Labour and its outcome compared with and without partogram use in primiparous and multiparous women

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Abstract

Background: Partogram is best graphical or pictorial representation of first stage events, in a view to monitor or assess progress of labouri.e, cervical dilatation, and other is descent of head is plotted against time. It gives easy analysis and provide basis for early recognition of any deviation from normal. **Aim and Objective:** Aim of the study is to compare the active phase and outcome of the labour with and without partogram use in primiparous and multiparous women. **Methodology:** A total of 300 antenatal women were selected for the study. All women were followed up till term and delivered at our hospital only. Study subjects include two major groups Primiparous and Multiparous women. All the studied parameters were compared between the groups. Both the groups were subdivided into two, as 'With Partogram' group and 'no Partogram' group. Protocol for managing labour which include uterine contractions, oxytocin infusion, and fetal heart monitoring aiming at normal vaginal delivery till fetal or maternal indication warrants for c-section delivery is followed. **Results and Discussion:** Study subjects includes 300 antenatal women with the gestational age range of 37 – 42 weeks divided into two major groups. First group consists of 162 women who are primiparous and second group consists of 138 women who are multiparous without the history of previous c-section delivery or any other form of uterine surgery. **Conclusion:** The present study showed partogram as an excellent tool for reflecting quick and consistent review of labour events and in handing over the patient in institutes with health personnel changing in shifts.
Keywords: Partogram, Action line, Cervical dilatation, Station, fetal heart rate, Labour

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INTRODUCTION

Partograph or partogram is gold standard for labour monitoring. Partogram is looked as one of the most important advances in modern obstetric care[1]. Partogram is easy to use tool provides health workers pictorial overall view of labour which can identify abnormal labour to allow early intervention to prevent life threating complications as obstructed labour.[2,3] It is a document of communication tool during "hand over of care". Corrective obstetric intervention can be done at appropriate time. WHO advocates its universal use as a necessary tool in management of labour. It is most user friendly. It works as a trigger for referral or transfer of patient being its primary objective. It is a document of communication tool during hand over of care. Monitoring of the woman and fetus during labor is to ensure early identification and timely management of problems to prevent short- and long-term morbidity and mortality.[1,3,4] Partogram is an instrument used to monitor labour, maternal and fetal components.[2,4] Maternal parameters like blood pressure, uterine

contractions, drugs, heart rate, urinalysis, and temperature while fetal parameters like heart rate, state of the membranes and colour of liquor are the parameters can be monitored using a Partogram.[2-4] Monitoring labor can be undertaken in various ways. One method commonly used in developing countries is the partogram (or partograph), which help in the timely identification of obstructed labour, providing enough time for referral to a higher-level health center[5].Common partogram designs incorporate an alert and action line.[5,6] The partograph or partogram is recommended by the World Health Organization (WHO), for monitoring women wellbeing and progress of labour[5]. To understand the issues facing the partograph and its impact on outcomes, a comprehensive evaluation of the evidence is required. The partograph is used as part of an approach to labour monitoring[6,7]. As such, the partograph by its nature is a complex intervention, relying on several factors for effective use, including interaction between a few causal relations, behaviors, and outcomes[8-10].

Aim of the study is to use of partogram for the early detection of prolonged and abnormal progress of labour, to recognize maternal and fetal problems. Also, to reduce the complications in mothers due to prolonged labour in conditions like postpartum hemorrhage, sepsis, uterine rupture and its sequel like death, hypoxia, infections etc. in newborns.

MATERIAL AND METHODS

Sample size and Technique

This prospective observational study was done from the period March 2018 – December 2020.The sample size was calculated considering a precision level of 30% of total annual deliveries ($\geq$ 1000) of maternity hospital and a confidence level of 95%. A total of 300 antenatal women were selected for the study. All women were followed up till term and delivered at our hospital only. Study subjects include two major groups Primiparous and Multiparous women. All the studied parameters were compared between the groups.

Inclusion criteria

Antenatal women both primiparous and multiparous, with a gestational age range of 37- 42 weeks, singleton pregnancies with a live fetus without any complications who are in active phase were recruited.

Exclusion criteria

Women who presented with malpresentations, priorh/oc-section delivery or any other uterine surgery, high risk pregnancies like Pregnancy induced hypertension (PIH), Gestational Diabetes Mellitus (GDM), no proper fetal heart tracings, women with pathological cardiotocography [CTG] at the time of admission were excluded from the study.

Informed consent was taken from all the study subjects before admitted into labour ward. All the patients recruited for the study when they are in active stage of labour. When the uterinecontractions are lasting more than 40 seconds, with cervical effacement more than 80 % and cervical dilatation of 4 cm it is considered that the mother is in active phase of labour. Both the groups were subdivided into two, as 'With Partogram' group and 'no Partogram' group. Protocol for managing labour include early rupture of membrane, uterine contractions, oxytocin infusion where indicated, and fetal heart monitoring aiming at normal vaginal delivery till fetal or maternal indication warrants for c-section delivery is followed. Maternal vitals, haematological and biochemical analyses, obstetric or medical consultation was provided as per obstetric and medical concerns. Uterine contraction was assessed and fetal heart rate was recorded every 15 min in the first stage and at every 5 min interval in second stage of labour. Vaginal examinations were performed when indicated. Inadequate uterine contraction i.e, 3 contractions per 10 min, or cervical dilatation arrest for 2 h following spontaneous onset of labour were augmented with intravenous infusion of oxytocin in both groups. Partogram was used as primary caregiver tool in Partogram group for labour monitoring and guiding the decision of active interference. Induction of labour was done in those women who have poor progression of labour, prolonged rupture of membrane, and postdatism. In no Partogram group the course of labour and maternal condition were documented only as notes in record file and used those notes while making any decision or handing over to the care provider of next shift in labour ward. Records for all events like duration of first and second stage of labour, oxytocin infusion, mode of delivery and neonatal Apgar scores were noted. Any abnormalities of labour like meconium staining of liquor, fetal heart rate abnormalities and maternal complications like prolonged labour, postpartum hemorrhage etc. were also recorded.

Statistical Analysis

All the data is represented as mean and standard deviation for symmetric distribution of parameters, percentage is used for asymmetric distributed data. The data were analyzed using Student's t test and Chi-square test. A p value of < 0.05 was considered as statistically significant.

RESULTS

Present study was undertaken during the period of March 2018 – December 2020 with 300 patients. Study subjects includes 300 antenatal women with the gestational age range of 37 – 42 weeks divided into two major groups. First group consists of 162 women who are primiparous and second group consists of 138 women who are multiparous without the history of previous c-section delivery or any

other form of uterine surgery. On grouping, the patients using age groups, maximum patients were found to belong to the 26-32 age groups. The youngest patient in the study was 19 and the oldest was 30 years. Base line characteristics of all study subjects were shown in table 1. Also, both the groups were compared in respect of basic line demographic features like age, gestational week, height, no. of uterine contractions, urine output, fetal heart rate, cervical dilatations etc(Table 2 and Table 3; Figure 1 and Figure 2). No significant difference was found in mean duration of active phase of labour between two groups. The requirement of Oxytocin augmentations and number of vaginal examinations were also equal in both group (Table 2). Though in Partogram group higher incidence of vaginal delivery was observed, that was not found statistically significant (Table 4, Figure 3). Commonest indication for C-section in both groups was fetal distress followed by non-progress of labour in the active phase, The maternal and neonatal morbidities were not significantly different in either group (Table 4). Fetal parameters i.e outcome of the delivery details are mentioned in Tables 5.

Table 1: Base line characteristics (n = 300) in all study subjects

Parameter	Mean ± SD
Age (Years) (19-30)	27.5 ± 6
Parity (1-4)	2 ± 1.5
Gestational age (37 – 42)	38.6 ± 0.4
Height (cm)	155.4 ± 4.6
Pulse (bpm)	74.5 ± 7.8
DBP (60 – 90 mmHg)	78.5 ± 10.2
SBP (90-120 mmHg)	110 ± 13.5
Number of uterine contractions per 10 minutes (3-7)	5.5 ± 4.5
Urine Output (500 – 800)	650 ± 75
Fetal Heart Rate (bpm) (120 – 160)	135 ± 18
Time for rupture of membranes to delivery (Minutes) (30-210)	52.5 ± 33.6
Primiparous	162
Multiparous	138

Table 2: Comparison of different parameters with and without partogram groups in Primiparous women

Parameter	Primiparous		P value
	With Partogram (n=80)	No Partogram (n=82)	
Age (years)	20.6 ± 1.8	23.5 ± 3.4	0.0001
Gestational week	37.5 ± 1.7	38.5 ± 1.6	0.0001
Height (cm)	150.3 ± 4.5	150 ± 3.7	0.64
No. of uterine contractions	29.5 ± 10.6	30.7 ± 10.5	0.47
Cervical dilatation (in cm)	3.5 ± 2.0	4.0 ± 2.2	0.13
Rate of cervical dilatation (cm/hour)	1.8 ± 0.8	1.9 ± 1	0.48
Duration of the Labour	3.0 ± 0.9	3.4 ± 1.6	0.05
Oxytocin Infused	5.5 ± 3.2	6.9 ± 3.8	0.01

Table 3: Comparison of parameters with Partogram and no partogram groups in Multiparous women

Parameter	Multiparous		P value
	With Partogram (n=75)	No Partogram (n=63)	
Age (years)	21.5 ± 1.3	26.2 ± 1.6	0.0001
Gestational week	38.3 ± 1.8	39 ± 2.3	0.001
Height (cm)	147 ± 5.2	145.6 ± 3.0	0.06
No. of uterine contractions	10.8 ± 1.6	8.2 ± 2.8	0.0001
Cervical dilatation (in cm)	1.9 ± 1.4	2.1 ± 1.0	0.34
Rate of cervical dilatation (cm/hour)	0.7 ± 0.2	0.6 ± 0.4	0.05
Duration of labour	3.0 ± 1.3	3.6 ± 0.6	0.001
Oxytocin Infused	5.0± 3.8	5.4 ± 3.3	0.51

Table 4: Comparison of parameters based on mode of delivery on groups with and without partogram

Mode of delivery	With Partogram (n=155)	No Partogram (n=145)
Normal Vaginal Delivery	113 (72.9%)	97 (66.8%)
Spontaneous	72 (63.71%)	63 (64.9%)
Induced	41 (36.2%)	34 (35.1%)
C-Section Delivery	42 (27.1%)	47 (32.4%)
Fetal distress/Meconium-stained liquor	20 (47.6%)	26 (55.3%)

Prolonged labour	2 (4.3%)	5 (10.6%)

Table 5: Characteristics of the newborn

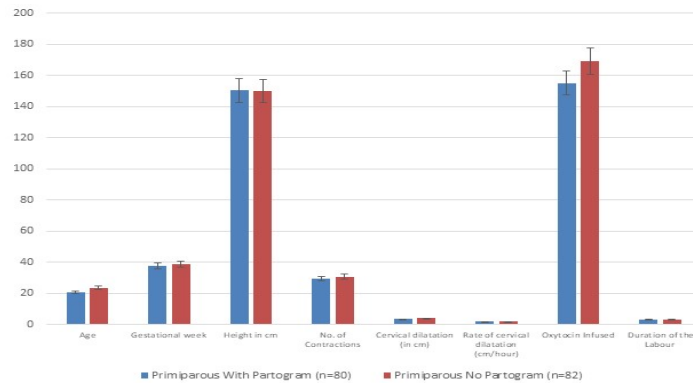| Parameter	With Partogram (n=155)	No Partogram (n=145)
Weight (2850-4100)	3080 ± 339.6	2996 ± 480
Apgar Score at 1 minutes (5-7)	23	15
Apgar score after 5 minutes (7-10)	6	4
Female (Gender) (%)	87	74
Male (Gender) (%)	68	71

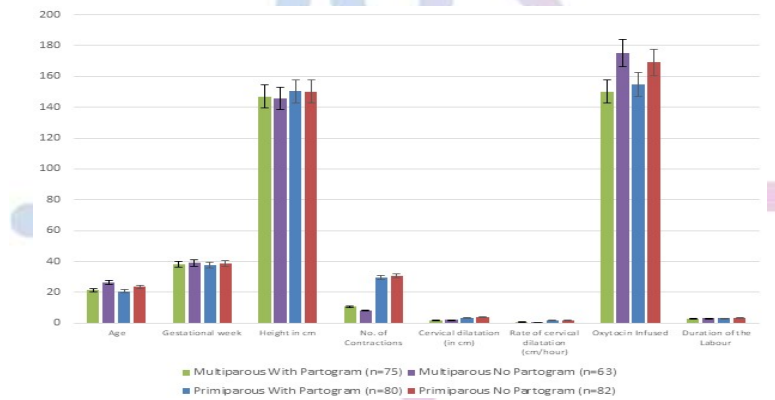**Figure 1:** Comparison of parameters with and without partogram in primiparous women

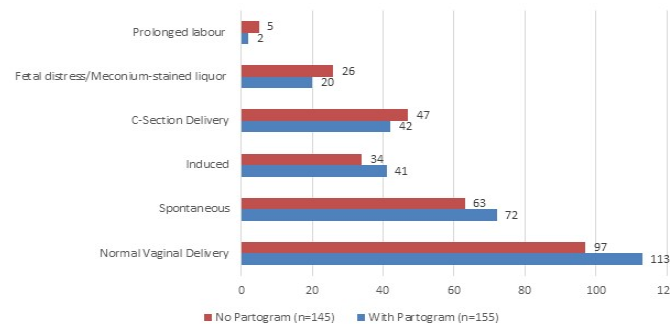**Figure 2:** Comparison of parameters in Multiparous women with and without partogram

Figure 3: Comparison of parameters based on mode of delivery with and without partogram

DISCUSSION

Monitoring labor can be undertaken in various ways. One method commonly used all over the world is the partographorpartogram. The partogram is a tool that enables midwives and obstetricians to record maternal and fetal observations[11,12]. WHO has recommended universal use of a partogram during labor to aid in clinical decision-making[5]. This WHO recommendation has not changed

despite a 2009 Cochrane review of five randomized controlled trials (including both high- and low-resource countries) which found that using a partogram had no benefit on reducing cesarean section rates, instrumental vaginal delivery, or Apgar scores of less than seven at five minutes post-birth (WHO, 2014)[5,13,14]. In addition, the evidence to support this recommendation is limited; even after the WHO simplified the partogram model to make it more user-friendly, it is still rarely used in low-resource areas, and when used, it is rarely interpreted correctly (WHO, 1994). The paperless partogram is a low-skill method for preventing abnormal labor[14, 15]. It is designed to monitor not only the progress of labor, but also the condition of the mother and the fetus during labor. Paperless partogram needs no graph paper, no extra time to do it and uses the routine that the nurses are already used to. It gives the two-basic data on which the partogram works namely (The Alert line and The Action line)[12,14,15]. This method involves only calculate alert and action times by adding six hours to the time when a woman reaches 4 cm of dilatation (alert line) and adding four hours to the alert time (action line); based on rational that cervix should dilate 1 cm per hour between 4 cm and 10 cm. If there is no birth at alert time, refer to care and if no birth by action line, immediate delivery (Technologies for Health Consultative Meeting, 2015)[16]. Very little research done to test the effectiveness of paperless partogram in the management of labor and its acceptance from heath care providers (Nurses midwives and Obstetricians)[14,16,17]; so it is important to conduct the present study that aimed to evaluate, prospectively, the effect of use the paperless partogram on the management and outcome of labor and to assess the nurses' opinion about using it. In the present study, partogram was used for the management of labor in 145 laboring women. The base line data of women revealed that; their average diastolic blood pressure was 78.5 ± 7.8 mmHg, their average systolic blood pressure was 110 ± 13.5 mmHg. Uterine contractions had an average of 5.5 ± 4.5 contractions per 10 minutes. These results is slightly similar to the finding conducted in a tertiary care hospital of Uttar Pradesh -India which used the paperless partogram for out of 91 women who participated in the study which revealed that the mean systolic BP of the participants was 124 mmHg[14,15,16]. The mean diastolic BP of the participants was 73 mm of Hg[13, 14]. In our present study 300 patients were included, of which 82 patients were before alert line, 208 were between alert and action line and 10 patients were beyond action line. Out of the 82 before alert line 8 underwent LSCS, 6 of whom had fetal distress of which 4 had meconium-stained liquor,one had prolonged fetal tachycardia and the other had fetal bradycardia. Due to early intervention none of the babies" required NICU care or ventilator supports.

64 of the 208 had uncomplicated vaginal delivery. 6 had instrumental deliveries, 5 due to poor maternal efforts and one due to fetal distress. 42 patients were in between alert and action lines, 22 had LSCS, 7 due to failure to dilate satisfactorily, 5 due to fetal distress, 4 for unsatisfactory descent, 6 had meconium-stained amniotic fluid with prolonged variation in fetal heart rate. 17 had instrumental delivery, 2 due to fetal distress in the second stage, 4 due to poor maternal efforts during second stage, 5 due to unsatisfactory descent, 2 for meconium stained liquor in the second stage, 4 of them developed hypotonic contractions in the second stage of labour. 24 patients were started on oxytocin, among which 7 had hypotonic contractions, and in the rest in was started to accelerate labour and there by avoid undue complications. All the above interventions were made with respect to the Partogram plotting, which helped us to recognize undue prolongation in labour; meconium-stained liquor, fetal distress, and non-descent early and thereby reduce maternal and neonatal morbidity.

CONCLUSION
The present study clearly demonstrates that in 'with partogram' group quality of delivery care with respect to the identification of dystocia helpsin decidingeffective interventions. Using the Partogram with alert and action lines during labourcan diagnose dystocia, changing intuitive conduct into a precise action. It is also evident from the present study that active management in primigravidae using partogram has reduces unnecessary strain to mothers by reducing total duration of labourwithout any increased fetal morbidity and mortality. The only disadvantage inpartogram is, it requires continuous monitoring but at the same time it gives satisfaction to labouring women as she is monitored by the same doctor there by lessening her anxiety. The present study showed partogram as an excellent tool for reflecting quick and consistent review of labour events and in handing over the patient in institutes with health personnel changing in shifts.

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