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The clinical evaluation of course of labour using modified who partograph

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Abstract

Partograph is an inexpensive, accessible managerial tool which has been endorsed by WHO for monitoring of labour. Various types and designs of partograph are being used at various centers. Recently, WHO introduced simplified version of partogram, for the use by skilled birth attendant. In our study we evaluated the nulliparous labour using this modified partogram in a teaching and tertiary care setup. This study was conducted at Jawaharlal Nehru Medical College; Ajmer included 400 nulliparas with uncomplicated pregnancy at term. Using WHO modified partogram, characteristics of nulliparous labour and neonatal outcome was evaluated. Following are the results of the study. Mean gestational age was 39.07 weeks, mean duration of first stage labour -3.586 ± 2.103 hrs, mean duration of second stage of labour -35.01 ± 24.48 minutes, mean total duration of labour -4.08 ± 2.277 hrs. In our study 44% patients delivered without any augmentation while in another 56% with labour augmentation. We didn't find any difference in monitoring of labour using modified version of WHO partogram compared with other partograms, apparently its more simpler to plot and easy to understand.

Keywords: LSCS, PROM, IUGR, CPD

Introduction

Partograph is a graphic record of key events in labor and provides an early warning system of progression of maternal and fetal condition during labor that is not progressing normally at an early stage and helpful in its management. The World Health Organization Partograph is the best-known Partograph in the low-resource setting. Partograph when used with defined management protocols is an inexpensive tool for reducing the number of operative interventions, prolonged labor, obstructed labor and caesarean section^[1].

It is a single sheet of paper which includes information about the fetal heart rate, uterine contraction, any drugs used and other important factors that could help avoid extensive descriptive notes. It is a practical device when employed in a busy labour room with many cases, but limited personnel to screen for abnormal labour. With its use, there is no need to record labour events repeatedly. It helps predict deviation from normal progress of labour, and supports timely and proven intervention. It also helps to facilitate responsibility to the person conducting labour^[2] The first WHO partograph or 'Composite partograph', covers a latent phase of labour of up to 8 hours and an active phase beginning when the cervical dilatation reaches 3 cm. The active phase is depicted with an alert line and an action line, drawn 4 hours apart on the partograph.

This partograph is based on the principle that during active labour, the rate of cervical dilation should not be slower than 1 cm/hour. Since a prolonged latent phase is relatively infrequent and not usually associated with poor perinatal outcome, the usefulness of recording the latent phase of labour in the partograph has been questioned. Moreover, differentiating the latent phase from false labour is often difficult^[3]. To alleviate these disadvantages, a modified WHO 'partograph' was introduced and incorporated removal of the latent phase and defined the beginning of the active phase at 4 cm cervical dilatation instead of 3 cm^[4]. Therefore, we focused to evaluate the maternal and perinatal outcome by using WHO modified partograph.

Methodology

This prospective observational study was conducted at RMC, J.L.N Medical College, Ajmer during March 2020 to June 2021 on 400 cases admitted to labour room were selected according to inclusion and exclusion criteria and were monitored by using "Modified WHO Partograph."

All 400 cases (primigravida) Women with live fetus aged between 20-35 years, gestational age between 37-42 Weeks, cephalic presentation with singleton pregnancy with vertex presentation, without any obvious risk factors and those who was suitable for vaginal delivery, on initial examination were included in the study.

If the Age < 20 and >35 years with multigravida, gestational age less than <37weeks and >42 weeks and pregnancy with malpresentation with APH, pregnancy with gross CPD, hydramnios, prematurity, PROM, IUGR, multiple pregnancy, contracted pelvis, pregnancy with associated systematic diseases known to have effect upon course of labor like DM, heart diseases, asthma, hypertension, immune compromised status, severe anemia (Hb less than 6gm/dl), Severe oligohydramnios, intrauterine foetal death (IUFD), previous caesarean section plus breech presentation, Human Immunodeficiency Virus (HIV) plus breech presentation, preeclampsia plus latent phase of labour and elective caesarean section were excluded because the partograph completion is not recommended for mothers with the aforementioned characteristics.

The study group was divided into

Group I: Cervical dilatation and descent curve falling to the left of alert line (normal partograph) and

Group II: Cervical dilatation and descent curve falling to the right of alert line indicate dysfunctional labor (abnormal partograph).

Patients were monitored in the labor room and progress of labor and the vital information was recorded in the WHO modified partograph. Graphical recording was started when patient enters in active phase spontaneously i.e. when cervix is 4cm or more dilated. Per vaginal examination was performed at the time of admission to know the pelvic assessment, bishop score. Cervical finding was assessed 2 hourly by Doing vaginal examination. Presence or absence of membrane, color of liquor, descent of the head and moulding of fetal skull were also recorded. Intensity and duration of uterine contraction were noted half hourly, FHS was recorded with the help of stethoscope, half hourly and monitored more frequently if found abnormal. Maternal blood pressure and temperature was recorded 2 hourly. Pulse was recorded half hourly. Urine examination for volume and protein (albumin) was carried out and recorded. Any medications and fluid intake given, also noted.

The time of start of recording partograph was taken as 0 time. Alert and action line was made to assess progress of labor with four hours difference. Progress of labor was labelled normal if the plotting of cervical dilatation remained on the alert line or to the left of it. The augmentation was decided according to the Bishop score, strength and duration of uterine contraction. Augmentation was done either with surgical method, that is amniotomy or with medical method, by using oxytocin. The augmentation was done with oxytocin infusion.

Maternal outcome was analyzed by studying various parameters like mode of delivery, postpartum haemorrhage, need for blood transfusion and obstetric injuries (cervical, vagina & perineal). The perinatal outcome was analyzed by studying various parameters like condition of baby at birth (live birth/still birth), APGAR score at 1min and 5min, admission in neonatal intensive care unit. Duration of labor in hours and mode of delivery (spontaneous vaginal, instrumental vaginal delivery or cesarean section) in relation to normal and abnormal partograph were noted.

Statistical analysis

The data was coded and entered into Microsoft Excel spread sheet. Analysis was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. Descriptive statistics included computation of percentages, means and standard deviations. The unpaired t-test (for quantitative data to compare two independent two groups) was used for quantitative data comparison of all clinical indicators. Chi-square test was used for qualitative data whenever two or more than two groups were used to compare. Level of significance was set at $P \leq 0.05$.

Results

In our study group we had 51.5% of patients with age group 18-21 year followed by 41.3% of patients with age group 22-25 years. Out of 400 nulliparous patients enrolled in the present study, 375 (93.8%) were primigravida while only 25 (6.8%) were multigravidas. The gestational age of patients with 40-41 were higher in 152 (38.0%) followed by 39-40 weeks in 131 (32.8%) patients and the mean gestational age was 39.07 weeks. The cervical dilatation with 4 cm was found in 233 (58.25%) patients followed by 64(16.0%) patients with 5cm cervical dilatation.

Duration of first stage labour was calculated from the time of cervical dilatation at 4cm till the cervix became fully dilated or 8cm dilatation. Our data has given that the duration of 1st stage of labour ranged from 1.32 – 9.3 hours with a mean of 3.58 ± 2.10 hours. The second stage labour duration was calculated from the time of full dilatation of cervix to delivery of the baby which was found between 20-40 min in 184(46.0%) patients followed by <20 min in 116 (29.0%) patients. Mean duration of 2nd stage of labour was 35.01 ± 24.48 min.

The total duration of labour was calculated by adding first and the second stage of labour. Total mean duration of nulliparous labor was found to be 4.08 ± 2.28 hr. The majority of 27.5% total duration of labor was 2.31 – 4.0 hours. It was found that 176 patients (44%) delivered without any augmentation while in another 224 patients (56%) labor augmentation was done. In present study augmentation of labor was done using amniotomy, oxytocin or both and was individualized based on uterine contractions.

Out of 400 patients, 89.3% (357) were admitted in spontaneous labor while in 10.7% (43) patients labor was induced. Induction was done due to reasons of prolonged pregnancy (23.25%), PROM (62.79%), severe preeclampsia (13.96%). Out of the 42 caesarean sections, 14 were performed in first stage of labour and the remaining 28 in second stage. Labour augmentation was done on 71.42% patients. In our study, 28 sections were performed in second stage. In all these patients labour dystocia in form of fetopelvic disproportion was present either in form of malposition (deep transverse arrest) or inadequacy of maternal pelvis (CPD) which became more apparent in second stage of labour.

With pattern of abnormal labour & mode of delivery, Arrest of dilatation was the most common (31.25%) abnormal labour pattern observed; other being protracted descent (25%) and Protracted dilatation (25%). All cases of arrest of descent underwent caesarean section. All of protracted dilatation cases needed operative intervention; three had instrumental vaginal delivery and five underwent caesarean section. Of the 8 cases of protracted descent, 6 delivered normally, and 2 underwent caesarean section. Comparison of spontaneous and induced labours were studied, there was a significant difference between the group in first stage labor duration [$p=0.006$ (S)], Normal

delivery [P=0.001(S)] and LSCS rates [P=0.001(S)]. Further, comparison of duration of labour, mode of delivery in between various groups was studied, in all the 3 groups, 1st stage, 2nd stage, Total duration, Normal and LSCS remained highly statistically significant p=0.001(S).

In our study the group 1 patient delivered left to the alert line and group 2 and 3, the patient right to the alert line was compared, we further analysed them into subgroup (augment, induced) it was evident that the total duration of the labour was almost double in patients right to the alert line. Greater number of the patients 267 (66.75%) delivered after induction and augmentation. Patients delivered vaginally were 358 (89.5%) and patients delivered by LSCS were 42 (10.5%). In our study significant difference was found between two groups in duration 1st stage of labour 0.01 (S), Total duration of labour 0.02 (S), Augmented labours 0.001 (S) and normal vaginal births 0.01(S).

Discussion

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 high 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 [5]. The mean age found in the present study was 21.94 yrs., which is favorable age (18-25yrs) for conception with least pregnancy related complications.

In our study, out of 400 nulliparous patients enrolled in the present study, 375 were primigravida while only 25 were multigravidas. Out of 375 primigravida 337(89.87%) were vaginal delivered and 38(10.13%) were cesarean and out of 25

multigravida, 21 were vaginal delivered and 4 were cesarean, similar study done by Shrotri AN *et al.* [6], 5.7% primigravida required caesarean section and 79.9% delivered vaginally.

The mean gestational age was 39.07 weeks 89.5% patients delivered 2 weeks prior and 1 week following expected date of delivery. Induction of labour is indicated when the benefits to either to the mother or the fetus outweigh than those of continuing the pregnancy. Indications include emergent conditions such as ruptured membranes with chorioamnionitis or severe preeclampsia. More common indications include membrane rupture without labor, hypertension, post term pregnancy, and various maternal medical conditions such as chronic hypertension and diabetes (American College of Obstetrics and Gynecologists, 1999a).

Women whose labor is induced have an increased incidence of chorioamnionitis and cesarean delivery compared with those in spontaneous labor. Several factors increases the success rate of labour induction and include multiparity, BMI <30, favourable cervix and birth weight <3500gm (Peregrine and associates, 2006; Pevzner and co-workers, 2009) [7].

Though in our study Out of 400 patients, 357 were admitted in spontaneous labour while in 43 patients labour was induced. In 43 patients induction was done due to reasons of prolonged pregnancy (2.5%), PROM (4.3%), severe preeclampsia (1.5%). Duration of first stage of labor is the time taken by the cervix to dilate from 4cm to 10cm. It is plotted on the center component of partogram i.e. cervicograph.

The reason for varying duration is probably due to the difference in the cervical dilatation point at which the cervicograph was started to be plotted by various authors and also because of different rates of cervical dilatation in a given population. In our study we found mean first stage labour duration as 4.07 + 2.28 hr.

Table 1: Showing duration of first stage of labour in various author series

Author	Duration of first stage of labour
Present Study (2022)	3.58 ± 2.10 hrs with statistical maximum of 8.5 hrs
Verma Priyanka <i>et al.</i> (2010) [8]	3.337±1.444 hrs with statistical maximum of 9.30hrs
Zhang & colleague (2002) [9]	5.5 hrs
Pierre Drouin (1979) [10]	6.1+ 3.9 hrs
Daftary & Mahatre (1977) [11]	7.50 hrs
Studd (1973) [12]	6.30 hrs
Hendricks (1970) [13]	4.8 hrs
Friedman (1955) [14]	4.9 ± 3.4 hrs with statistical maximum of 11.7 hrs

A number of observational studies, however, have reported wide variations in mean, median, and centile values of the rate of cervical dilatation. This may explain the lack of uniformity in size and shape of the partogram and the timing of the alert and action lines on a number of partograms that deviate from Philpott's original version. The rates of cervical dilatation in nulliparous range from a minimum of 1.2 up to 6.8 cm/hrs (Friedman) [14]. In obstetrics, the establishment of nomograms based on locally derived rather than on population data; has been applied to foetal growth, foetal biometry, and birth weight. Because maternal and foetal anthropometry vary among population groups, nomograms reflecting the characteristics of a specific population are likely to be more representative and clinically more relevant. There is no reason to rule out that the same principle could apply to labour characteristics.

In our study total mean duration of nulliparous labour was found to be 4.07 + 2.28 hr. The standard partogram's alert line, defined as a rate of cervical dilatation of 1 cm/h, represents the mean rate of cervical dilatation of the slowest 10% of primigravid

spontaneous labours [15], though it would more appropriate to select rate of cervical dilatation in lowest 10th centile in a given population of nulliparas. In our study population rate of cervical dilatation in lowest 10th centile is around 1cm/hr (0.99cm/hr) compared to study done by L.-J. van Bogaert [16] in South Africa where he found it as 0.86cm/hr or 1.2times slower than standard alert line and can be used to construct alert line similar to standard partogram's alert line.

Duration of first stage of labour from various cervical dilatation points found that mean duration of first stage of labour was 3.58 ± 2.10 hrs which found similar results like Friedman [14] curve.

There was increasing cervical dilatation rate up to 7cm beyond which there decrease in mean rate of cervical dilatation representing deceleration phase seen in Friedman S-curve.

Duration of second stage of labour begins when cervical dilatation is complete and ends with delivery of fetus. The median duration is about 50 minutes for nulliparas but it can be highly variable (Kilpatrick and Laros, 1989) [17]. The mean duration of second stage was found to be marginally reduced to

35.01 ± 24.48 mins in our study which was found similar to Kunal K Shinde *et al.* (2012) ^[18] 42.1 mins ± 11.42, Ajay Sharma *et al.* (2016) ^[19] 33.64 min + 23.85 and Jyoti Godara *et al.* (2018) ^[20] 0.85±1.65 hr.

The mean duration of labour in our study was 4.08 hr ± 2.27 similar results were found by Ajay Sharma *et al.* (2016) ^[19] 3.96+1.5 hr and Verma Priyanka ^[8] 3.96 ± 1.58. These results suggest that normal human labour is relatively short. In our study total mean duration of labour being 4.08 hr ± 2.27 hrs. Kilpatrick and Laros (1989) ^[17] 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.

Augmentation refers to stimulation of spontaneous contraction that is considered inadequate because of failed cervical dilatation and fetal descent. Our study 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.

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 primigravida as requiring active management of labour:

Present study (2022) –56%

Ajay Sharma (2016) ^[19] – 60%

Verma Priyanka (2011) ^[8] – 60%

O'Driscoll and Stronge (1975) ^[21] – 55%

Philpott & Castle (1972) ^[22] – 11%

Ledge & Whitting (1972) ^[23] – 14%

O' Driscoll (1969) ^[24] – 20%

The high incidence of active management in our study is due to the labour protocol followed in our study. There were 30 LSCS in augmentation requiring group which was 13.39%, which means 86.61% of nulliparas improved with augmentation subsequently delivering vaginally. In our study 89.5% of nulliparas delivered normally in which, forceps was applied in 3 cases (0.83%) and 4(1.11%) face to pubis delivery, 10.5% had caesarean section. In our institute which a tertiary level referral hospital caesarean section rate is around 42-43%, out of which 85% caesareans are performed for the indications of previous LSCS, primi with breech presentation, foetal distress, CPD. In our study, we found 10.5% caesarean rate in nulliparas which is relatively low compared to the high rates of caesarean in our institute. This is due to the fact that once the patient enters active labour (cervical dilatation ≥4cm) progress of labour is smooth and rapid, and also with the liberal use of oxytocin for labour augmentation. The rates of caesarean sections vary widely in various studies, due to reasons of varied study population, parity, labour management protocols.

Table 2: Caesarean section rates in various studies

Study	LSCS Percentage
Present study (2022)	0.112
Ajay Sharma <i>et al.</i> (2016) ^[19]	6%
Kunal Shinde <i>et al.</i> (2012) ^[18]	10%
Verma Priyanka <i>et al.</i> (2012) ^[8]	6%
O' Driscoll ^[21]	0.03
Composite WHO partograph ^[25]	0.045
Karachi ^[26]	0.064
Mathews and partogram ^[25] Mathai ^[27] , on simplified	0.032

In our study, 42 caesarean sections were performed for the following indications as show.

Table 3: Indications for caesarean sections in our study Indication of LSCS

Indication	1 st Stage	2 nd Stage	Frequency (%)
AD	5	0	11.90
AOD	0	10	23.81
Brow presentation	0	1	2.38
CPD	0	6	14.29
DTA	0	6	14.29
FD	2	0	4.76
MSL, FD	5	0	11.90
PD	2	0	4.76
POD	0	5	11.90

Of the 42 caesarean sections, 14 were performed in first stage of labour and the remaining 28 in second stage. Handa and Laros (1993) diagnosed active-phase arrest, defined as no dilatation for 2 hours or more, in 5 percent of term nulliparas. This incidence

has not changed since the 1950s (Friedman, 1978) ^[15]. In our study this incidence was 1.75%. Fetal descent largely follows complete cervical dilatation. Moreover, the second stage incorporates many of the cardinal movements necessary for the fetus to negotiate the birth canal. Accordingly, disproportion of the fetus and pelvis frequently becomes apparent during the second stage. Common clinical findings in women with ineffective labour having fetopelvic disproportion are: excessive fetal size, inadequate pelvic capacity and malpresentation or malposition of the fetus ^[28].

In our study, 28 sections were performed in second stage. In all these patients labour dystocia in form of fetopelvic disproportion was present either in form of malposition (deep transverse arrest) or inadequacy of maternal pelvis (CPD) which became more apparent in second stage of labour. Friedman and Sachtelban ^[15, 29] found more than 50% incidence of CPD among women secondary arrest of descent and protracted descent. In the study by A.N. Shrotri (1991) ^[6], it was found to have a higher incidence of CPD and fetal malposition among women with prolonged II stage.

Dutta and Pal (1978) [30] in their study found 63.5% incidence of CPD in women with secondary arrest of descent progressing to obstructed labour. Sarkar and Paul (1990) [31] found that the incidence of CPD was 69.7% among women with secondary arrest of descent. The woman who underwent LSCS for brow presentation which was misdiagnosed at 4 cm cervical dilatation as a face presentation and she was given trial of labour considering the average weight baby and good pelvis in hope that she will delivered vaginally. The mean birth weight was 2.85 kg in the LSCS group. There was 7 babies were shifted to NICU for low APGAR score, 1 among them died after 4 hrs (cause of death was meconium aspiration with severe birth

asphyxia).

We had 3 (0.83%) forceps delivery, indication were fetal bradycardia and poor maternal bearing down efforts. The mean duration of second stage in these patients was 45.16 mins and the mean birth weight 2.9 kgs. The longer duration of second stage and comparatively higher birth weight in this group of patient is indicative of dystocia which led to operative delivery in them. There were four face to pubis deliveries, second stage lasted for 45mins, average birth weight was 2.7kg and two babies had APGAR score >7 at birth and two babies had APGAR score <7 at birth and had NICU admissions due to birth asphyxia.

Table 4: Clinical information of patients

Duration of 1 st stage of labour (Hrs)	Frequency	Percent
<1.3	63	15.8
1.3-2.3	71	17.8
2.3-3.3	86	21.5
3.3-4.3	53	13.3
4.3-5.3	41	10.3
5.3-6.3	52	13.0
6.3-7.3	23	5.8
7.3-8.3	8	2.0
8.3-9.3	3	.8
Total	400	100.0
Mean	3.58 ± 2.10	
Duration of 2 nd stage of labour (Hrs)	Frequency	Percent
<20	116	29.0
20-40	184	46.0
40-60	69	17.25
60-80	8	2.0
80-100	6	1.5
100-120	17	4.25
Total	400	100.0
Mean	35.01 ± 24.48	
Duration of labour (Hrs)	Frequency	Percent
1.0-2.3	97	24.3
2.31- 4.0	110	27.5
4.01-5.3	72	18
5.31-7.0	78	19.5
7.01-8.3	30	7.5
8.31-10.0	11	2.5
10.01-11.3	2	0.5
Total	400	100.0
Mean	4.08 ± 2.27	
Augmentation	Frequency	Percent
No augmentation done	176	44
ARM	78	19.5
Oxytocin	48	12
ARM + Oxytocin	98	24.5

From our study we felt, this modified partogram can be made more easy and simple by using a single line i.e. alert line. Labour remaining left to or on this line to be considered normal while any deviation to right side to be taken as abnormal. Any deviation from normal will warrant action from the obstetric

caregiver, let be the referral service or labour augmentation at appropriate centres. It is suggested that every woman in labour must be benefitted by this scientific approach of labour management i.e. with the use of modified WHO partograph.

Table 5: Mode of delivery in patients

Mode of delivery	Frequency	Percent
Normal	358	89.5
LSCS	42	10.5
Total	400	100.0
Group wise division patients based on alert and action line	Frequency	Percent
Group 1	328	82.0
Group 2	56	14.0
Group 3	16	4.0
Total	400	100.0

Table 6: Pattern of abnormal labour & mode of delivery

Pattern of abnormal labour	No. of cases	Mode of Delivery			
		Spontaneous	Instrumental	LSCS	
Arrest of dilatation	6 (18.75%)	0	0	6	
Protracted descent	8 (25%)	6	0	2	
Protracted dilatation	8 (25%)	0	3	5	
Arrest of descent	10 (31.25%)	0	0	10	
Total	32	6	3	23	
Comparison between spontaneous and induced labours		Spontaneous	Induced	P-value	
Augmentation (Y/N)		201/156	20/23	0.13	
1 st stage		3.48±2.08	4.41±2.13	0.006 (S)	
2 nd stage		34.72±24.72	43.67±40.04	0.15	
Total duration		4.57±11.907	5.04±2.55	0.79	
Normal		326	32	0.001 (S)	
LSCS		31	11	0.001 (S)	
Comparison of duration of labour, mode of delivery in between various groups		Group 1	Group 2	Group 3	P-value
1 st stage		3.07±1.79	5.76±1.91	6.38±1.58	0.001 (S)
2 nd stage		31.66±20.12	37.32±23.78	110.31±45.03	0.001 (S)
Total duration		3.48±1.89	6.28±1.97	8.12±1.56	0.001 (S)
Normal		302	52	1	0.001 (S)
LSCS		26	4	15	0.001 (S)
Comparison of patients remaining left to the alert line with patients right to the alert line		Patients left to alert line (n=328)	Patients right to alert line (n=72)		P-value
duration 1 st stage		3.07 ± 1.79 hr	5.90 ± 1.85 hr		0.01 (S)
duration 2 nd stage		31.40 ± 18.83 min	51.45 ± 37.43 min		0.47
Total duration		3.50 ± 1.89 hr	6.69 ± 2.03 hr		0.02 (S)
Induced Labour		29	14		0.76
Augment labour		162	62		0.001 (S)
Normal		305	53		0.001 (S)
LSCS		23	19		0.08

From our study, we also realized the significance of alert line on partogram should be based on lower 10 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, modified partogram is good enough for monitoring labour progress of our local population.

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