

DOI: <https://dx.doi.org/10.18203/2320-1770.ijrcog20211512>

Original Research Article

Partographic analysis of labour by modified WHO partograph in tertiary care centre

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Received: 19 February 2021

Revised: 01 April 2021

Accepted: 03 April 2021

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ABSTRACT

Background: The partograph is a simple, inexpensive tool to provide a continuous pictorial overview of labor. The goal of this study is to use partograph to monitor labor, initiate uterine activity that is sufficient to produce cervical changes, fetal descent while avoiding uterine hyperstimulation, hypostimulation and fetal distress and provide timely surgical intervention where required.

Methods: A hospital-based observational study involving prospective review of partographs for births that occurred in 2020 was conducted in 2 hospitals including SVP Hospital and V.S hospital Ahmedabad. A partographic analysis of labour was done in randomly selected 200 patients using modified WHO partogram. The study population was divided into Primigravida (96) and Multigravida (104) term patients. partograph recording were commenced at 4 cm dilatation. close maternal and fetal monitoring was done throughout the labour and partogram was plotted to detect any deviation from normal course.

Results: Patients were grouped into primigravida and multigravida and based on partogram finding divided into mode of delivery. 22 of total 96 primigravida underwent caesarean section and 74 delivered vaginally. 8 of total 104 multigravida underwent caesarean section and 96 delivered vaginally. Out of 200 newborn only 11 had Apgar score <7 at 5 minutes.

Conclusion: The WHO modified partograph is highly effective in reducing both maternal and neonatal morbidity. It aids in assessing the progress of labour and to identify when intervention is necessary. It is effective in preventing prolonged labour, obstructed labour, reducing operative intervention and improving neonatal outcome.

Keywords: Documentation, Obstructed labour, Partograph

INTRODUCTION

The partograph has been established as the “gold standard” for labor monitoring. It has been recommended by the World Health Organization (WHO) for monitoring in active labour.¹ Partograph is tool for monitoring maternal and fetal wellbeing during active phase of labor and a decision making aid when abnormalities are detected. The partograph was designed by Friedman in 1954 and further improved by Philpot and Castle who introduced the alert and actions lines to facilitate interventions during labour.² Partograph helps to identify obstructed labour or prolonged labor and to know when to

take appropriate actions to avoid complications. partograph is a useful tool in making early decisions to transfer patient to higher centre when labour is not progressing normally hence it is used in peripheries. Advantage of partograph in active management of labour is the timing of interventions such as amniotomy, augmentation with oxytocin, caesarean section or transfer to higher centre. Partograph is a useful tool for timing such interventions.²

The partograph is an “easy-to-use” tool, but if not used correctly it can affect the final outcome in beneficial way for both mother and newborn. Partograph is an important

tool for managing labour. This is through health care providers to record their examination findings on a standardized form, which generates a pictorial overview of labour progress and maternal and fetal condition, which allows for early identification of abnormal labour.³

Obstructed labour is a leading cause of maternal and neonatal mortality, especially in developing countries.^{4,6} Globally, it is estimated that obstructed labour occurs in 5% of pregnancies and accounts for an estimated 8% of maternal deaths.⁷⁻⁹ Obstructed labour may result in serious complications such as obstetric fistula, uterine rupture, puerperal sepsis and postpartum haemorrhage.^{10,11}

In this study, we aim to assess the role of partograph in the analysis of outcome of labor at term with singleton pregnancy with vertex presentation.

Design of WHO partograph

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.^{12,13} This partograph is based on the principle that during active labour, the rate of cervical dilatation 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. 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.¹⁴

METHODS

The present study is a prospective observational study conducted at the Obstetrics and Gynaecology Department of Smt. NHL Municipal Medical College and its affiliated hospitals, from 20th May, 2020 to 25th December, 2020. Study involved randomly selected 200 women who came in labour room with labour pain and admitted.

On admission to labour room, for each patient, a detailed history was taken, and a thorough examination was done with particular reference to the points as per proforma. General examination of patient was carried out including height, weight, pulse, BP. They were examined for presence of pallor, oedema, icterus and fever. Thorough examination of CVS and RS was done to rule out any kind of systemic diseases. Per abdomen examination was carried out by Leopold's manoeuvres. Height of uterus, fullness of flanks was noted. Lie, presentation and

position of the foetus were confirmed. Amount of liquor was noted.

Part of head palpable in fifths was noted. Duration, intensity and frequency (per 10 minutes) of uterine contractions were noted. Vaginal examination under all aseptic precautions performed to note position of cervix, consistency of cervix, cervical dilatation in cm, effacement of cervix, presence of membranes, station of presenting part, position of occiput. Detailed pelvic assessment was done to rule out obvious CPD. All above findings were recorded on partogram.

The goal of this study is to use partograph to monitor labour, initiate uterine activity that is sufficient to produce cervical change and fetal descent while avoiding uterine hyper stimulation, hypo stimulation and fetal distress and provide timely surgical intervention where required.

The objectives of the current study are to compare the partograph of primigravida and multigravida, to study the significance of alert line in partograph and to study the effect of partograph in relation to labour outcome in terms of its Mode of delivery and Neonatal- Apgar score and need of resuscitation.

Inclusion criteria

Single live foetus, Gestational age >37 weeks, Cephalic presentation, clinically adequate pelvis.

Exclusion criteria

Pregnancy with intrauterine demise, Malpresentation Previous scarred uterus, Multifetal pregnancy, Antepartum hemorrhage, Patient who were planned elective caesarean section.

Study design

The labour details were plotted using WHO modified partograph as soon as the woman enters into active phase of labour i.e 4cm dilatation with good uterine contractions. In active phase of labour P/V examination was done at 4 hours interval and fetal heart was monitored at 1-hour interval.

If cervical dilatation had progressed on left to alert line, the labour was considered to progress normally. But if it had moved to right of alert line, after confirming fetal well-being and excluding gross CPD, augmentation was done.

Rupture of membranes was done if they were present. oxytocin augmentation was done if uterine inertia was noted. Further progress was seen until delivery. If labour progress was satisfactory, labour was allowed to continue.

Active management of third stage of labour done in all patients. If obstruction or fetal distress was diagnosed at any time CS was done. Baby's APGAR noted at 5 minutes.

Statistical analysis

Data was analysed and descriptive statistics were presented as frequency and percentage.

RESULTS

In this study 200 patients in active labour at term were analysed using WHO modified partograph. Out of 200 patients 96 were primigravida and 104 were multigravida.

Most of the patients included in study were had gestational age of 38-41 weeks (Table 1) and majority of them are in 21-30 years of age group.

According to basic maternal parameters of labor, 154 patients had spontaneous labor and 46 required induction.

154 women went into spontaneous labour, induction required only in 26 patients. membranes were present in

166 patients and were absent in 34 women. Augmentation done with oxytocin in patients (Table 3).

Out of 200 women 80 (40%) delivered after crossing alert line and 14 (7%) delivered after crossing action line.

Table 1: Background parameters of studied subjects.

Variable	Group	Frequency (200)	Percentage
Age	<20 year	20	10
	21-25 year	102	51
	26-30 year	74	37
	>30 year	4	2
Weight	<50 kg	12	6
	51-60 kg	76	38
	>60 kg	112	56
Height	<150cm	6	3
	150-155 cm	124	62
	>156 cm	70	35
Gestational age	37-38 wk	72	36
	39-40wk	108	54
	>40 wk	20	10

Table 2: Distribution of patients according to basic maternal parameters of labor.

		Primi (96)	Multigravida (104)	Total
Labor onset	Spontaneous	72 (75%)	82 (78.8%)	154
	Induced	24 (25%)	22 (21.1%)	46
Status of membrane	Present	85 (85.54%)	81 (77.88%)	166
	Absent	11 (11.45%)	23 (22.11%)	34

Table 3: Distribution of patients according to intervention.

Intervention		Primi(96)	Multigravida (104)	Total
Induction	Done	24 (25%)	22 (21.15%)	46
	Not done	72 (75%)	82 (78.84%)	154
Augmentation	Done	44 (45.83%)	53 (50.96%)	97
	Not done	52 (54.16%)	51 (49.03%)	103

Table 4: Distribution of patients according to alert line and action line before delivery.

Partogram findings		Primi (96)	Multigravida (104)	Total
Crossed alert line	Yes	42 (43.75%)	38 (36.53%)	80 (40%)
	No	54 (56.25%)	66 (63.46%)	120 (60%)
Crossed action line	Yes	9 (9.37%)	5 (4.8%)	14 (7%)
	No	87 (90.62%)	99 (95.19%)	186 (93%)

Table 5: Maternal Outcome in terms of mode of delivery according to alert line.

Mode of delivery		Before alert line	After alert line	After action line
Vaginal delivery		117	53	0
Caesarean section		3	13	14
Indication of caesarean	Fetal distress	3	4	0
	Obstruction	0	2	0
	Non progress of labor	0	7	14

A total of 3 patients undergone c-section before alert line due to fetal distress. 53 out of 66 patients who crossed alert line delivered vaginally and 13 undergone c-section. 14 patients crossed action line and undergone c-section due to Non progress of labor.

Table 6: Mode of delivery in primi and multigravida.

Mode of delivery	Primi (96)	Multigravida (104)	Total
Vaginal delivery	74 (77.08%)	96 (92.30%)	170 (85%)
Caesarean section	22 (22.91%)	8 (7.69%)	30 (15%)

Out of 96 primigravida 74 delivered vaginally and 22 by Caesarean section while out of 104 multigravida 96 delivered by vaginal route and 8 by Caesarean section. Caesarean section rate was higher in primigravida (22.91%) then multigravida (7.69%).

Table 7: Fetal outcome on the basis of alert line and action line in terms of Apgar score.

	Apgar Score	
	>7	<7
Patients does not crossed alert line (120)	114 (95%)	6 (5%)
Patients crossed alert line but not crossed action line (66)	63 (95.45%)	3 (4.54%)
Patients crossed action line (14)	12 (85.71%)	2 (14.28%)

Out of 200 newborn only 11 had Apgar score < 7 at 5 minutes. 2 newborn out of 14 who crossed action line had Apgar score <7.

DISCUSSION

In this prospective study, 200 term patients in labour were analysed by modified WHO partogram and its effects on maternal and neonatal outcome were studied. In our study 80 (40%) out of 200 patients crossed the alert line, out of them 42/80 (52.5%) were primi and 38/80 (47.5%) were multigravida. In WHO study 34.5% primi and 21% Multigravida crossed the alert line.¹⁵ In Philpotts, study 11% crossed the action line, while in our study 14 (7%) out of 200 crossed the action line 9 were primigravida and 5 were multigravida.¹⁶ In WHO study 9.9% patients crossed the action line while in our study significantly fewer patients (7%) crossed the action line similar to levander et al study (5.3%).^{15,17} In present study, induction of labour was done in 46 (23%) out of 200 patients, more induction was required in primi patients (25%) then multigravida (21.15%). Out of 200 patients 166 (83%) had membrane present at the time of admission and 34 (17%) patients presented with absent membranes, there was no difference on the progress of

labour in patients who came with absent membranes and intact membranes. No significant difference was found in patients crossing alert line and in who's who did not cross the alert line with regards of maternal age, height, weight, gestational age, baby weight. With our management protocol there was no difference in Apgar score at 5min whether patient crossed or did not cross the alert line or action line.

In our study 170 (85%) patients delivered vaginally, out of this 117 delivered before alert line. CS was done more frequently in primigravida 22 (22.91%) as compared to multigravida 8 (7.69%) while in Frigotto et al 78.3% and in Pattison et al study 63.66% patients delivered vaginally.^{18,19}

As this study was conducted in tertiary care centre where health care providers routinely use partograph for labor monitoring, our results cannot be generalised because it is more useful in primary care centres and peripheries for early identification and referral to higher centre. The charting of partograph requires periodic vaginal examinations that is uncomfortable for patients and also maybe inadequate and poorly timed in busy labor room. Many women progressed faster than was anticipated and many women took time despite adequate stimulations to progress but eventually delivered without consequences for the mother or the child.

CONCLUSION

The WHO modified partogram is highly effective in reducing both maternal and neonatal morbidity. It aids in assessing the progress of labour and to identify when intervention is necessary. It is effective in preventing prolonged labour, obstructed labour, reducing operative intervention and improving neonatal outcome. It reduces unnecessary strain on mothers by reducing total duration of labour, without any increased foetal morbidity and mortality. If accepted as routine procedure, it will be suitable in all situations where the labour room remains busy and congested day and night. Thus, it seems that the value of active management of labour will be realized by most of the obstetricians and it will be accepted as a routine procedure for better and more efficient management of labour. The only disadvantage is that 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.

Funding: No funding sources

Conflict of interest: None declared

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

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Cite this article as: Jain P, Shah CA, Patel SB, Jani KS. Partographic analysis of labour by modified WHO partograph in tertiary care centre. *Int J Reprod Contracept Obstet Gynecol* 2021;10:1920-4.