European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 9, Issue 3, Winter 2022

ORIGINAL RESEARCH

To detect abnormal labour at an early stage in primigravida by partogram

[1]Dr Senadhipati Shakunthala, [2]Dr Padma Pilli, [3]Dr.Y.Radhika Ganesh,[4]Dr.MobineAhamad S, [5]Dr KotiMythri

[1]Associate Professor, Department of Gynaecology Obstetrics, Government Medical College,Nalgonda, Telangana, India
[2]Senior Consultant, Department of Gynaecology Obstetrics, City Super Speciality Hospital, Hyderabad, Telangana, India
[3]Associate Professor, Department of Gynaecology Obstetrics, Government Medical College, Mahaboobnagar, Telangana, India
[4]Assistant Professor, Siddhartha Government Medical College, Vijayawada, Andhra Pradesh, India
[5]Medical Student, Gandhi Medical College, Secunderabad, Telangana, India

Correspondence:
Dr.Mobine Ahamad S
Assistant Professor, Siddhartha Government Medical College, Vijayawada, Andhra Pradesh, India

ABSTRACT

Aims: To detect abnormal labour at an early stage in Primi gravida and toassess the management options for different types of abnormal labours detected bypartogram.

Materials and methods: It is a prospective study in which 100 antenatal patients were admitted to the department of Obstetrics and Gynecology. For all patients in the 100 Primigravida, Singleton pregnancy, term gestation in labor, and Cephalic presentation with vertex as the presenting part, a modified WHO partogram was adopted.The patients are divided into three groups, and the partogram is divided into three zones throughout the research. Group A: Patients who deliver before the alert line is reached are in the safe zone. Patients who deliver after the alert line but before the action lines are placed in Group B. Patients who give birth after the action line is crossed are in Group C.

Results: The study's average age was 22.94 years, with a standard deviation of 3.21 years. Out of a total of 100 patients, 72 percent had FTNVDs, 2% had outlet forceps, 6% had vacuum application, and 20% had LSCS. Patients in group A had FTNDs in 97.8% of cases, instrumental deliveries in 2.2% of cases, and no LSCS. Sixty-five percent of patients in group B had FTND, 16.2% had instrumental deliveries, and 23.3 percent experienced LSCS. 9 percent of those in group C had FTNVD and 91 percent had LSCS.The average length of labour in the first stage was 8.08 hours, while the second stage was 55.56 minutes. Patients in Group A, who had a favourable partogram, had a high incidence of FTND. Intervention is more common in Group B patients, but the majority of Group C patients were at risk and needed surgery. The majority of the infants born were full-term. The majority of newborns delivered had an APGAR score of 7-8 at one minute and 9-10 at five minutes. There were no problems in 89 percent of individuals. There were no difficulties in 83 percent of the newborns.89% patients had no maternal complications. 83% babies had no neonatal complications.

Conclusion: The use of a partogram is a simple, safe, low-cost, and extremely successful method of tracking labour progress. As a result, it detects abnormalities early and delivers them safely and on schedule thanks to active labour management.
Keywords: Partogram, Labour, Primigravidae, Active management.

INTRODUCTION

"Of all the journeys we do throughout our lives, the most risky is the one we take via the birth canal." That is why it is critical to ensure that this trip is safe for both the baby and the mother. Normal labour is a physiological process in which the frequency, intensity, and duration of uterine contractions gradually increase, resulting in progressive effacement and dilatation of the cervix, descent of the presenting part, and delivery of the foetus through the birth canal, followed by expulsion of the placenta.Labor is the last stage of pregnancy. It is a particular period for each woman, both emotionally and physically. It's a period of high physical activity, tension, and discomfort, and it might lead to overt or covert harm. Women's care during labour should not only assist them in coping with the strain, stress, and discomfort of labour, but also minimise and eliminate the risk associated. This physiological process may sometimes turn pathological, and failure to identify this can result in extended labour, with increased morbidity and death for both the foetus and the mother as a consequence.A partogram, which is a record of the progress of labour and the mother and foetal state during labour against a time scale, is considered by most experts to be the finest approach to monitor labour. Friedman created the foundation for scientific investigation of the progression of labour in 1954, when he plotted the rate of cervical dilatation against time. The current partograph is based on the resultant graph of cervical dilatation. Plotting cervical dilatation and displaying component descent against time enables for objective visual documenting of labour progress and facilitates clinical interpretation of the dynamic changes that occur throughout labour.The partogram is a low-cost method for providing a continuous graphical picture of labour that is critical for monitoring and managing labour. It is a single sheet of paper that contains all labor-related information. Any variation from the typical curve warns the attendant that a labour disturbance may be on the way. It aids in the identification, categorization, and control of dysfunctional labour. With virtually total success, it is feasible to control the length and pace of labour after it has begun. This necessitates a holistic strategy that includes a thorough diagnosis of the commencement of labour, ongoing monitoring, and prompt intervention. Longer labour has been linked to maternal infection, obstructed labour, PPH, and uterine rupture, all of which increase maternal and perinatal morbidity and may result in death. To avoid such sad circumstances, it has been a popular maxim to "not let the sun to set twice on a labouring woman." Despite the fact that the partograph has acquired a great amount of experience and information over the last 35 years, it is not widely used in poor nations, and there are huge gaps in available knowledge. There has been little published evidence of the partograph's actual implementation in primary health centres, where the majority of births occur and where many believe it may be a beneficial tool. [1]In today's world, both the obstetrician and the woman in labour would want that the delivery be completed in the quickest time feasible while maintaining the mother's and fetus's safety. As a result, the optimistic expectation has been replaced by aggressive labour control. Partogram may be utilised as a useful tool in this situation.

MATERIALS AND METHODS

A complete prospective workup of 100 patients admitted to MNR Medical College and Hospital during a two-year period, from December 2017 to November 2019, was conducted

in this research. After establishing that they met the necessary requirements, term primigravida patients were selected for the trial.

INCLUSION CRITERIA

Primigravida, Singleton pregnancy, term pregnancy in labour, cephalic presentation with vertex as the presenting component

EXCLUSION CRITERIA

Patients suffering from cephalopelvic disproportion, numerous pregnancies, malpresentations and malpositions, antepartum haemorrhage, and high-risk pregnancies.

After ascertaining that the patients met the aforementioned criteria and having confirmation signs of labour, the patient was routinely prepared and the following procedures were performed.

History, such as the patient's name and other necessary facts for establishing the patient's identification, as well as the patient's age.The patient's inpatient number and the obstetric unit to which he or she was admitted. entrance date and time to the ward and labour room The patient's main complaints upon admission. A comprehensive history of the current pregnancy, including if the patient is a scheduled or unscheduled case, whether she has been exposed to radiation or medications in the first trimester, whether she has had tetanus toxoid, and whether she has been on iron/calcium supplementing Obstetric status and history, which includes the length of her marriage, whether consanguineous or not. Menstrual history, including age of menarche, facts about her menstrual cycle, and her most recent menstrual period, is used by Naegle's formula to determine the estimated date of delivery. Any pertinent medical or surgical history, including TB exposure and diabetes mellitus and hypertension history. Any pertinent family history, such as a history of congenital anamolies, numerous pregnancies, diabetes, or hypertension. Personal history, including nutrition, appetite, sleep, and bladder and bowel motions.Inspection of the abdomen, fundal height, and abdominal girth in cm were all measured as part of the whole general and systemic examination.

The following points were observed after doing all of Leopold's grips. The fundal height corresponds to the gestational age. Whether or whether the outlet will accept four knuckles. It was determined that there was no cephalopelvic disproportion or a constricted pelvis.Urine analysis to determine volume, sugar, albumin, and ketones. During a contraction, all checks to assess cervical dilation and foetal position were performed. Because a reliable assessment of cervical dilatation is difficult to get with a flaccid cervix, it's generally ideal to measure dilation at all times throughout the height of a contraction. The same may be said for the foetal station. While this may be more unpleasant for the patient, the advantages in terms of relevant information may make it tolerable, particularly in situations when labour progression issues develop.All of the exams to assess dilatation and station were done by the author alone to eliminate interobserver variability.

Individuals have a tendency to make consistent errors, which means that they will often overestimate or underestimate cervical dilatation or foetal station by a predictable amount. This constantly allows a person to build a totally acceptable work routine if he or she does all of the exams alone. Throughout the length of labour, four hourly examinations were performed. Modifications were made, however, to accommodate for the quickly developing labour, particularly during the maximum slope of dilation, when exams were performed significantly more often.

A continuous partogram was generated by serially charting all pertinent observations on a partogram.

The modified WHO partogram was utilised in this research, which is comparable to Philpott and Castle's original description. In the phase, keep the action line 4 hours to the right of and

parallel to the alert line. The WHO guideline "A lag interval of four hours between a slowing of labour and the necessity for intervention is unlikely to harm the foetus or the mother and eliminates needless interventions" recommends a four-hour delay between alert and action lines.

The start of the recording, i.e. zero hour, was assumed to represent the patient's admittance time. Because the majority of the patients at this hospital were unable to pinpoint the start of regular uterine contractions, i.e. the start of labour. According to Philpott and Castle, this seems to be a concern in undeveloped counties.All of the patients' graphs were analysed and classified into one of three groups.

Group A – Patients who had birth before the partogram made contact with the alert line.

Group B – Patients who gave birth between the alert and action lines on the partogram.

Group C – Patients who gave birth after the action line had been crossed.

RESULTS

Table-1: Demographical details in present study

Age (In Years)	Number of Cases	Percentage
15-20	30	30
21-25	46	46
26-30	23	23
31-35	1	1
Total	100	100
Mean +SD	22.94+3.21	
Type of Labor		
Spontaneous	83	83
Induced	17	17
Mode of delivery		
FTNVD	72	72
Forceps	2	2
Vacuum	6	6
LSCS	20	20

The participants in this research ranged in age from 15 to 35 years old. There was a statistically significant difference in the frequencies of various age groups. There were the most patients in the age range of 21-25 years.

The chart shows that the majority of patients, 83 percent, experienced spontaneous commencement of labour and 17 percent were induced at term.

In the research group of 100 patients, 72 had full term normal vaginal birth, 2 cases had forceps assisted delivery, 6 cases had vacuum assisted delivery, 20 cases had LSCS, and 2 cases had LSCS. It was discovered that there was a statistically significant difference.

Table-2: Comparision of different variables on delivery

Type Of Labour	Mode of Delivery				Total	P-Value
	FTNVD	Forceps	Vacuum	LSCS		
Spontaneous	64	1	4	14	83	P = .077 (NS)
Induced	8	1	2	6	17	
Total	72	2	6	20	100	
Cervical Dilatation (in cm)						

0-3cm	47	2	4	14	67	P = 0.906 (NS)
>4cm	25	-	2	6	33	
Vertex at admission (station)	**72**	**2**	**6**	**20**	**100**	
-2,-1	58	-	6	20	84	P = 0.0034 (SIGNIFICANT)
0,+1	14	2	-	-	16	
	72	2	6	20	100	

There was no significant association between the type of labour and the manner of delivery in the above table, showing that the majority of the cases were spontaneous commencement of labour in all modalities of delivery.

In the table above, the result of labour was shown to be statistically non-significant in connection to cervical dilation upon admission. LSCS was performed on a higher percentage of patients with a 0-3cm cervical dilatation at the time of admission.

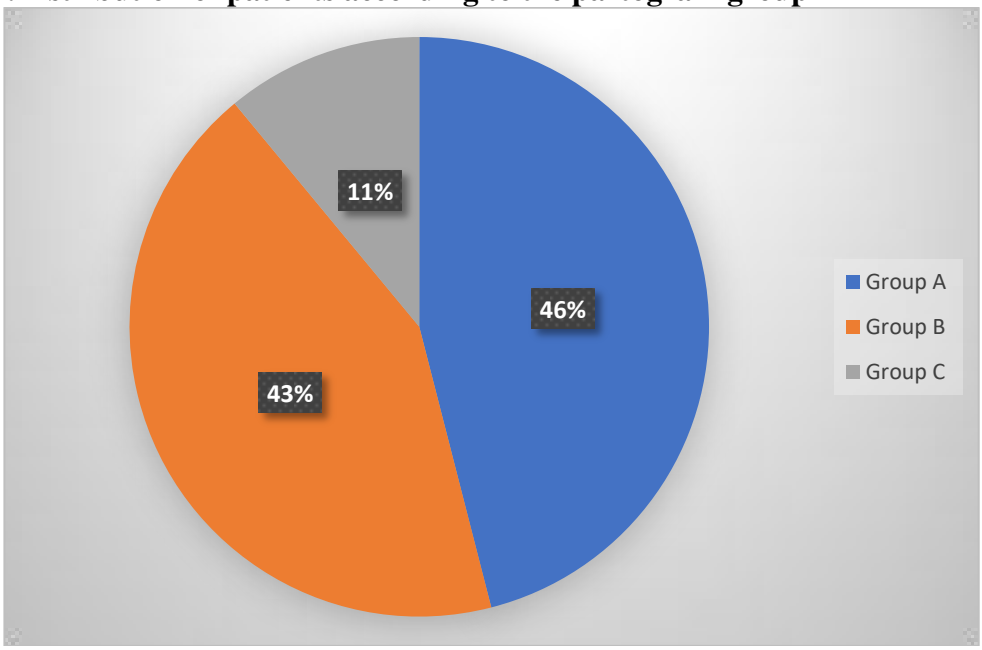
According to the table above, there is a strong link between the position of the head at entrance and the manner of delivery.

Table-3: Duration of labour in present study

Duration of Labour (In Hrs)	Number of Cases	Percentage	P-Value
0-4	4	4	P < 0.000 (HS)
5-8	52	52	
9-12	36	36	
>12	8	8	
Total	100	100	

Maximum number of patients 52 had a total duration of labour in between 5-8hrs, 36 cases had a duration of 9-12 hrs ,8 cases had duration of more than 12 hrs and only 4 cases had duration of labour in between 0-4 hrs.

Figure-1:Distribution of patients according to the partogram group



Group A – Patients who had birth before the partogram made contact with the Alert line.

Group B – Patients who gave birth between the Alert and Action lines on the partogram.Group C – Patients who had their babies after the Action line had been crossed.

Table-4: Outcome of labour in relation to the partogram pattern and birth weight

		Mode of delivery				
		FTNVD	Forceps	Vacuum	LSCS	Total
Partogram	A	45	-	1	-	46
	B	26	2	5	10	43
	C	1	-	-	10	11
Birthweight (in grams)	2000- 2599	12	1	2	-	15
	2600- 3000	42	1	3	6	52
	>3000	18	-	1	14	33

From the above table, statistically significant assosciation was found between birthweight and outcome of labour.

Table-5: Distribution of mode of delivery in relation to various abnormal labour patterns

Abnormal Labour Patterns	Mode Of Delivery			Total
	FTNVD	Instrumental Delivery	LSCS	
Failure of Descent	-	-	1	1
Arrest of Descent	-	2	1	3
Protracted Descent	5	6	3	14
Arrest of Dilatation	-	-	2	2
Protracted Dilatation	8	-	4	12
Total	13	8	11	32

Protracted dilatation was seen in 12 cases out of which 8 had FTNVD and 4 underwent LSCS.Arrest of dilatation was seen in 2 cases both of which underwent LSCS.Protracted descent was seen in 14 cases of which 5 had FTNVD,6 had instrumental deliveries and 3 had LSCS.Arrest of descent was seen in 3 cases of which 2 had instrumental deliveries and 1 underwent LSCS.Failure of descent was seen in 1 case which underwent LSCS.

Fetal Distress was seen among 3 cases 2 spontaneous and 1 induced.Meconium staining of liquor was seen among 6 cases out of which 2 were spontaneous and 4 induced.Abnormal labour patterns were seen among 11 cases 10 spontaneous and 1 induced.

Table-6: APGAR score at 1 and 5 minutes in present study

Babies	Number of cases	P-Value
Term	98	P < .00001 (HS).
SGA	2	
APGAR (I min)		
0-3	3	P < .00001 (HS)
4-6	13	
7-8	84	
APGAR (at 5 minutes)		
0-3	1	P < .00001 (HS)
4-6	2	
7-8	24	
9-10	73	

Significant assosciation was found for maximum number of cases – 98 being term and least for SGA babies i.e.,2. Maximum number of babies(84) had APGAR between 7-8 at 1 minute and least number i.e., 3 babies had APGAR between 0-3.
From the above table, statistically significant assosciation was found. Maximum number of babies(73) had APGAR between 9-10 at 5 minute and least number i.e., 1 baby had APGAR between 0-3. From the above table, statistically significant assosciation was found.Maximum number of cases (83) had no complications.

Table-7:Neonatal and maternal complications in study

Neonatal Complications	**Number Of Cases**	**P-Value**
Nil	83	
Birth Asphyxia	7	
Neonatal Jaundice	8	P < .00001 (Hs)
Sga	2	
Total	100	
Maternal Complications		
Nil	89	
UTI	5	P < .00001 (Hs)
Retained Placenta	1	
Fever	3	
3rd Degree Perineal Tear	2	
Total	100	

From the above table, statistically significant assosciation was found.Maximum number of cases (89) had no complications.
Birth Asphyxia was seen in 7 cases out of which 6 were delivered by LSCS and 1 by forceps delivery. Neonatal jaundice was seen among 8 neonates out of which 4 were delivered by FTNVD and 4 through LSCS.SGA 2 cases were seen.

DISCUSSION

The participants in this research ranged in age from 15 to 35 years old. The average age of the participants in this research is 22.94 years. FTND was found in 78.85 percent of the Phipott and Castle series participants, 15.55 percent had outlet forceps or vacuum delivery, and 2.6 percent had LSCS. [2]FTND was found in 68 percent of the Daftary and Mhatre series, whereas 14 percent needed outlet forceps/vacuum and 7.5 percent required LSCS. [3]According to the WHO research, 78.3 percent of people had FTND, whereas 4.2 percent needed exit forceps, 10.5 percent needed vacuum, and 6.9 percent needed LSCS. [4]According to Laurence Impey et al, 75.4 percent of patients had FTND, 19.2 percent needed exit forceps / vacuum, and 5.4 percent needed LSCS. [5]In this research, 72 percent of the participants had FTND, 2 percent needed exit forceps, 6% needed vacuum delivery, and 20% needed LSCS. Except for LSCS, the current study coincides with all other investigations. In comparison to prior investigations, the rate of LSCS has increased. The outcome of labour as it relates to cervical dilation at the time of admission (Comparative study)
All of the patients in this research had cervical dilatation of 2 to 3 cm at the time of admission. In the Paul Holmes et al. [6] research, 63 percent of FTNDs had a dilatation of 2-3 cm, 26.6 percent had exit forceps / vaccum, and 10.6 percent had LSCS. 70% of the patients in this research had FTNDs, 9% had outlet / vacuum, and 21% had LSCS at a cervical dilation of 0-3 cms.At > 4 cms cervical dilation, 70% of patients received FTND, 25%

received exit forceps / vacuum, and 4.2 percent received LSCS, according to Paul Holmes [6]. At > 4 cms cervical dilatation, 75.7 percent of patients had FTNDs, 6.1 percent had exit forceps / vacuum, and 18.2 percent had LSCS. In terms of FTNVDS, the current study correlated with Paul Holmes' research.

The length of the first stage of labour in the current research was 8.08 hours, compared to 7.4 hours by John Fr. Barette [7] and 5.4 2.53 hours by Steer et al. 43,44 In this research, the second stage of labour lasted 55.56 minutes, compared to 32.4 minutes for John Fr. Barett and 46.37 minutes for P.J. Steer et al. The findings of this investigation are consistent with those of John FR Barett. [7]

Table-8:Distribution of patients according to the partogram pattern comparative study.

Partogrm group	Philpott and castle et.al [2]	Daftary and mhatre [3]	Sharmin et al. [8]	Ernest orji et al. [9]	Lakshmi devi et al. [10]	Sanyal et al. [11]	Present study
A	78%	66%	68.5%	55.1%	66.5%	80.8%	46%
B	11%	25.5%	27%	27.9%	20%	15.2%	43%
C	11%	8.5%	4.5%	16.9%	13.5%	4%	11%

On comparison of the present study with the other studies the following was noted.

According to the Philpott and Castle [2] series, 78 percent of the patients were assigned to group A, 11 percent to group B, and 11 percent to group C.66 percent of patients in the Daftary and Mhatre [3] series were in group A, 25.5 percent of patients were in group B, and 8.5 percent of patients were in group C.Sharminet.al [8] found that 68.5 percent of cases were in group A, 27 percent in group B, and 4.5 percent in group C in their research. According to Ernest Orji et al. [9]research, 55.1 percent of people were in Group A, 27.9% in Group B, and 16.9% in Group C.In a research by Lakshmi Devi et al. [10], 66.5 percent of the participants were in group A, 20% in group B, and 13.5 percent in group C. Sanyal et al.[11] found that 80.8 percent were in group A, 15.2 percent were in group B, and 4% were in group C in their research. In the current research, 46% of patients were assigned to group A. A total of 43% of patients were in group B, whereas 11% of patients were in group C.The current research contradicts the findings of the previous investigations. In the Philpot and Castle series [2], patients in Group A had an FTND in 89.76 percent of cases, 9.8 percent needed forceps/vacuum, and 0.4 percent required LSCS. In group B, 79.41% of patients had FTND, 20.95 percent needed forceps or vacuum delivery, and only a few patients required LSCS.There was no FTND in group C, and all of the patients needed surgical surgery. In group A, 85.61 percent of the Daftary and Mhatre [3] series had FTND, 6.06 percent needed forceps or vacuum delivery, and 2.27 percent required LSCS. 43.14 percent of those in group B had FTND, 33.33 percent needed forceps or vacuum, and 3.93 percent needed LSCS. 5.88 percent of those in Group C developed FTNDs, and 76.48 percent needed surgery. When the result of labour was compared to the partogram pattern in this research, it was discovered that the majority of patients in group A had FTND (97.8% with no LSCS) and just 2.2 percent had instrumental births.The majority of patients in group B, 60.5 percent, had FTNDs with active labour management, 23.3 percent had LSCS, and 16.2 percent had instrumental births. While the bulk of patterns in group C patients, 91 percent, had LSCS, with just 9% having FTNDs. This demonstrates that by charting a Partogram and watching its progression visually, it is feasible to forecast the probable result of labour with a good degree of accuracy. As a result, a patient in group A had a considerable chance of having a spontaneous vaginal birth. Even while group B patients had a high rate of FTND with relatively few LSCS, they all needed intense monitoring and active labour management.

Shirish N Daftary and Parvin N Mhatre investigated the course of labour in 200 primi gravidae using partograms. [3] They found that partogram was very useful in the treatment of Primigravida labour because it allowed for early diagnosis of dystocia and interference. In a research done in Maharashtra, the emergency caesarean section rate was lowered from 44 percent in the control group to 21 percent in the experimental group, indicating a substantial reduction in protracted labour. Newborn critical care admissions fell from 17% in the control group to 6% in the study group, showing better maternal and neonatal outcomes. [12]

32 of the 100 individuals in this research showed atypical labour patterns. In one example when LSCS was performed, there was a failure of descent. Three incidences of arrest of descent were seen, with two cases requiring instrumental delivery and one requiring LSCS. In 14 instances, prolonged descent was seen, with 5 cases undergoing FTNVD, 6 cases having instrumental deliveries, and 3 cases having LSCS. In two of the instances when LSCS was performed, there was a stoppage of dilation. Prolonged dilatation was seen in 12 instances, 8 of which had FTNVD and 4 of which had LSCS. These aberrant labours were recognised sooner and prompt intervention was performed thanks to the use of partogram.At 1 minute, 84 percent of newborns in the current research had an APGAR of 7-8, compared to 7-8 in 22 percent and 9-10 in 78 percent in Goyal et al. [13] At 5 minutes, 97 percent of newborns had an APGAR score of 7-10, compared to 94 percent for Beher et al, while APAGR of 0-3 was seen in 1% of neonates, compared to 1% for Beher et al. [14].In the current trial, 83 percent of participants experienced no problems, compared to 86.5 percent in the RB Behere study. Birth asphyxia was identified in 7% of newborns, compared to 6% in Behere's study, while neonatal jaundice was found in 8% of babies, compared to 5.5 percent in Behere's study. In this trial, there were no neonatal infections, while RB Behere had 2%. In both investigations, there were no newborn fatalities.The current study is in line with R.B. Behere's research.

As a result, managing patients with partograms with the three zones improves the quality and consistency of observations of the mother and foetus, and acts as a "Early warning system" for the detection of abnormal progress, allowing for early referral, intervention, or termination of labour, thus improving maternal and foetal outcomes. As a result, all patients in labour should be managed using the partogram with three zones.

CONCLUSION

The regular use of the partogram, as shown in this and prior research, is beneficial in detecting anomalies in the course of labour and allows for early remedial treatment. The identification of problems in labour progression, especially by observing the emergence of typical patterns of cervical dilatation and foetal descent, is crucial for early diagnosis. The use of the partogram has also aided in the implementation of the active management of labour policy, which ensures that the patient is delivered within twelve hours.

Aside from that, the following benefits of the partogram have been noted: It's a low-cost, easy-to-use bedside clinical approach. It is effective and saves time. It is sensitive as well as particular. The graphical portrayal of the course of labour provides a more accurate image of what to expect during labour. It allows for fair assurance in anticipating labour issues and signals the need for clinical re-evaluation. It also indicates instances that may need rigorous intrapartum surveillance and potential surgical or non-operative intervention. On a single page of paper, the complete course of labour is documented in detail. A continuous partogram is essential in the identification of aberrant uterine activity, and although clinical judgement may be used to determine the need for intervention, the partogram more clearly specifies the time to intervene. The partogram allows the obstetrician to evaluate the effectiveness of any therapeutic methods that he or she may choose to undertake. The partogram serves as a solid foundation for education, particularly for staff nurses, house surgeons, and medical students. It is especially useful during the transfer of the patient from

doctor to doctor since it provides a snapshot of the labour development at a glance. The partogram does not need any complicated technology to be efficient and successful.
The partogram gives doctors a complete picture of the difficulties and solutions associated with labour documentation and management. Clinicians may analyse the transferability of these results to their own units, taking into account their unique context and practises. These results also suggest crucial concerns for the creation of new labour monitoring tools, such as the streamlined effective labour monitoring to action tool. The partogram may be kept as a permanent record of the labour and delivery. As a result, the incidence of perinatal death has decreased. As a result, the relevance of the partogram in labour management cannot be overstated.

REFERENCES

1. Drowin B, Nasah BT, N Kounawa F. The value of the partograph in management of labour. Obstet and Gynecol 1979; 5396) : 741-5
2. Philpott RH, Castle WM. Cervicographs in the management of labour in Primigravidas. Br J Obstet and Gynaecol 1972; 79 : 599.
3. Daftary S, Mhatre P. Cervicographs in the management of labour in primigravidae. J of Obstet and Gynaecol of India 1977; 27: 687 – 691.
4. WHO. Partograph in the management of labour lancet 1994 ; 343 : 1399-1403
5. Lawrence Impey, Jonathan Hobson, Coln O' Herliby. Graphic analysis of actively managed labor: Prospective computation of labor progress in 500 consecutive nulliparous women in spontaneous labour at term. Am J of Obstet and Gynaecol 2000; 183:438-442.
6. Paul Holmes, Lawrence WO, Shi Wu Wen. The relationship between cervical dilatation at initial presentation in labour and subsequent intervention. Br J of obstet and Gynaecol 2001 ; 108 : 1120 – 1124.
7. Barrett JF, Savage J, Philips K.A randomized trial of amniotomy in labour versus intention to membrane intact until second stage. BrJ of obstet and Gynaecol 1992; 1:5–9.
8. Sharmin S, Rashid M, Hazra SC, Khondker L. Implementation of partograph and its effect on outcome of spontaneous labour at term. Bangladesh Med J. 2012; 41(1) : 42 – 4.
9. Orji E. Evaluating progress of labor in nullipara and multiparas using the modified WHO partograph. IntJ.Gynaecolobstet .2008 ; 102 (3) : 249 – 52.
10. Lakshmi Devi Muralidhar, Malini KV. Partographic analysis of spontaneous labour at term in primigravida ; Shetty Vishma . J ObstetGynaecol India 2012 Nov – Dec., 62 (6) : 635 – 40.
11. Sanyal U, Goswami S, Mukhopadhyay P. The role of partograph in the outcome of spontaneous labour. NJOG .2014 Jan – June; 17 (1) : 52 – 7.
12. SurekhaTayade, Pooja Jadhao. The impact of use of WHO patograph on maternal and perinatal outcome. International Journal of Biomedical and Advanced research 2012 ; Vol (3) : 394 – 398.
13. GoyalLatika, Kapoor M, Agarwal U, Agarwal AK. Partographic study of active management of labour in relation of foetal outcome.J of obstet and Gynaecol 1990 ; 41 ; 174 – 181.
14. Behera RB, Shivastava AK. Active management of labour in primigravida - A Prospective study. J of Obstet and Gynaecol of India 1995 ;59 : 704 – 710