

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20213835>

Original Research Article

## Partogram: an important tool in managing labour!

Swagatha Mukherjee<sup>1</sup>, Raksha M.<sup>2\*</sup>, Malini K. V.<sup>3</sup>

<sup>1</sup>Department of Obstetrics and Gynaecology, Siddhartha Medical College, Tumkur, Karnataka, India

<sup>2</sup>Department of Obstetrics and Gynaecology, BMCRI, Bangalore, Karnataka, India

<sup>3</sup>Department of Obstetrics and Gynaecology, SABVMC, Bangalore, Karnataka, India

**Received:** 08 September 2021

**Revised:** 19 September 2021

**Accepted:** 20 September 2021

**\*Correspondence:**

Dr. Raksha M.,

E-mail: [draksha.m@gmail.com](mailto:draksha.m@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Various types and designs of partographs are being used at various centers. WHO introduced simplified version of partogram, for the use by skilled birth attendant. Preprinted paper versions of the partograph are available

**Methods:** 100 antenatal women were selected for study. Patients with vertex presentation and singleton pregnancy were taken. Patients who came late in labour and those with cephalopelvic disproportion were not included in the study. Cervical Dilatation in cms was assessed by per vaginal examination every 2 hourly, fetal Heart Rate every ½ hourly, uterine contractions and maternal pulse measured every ½ hourly, maternal BP and temperature were measured every 4th hourly.

**Results:** Using WHO simplified partogram, characteristics of labour and neonatal outcome was evaluated. Among the 100 women included in the study, 78 required augmentation of labour, here 6 of them crossed the alert line and underwent LSCS. Of the 22 women who did not require augmentation, 4 crossed the alert line and underwent LSCS. We didn't find any difference in monitoring of labour using simplified version of WHO partogram compared with other partograms, apparently it's more simpler to plot and easy to understand.

**Conclusions:** An alert line on partogram should be based on lower 10th centile rate of cervical dilatation of the local population. We found this rate as 1cm/hr, which corresponds to the slope of alert line on standard partogram. Based on this we conclude, simplified partogram is good enough for monitoring labour progress.

**Keywords:** Simplified partogram, Alert line, Action line

### INTRODUCTION

It is said that of all the journeys we ever make the most dangerous one is the very first one, we take through the birth canal. Prolonged labour was known to be associated with maternal infection, obstructed labour, PPH, uterine rupture, which increase the maternal and perinatal morbidity and may end with mortality. It has been a common axiom "Not to allow sun to set twice on a labouring woman, in order to prevent such tragic events."<sup>1</sup>

Since 1954, when Friedman first reported the graphical representation of progress of labour, obstetric caregivers

have used the concept of partogram to aid intrapartum care. The partogram (sometimes known as partograph) is usually a pre- printed paper form, on which labour observations are recorded. The aim of partogram is to provide a pictorial overview of labour, to alert midwives and obstetricians to deviations in maternal or fetal wellbeing and labour progress.<sup>1,2</sup>

In the present age, the obstetrician as well as women in labour would prefer the delivery to be accomplished in shortest possible time, compatible with safety of mother and fetus. Hence, the hopeful expectancy replaced by an active management of labour. Partogram can be used as an

effective aid for this purpose. Partograph is an inexpensive, accessible managerial tool which has been endorsed by WHO for monitoring of labour.<sup>3</sup> Various types and designs of partographs are being used at various centers. WHO introduced simplified version of partogram, for the use by skilled birth attendant. Preprinted paper versions of the partograph are available.<sup>4</sup> In the absence of preprinted partographs, users have manually drawn key features of the cervicograph on blank paper and have successfully plotted progress of labour. Stencils with different cervical dilatation-time curves, constructed with reference to cervical dilatation on admission to the labour ward, as well as circular partographs and an electronic partograph have been used for labour monitoring.<sup>6</sup>

Before any rigorous evaluation, the availability of the simplified WHO partograph was considered an important advance in modern obstetrics that was applicable in all settings.

There were several reports of its usefulness from low and high resource settings. The majority of early studies took place in hospital settings.<sup>7-9</sup>

It was not until over 2 decades after Philpott's reports that a very large field trial of the partograph was conducted by the WHO to establish its effectiveness.<sup>10,11</sup>

The partograph used was the composite partograph (described earlier) based on the principles of Philpott's partograph.

## METHODS

The study was conducted in the department of obstetrics and gynecology at Sri Siddhartha Medical College and Research Centre, Tumkur among the women who fulfill the selection criteria.

The study was cross-sectional study. The sample size was 100 cases. The study was conducted from September 2012 to October 2013.

### Inclusion criteria

Both primi and multigravida, women in spontaneous labour, at term gestation (37-42 weeks), with a live singleton pregnancy and in vertex presentation

### Exclusion criteria

Women were excluded if they had significant medical disease, pregnancies complicated with fetal malformations, prolonged pregnancy, multiple pregnancy, malpresentation, cephalopelvic disproportion.

### Parameters to be studied

Cervical dilatation in cms assessed by per vaginal examination every 2 hourly, fetal Heart Rate every ½

hourly, uterine contractions assessed by per abdominal examination every ½ hourly, maternal pulse measured every ½ hourly, maternal BP and temperature measured every 4th hourly.

The partogram used in the study was simplified WHO partogram with only

cervicograph and with maternal and fetal parameters, though we didn't use its exact colour coded version.

### Plotting of simplified partograph (Figure 1)

Each small box on the partograph represents half an hour interval, initial finding of cervical dilatation has to be plotted on the alert line, time of p/v examination has to be written in the row marked for the time directly below the plotting of cervical dilatation. Monitoring of half hourly Foetal heart rate (·), number of uterine contractions, ½ hourly pulse rate (·), 4th hourly temperature, 4th hourly Blood pressure (↓), Cervical dilatation (x).

Statistical analysis was done using the statistical software GraphPad InStat. Descriptive statistics; chi-square test, Z test and contingency table analysis were carried out. Statistical significance was set at a p<0.05 with 95% confidence interval.

## RESULTS

In the present study 70% of the women were less than 25 years. Table 1 shows the age distribution in the present study.

**Table 1: Age distribution in the study population.**

Age in years	No. of patients	%
18-20	13	13
21-25	57	57
26-30	29	29
>30	1	1
<b>Total</b>	<b>100</b>	<b>100</b>

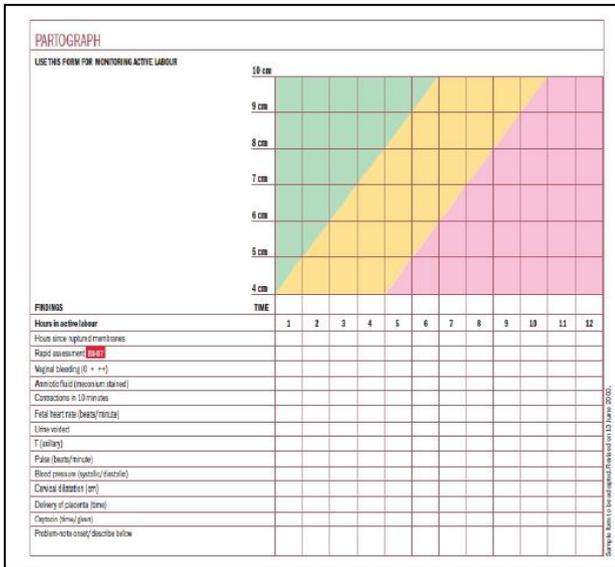
Figure 2 shows the gestational age distribution in the present study. As per the inclusion criteria, patient were selected with gestational age ranging from 36 to 42 weeks. Mean gestational age was 38.85 weeks. The mean total duration of labor for primigravida was 10.5 hours and that for multigravida was 5.2 hours as shown in figure 3.

**Table 2: Labour augmentation.**

Augmentation	No. of patients	%
<b>No augmentation done</b>	<b>21</b>	<b>21</b>
<b>Augmentation done ARM</b>	<b>7</b>	<b>7</b>
<b>Oxytocin</b>	<b>15</b>	<b>15</b>
<b>ARM+Oxytocin</b>	<b>57</b>	<b>57</b>
<b>Total</b>	<b>100</b>	<b>100</b>

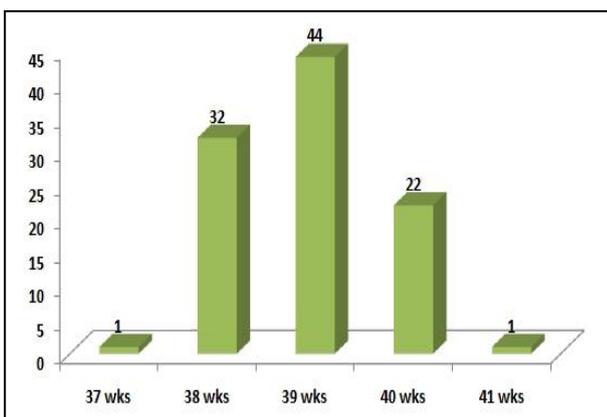
**Table 3: Group division of patients crossing alert and action line.**

Crossed alert line	Yes	No	Total
Augmentation	6	72	78
No augmentation	4	18	22
<b>Total</b>	<b>10</b>	<b>90</b>	<b>100</b>



**Figure 1: WHO simplified partogram.**

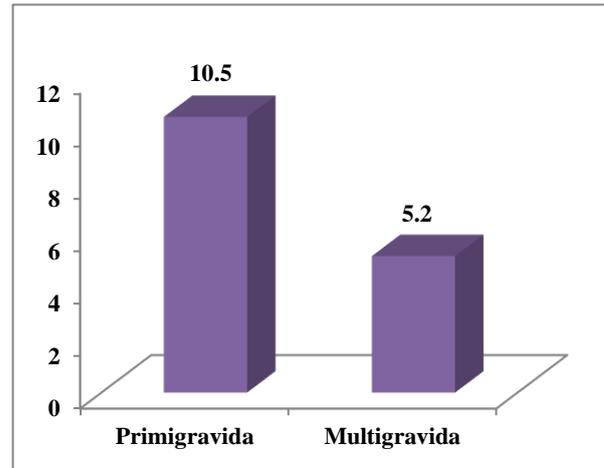
Table 2 shows that 21 patients (21%) delivered without any augmentation while in another 79. Patients (79%) labour augmentation was done. Of 79 patients, in 7,15 and 57 patients augmentation with ARM, oxytocin and ARM with oxytocin respectively. In present study augmentation of labour was done using amniotomy, oxytocin or both and was individualized based on uterine contractions.



**Figure 2: Gestational age in weeks.**

Out of 100 women, 13 (13%) patients crossed the alert line on partogram. Among the 13 patients 3 crossed the action line. 10 patients were in between the alert and action line. In Table 3 we can see group division of patients crossing alert and action line. All 13 patients who crossed the alert

line underwent LSCS. The remaining 87 patients delivered vaginally.



**Figure 3: Total duration of labour.**

**DISCUSSION**

Discussion on present study is done here as per the order of results.

**Age**

Age is an important factor in determining the obstetrical outcome. The mother's age can have an impact on pregnancy at both ends of the reproductive spectrum. Teenagers are more likely to be anemic, and they are at increased risk to have growth-restricted infants, preterm labor, and higher infant mortality while women older than 35 years of age, has significantly increased incidence of hypertension, diabetes, placenta previa and abruption, preterm delivery, and perinatal mortality.<sup>12</sup> The mean age found in the present study was 23.9 years which is favourable age (20-24 years) for conception with least pregnancy related complications.

**Gestational age**

The mean gestational age was 38.85 weeks. 80% patients delivery 2 weeks prior and 1 week following expected date of delivery.

**Total duration of labour**

Kilpatrick reported that the mean length of first- and second-stage labor was approximately 9 hours in nulliparous women without regional analgesia, and that the 95th percentile upper limit was 18.5 hour. Spontaneous labor was analyzed in nearly 25,000 women delivered at term at Parkland Hospital in the early 1990s. Almost 80 percent of women were admitted with a cervical dilatation of 5 cm or less. The median time from admission to spontaneous delivery for all parturients was 3.5 hours, and 95 percent of all women delivered within 10.1 hours.

Zhang et al described similar findings in their study of 126,887 deliveries from 12 institutions over the United States. These results suggest that normal human labour is relatively short. Our study too showed similar results, with total mean duration of labour being  $3.967 \pm 1.584$  hrs with the 95th percentile of all nulliparas delivered within 6.75hrs.

#### *Need for augmentation*

Augmentation refers to stimulation of spontaneous contraction that are considered inadequate because of failed cervical dilatation and fetal descent. Table shows the comparison between nulliparous women who required augmentation to women who didn't. P value was found significant for mean gestational age, duration of first and second stages of labour, for caesarean section and crossing the alert line on partogram. Other parameters like age, induction of labour, forceps delivery or NICU transfers of babies were not found related to augmentation of labour.

The mean gestational age in the group requiring augmentation was obviously higher, as ARM was being performed as a routine at cervical dilatation  $>4$  cm at gestational age  $>40$  weeks and also in cases where rate of cervical dilatation was less than 1cm/hr. Duration of first and second stage of labour was found significantly higher in augmentation requiring group as these patients had poor progress of labour compared with the other group. Oxytocin was used in cases where inadequate uterine contraction was detected, mostly in cases of PROM. ARM was used as a primary measure in cases with slow progress of labour, and oxytocin was added when the labour progress in terms of uterine contractions and cervical dilatation remained slow inspite of ARM. Following are the incidences quoted by different authors in primigravidas requiring active management of labour: Philpotts- 11%, O'Driscoll- 55%, present study- 60%.

The high incidence of active management in our study is due to the labour protocol followed in our study. There were 10 LSCS in augmentation requiring group, which means 90% of nulliparas improved with augmentation delivering vaginally.

#### *Alert line and action line*

As the labour slows down which can be easily observed over partogram, the alert and action lines on partogram are crossed.

The results of patients crossing alert line and action line are summarized in table no. A comparison between the women who remained left to alert line and who crossed alert line to come right of it is presented in table no. As expected, duration of labour will be significantly ( $p < 0.0001$ ) longer in patients crossing the alert line when compared to the other group who remains left of partogram. In our study, the duration of first stage of labour nearly doubled as the labour slowed down crossing

the alert line, though the duration of second stage of labour increased in women crossing the alert line but it was not very significant statistically ( $p = 0.0856$ ) compared to those who remaining on the left of alert line. This statistical insignificance could be due early identification of slow labours and initiation of intervention in form of augmentation, so as the labour progress improved leading to reduced duration and became comparable to those who remained left of alert line.

In 1992, Dujardin et al showed the value of alert line and action line in the partogram. The results showed the usefulness and efficacy of partogram and emphasized on the value of medical intervention as soon as the alert line is crossed.<sup>14</sup> In 1995, De Groof, Vangleender Huyson, Junker, (1995) did a study on the impact of introduction of partogram on maternal and perinatal mortality and morbidity and concluded that the introduction of partogram reduces the amount of the time in labour, thereby improving the follow up care the pregnant women receives.<sup>15</sup> Obviously the requirement of labour augmentation was significantly high once the labour crossed alert line. Requirement of labour augmentation has already been discussed under its heading. Regarding the mode of delivery, our study results were comparable to other studies showing high rates of operative intervention once the labour crossed alert line or action line.

In Philpotts series, the incidence of operative delivery was 1.2% in group I, 20.6% in group II and 72.8% in group III. Incidence of normal delivery in group I was 98%, in group II 79% and in group III 28% respectively.

The sample size of our study is only 100, this is a limitation of our study. More studies with a larger sample size would help in further strengthening the results of our study.

#### **CONCLUSION**

From our study, we realized the significance of alert line. An alert line on partogram should be based on lower 10th centile rate of cervical dilatation of the local population. We found this rate as 1cm/hr, which corresponds to the slope of alert line on standard partogram. Based on this we conclude, simplified partogram is good enough for monitoring labour progress of our local population.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

#### **REFERENCES**

1. Matthews M. The Partograph for the Prevention of Obstructed Labour. *Clinical obstetrics and gynecology.* 2009;52(2):256-69.
2. Friedman E. The graphic analysis of labor. *Am J Obstet Gynecol.* 1954;68:1568-5.

3. Lavender T, Hart A, Smyth RM. Effect of partogram use on outcomes for women in spontaneous labour at term. *Cochrane Database Syst Rev.* 2008;1-4.
4. Philpott RH, Castle WM. Cervicographs in the management of labour in primigravidae. The alert line for detecting abnormal labour. *J Obstet Gynaecol Br Commonw.* 1972;79:592-8.
5. Lavender T, Alfirevic Z, Walkinshaw S. Effect of different partogram action lines on birth outcomes: a randomized controlled trial. *Obstet Gynecol.* 2006;108:295-302.
6. The partograph, managerial tool for prevention of prolonged labour; WHO Geneva. 1988.
7. Beazley JM, Kurjak A. Influence of a partograph on the active management of labour. *Lancet.* 1972;2:348-51.
8. Duncan GR, Costello E. The partogram: a graphic guide to progress in labour. *NZ Med J.* 1975;82:193-5.
9. Thom MH, Chan KK, Studd JW. Outcome of normal and dysfunctional labour in different racial groups. *Am J Obstet Gynecol.* 1979;135:495-8.
10. Philpott RH, Castle WM. Cervicographs in the management of labour in primigravidae. II. The action line and treatment of abnormal labour. *J Obstet Gynaecol Br Commonw.* 1972;79:599-602.
11. Hendricks CH, Brenner WE, Kraus G. Normal cervical dilatation pattern in late pregnancy and labor. *Am J Obstet Gynecol.* 1970;106:1065-82.
12. Duignan NM, Studd JW, Hughes AO. Characteristics of normal labour in different racial groups. *Br J Obstet Gynecol.* 1975;82:593-601.
13. Cartmill RS, Thornton JG. Effect of presentation of partogram information on obstetric decision-making. *Lancet.* 1992;339:1520-2.
14. Dujardin B, De SI, Kulker R. The partograph: is it worth including the latent phase? *Trop Doct.* 1995;25:43-4.
15. De Groof D, Vangeenderhuysen L, Juncker T. Impact of introduction of partogram on maternal and perinatal mortality. *Ann soc Belg Med Trop.* 1995;321-30.

**Cite this article as:** Mukherjee S, Raksha M, Malini KV. Partogram: an important tool in managing labour!. *Int J Reprod Contracept Obstet Gynecol* 2021;10:3770-4.