour by modified who partograph. IJBAR 2012.

19. Goyal Latika, Kapoor M, Agarwal U, Agarwal AK. Partographic study of active management of labour on relation of foetal outcome. J of Obstet and Gynecol 1990;41:174-181.