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Original Research Article

Analysis of labour by modified WHO partograph in primigravida and multigravida term patients: an observational study

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ABSTRACT

Background: The World Health Organization (WHO) recommends the use of a partograph to follow labor and delivery, with the aim of improving health care and reducing maternal and foetal mortality. The partograph is a graphic representation of events of labour and is an effective visual resource for early detection of abnormal progress of labour and prevention of prolonged labour. The aim of this study is to use partograph to monitor labor, analyse cervical effacement and dilatation, uterine contraction, foetal presentation while avoiding uterine hypo-stimulation, hyperstimulation and reducing the risk of sepsis, obstructed labor or postpartum haemorrhage (PPH).
Methods: This was a single year hospital-based observational study conducted in 2021 of the deliveries in Sardar Vallabhbhai Patel Institute of Medical Sciences and Research (SVPIMSR) and Sheth V.S General Hospital, Ahmedabad. Analysis of labor of 60 randomly selected patients was done using WHO modified partograph. The patients were classified as primigravida and multigravida. The partograph recording started at 4cm dilatation, continuous maternal and foetal monitoring was ensured throughout the labor and partogram was plotted against time in hours. Any deviations from the normal course were recorded.
Results: In this observational study, 60 patients were analysed. They were classified into primigravida and multigravida and based on the recordings from partograph further classified into mode of delivery. 3 out of 26 primigravida and 1 out of 34 multigravida patients underwent caesarean deliveries. 25 patients crossed the alert line and 4 patients crossed the action line. 5 deliveries out of 60 had APGAR score of <7 at 5 minutes.
Conclusions: The WHO modified partograph is highly effective in reducing both maternal and neonatal morbidity. It is an excellent visual resource to analyse cervical effacement and dilatation, uterine contraction and foetal presentation in relation to time. It is effective in early detection of abnormal progress of labor, prevention of prolonged labor, obstructed labor, PPH and improvement in neonatal outcome.

Keywords: Partograph, Primigravida, Multigravida, Maternal monitoring, Foetal monitoring

INTRODUCTION

A partogram is a graphical presentation of a woman's progress of labour. The partogram was designed by Philpott in 1971 in Harare, Zimbabwe.[1] 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.[2] Partogram is an important tool for managing labour. This enables midwives, nurses and doctors to record their examination findings on a standardized form, which generates a pictorial overview of labour progress and maternal and foetal condition, which allows for early identification and diagnosis of pathological labour.[3] 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.[4]

Partograms have three distinct sections where observations related to maternal condition, fetal condition and labour progress are recorded. Cochrane database review done in 2009 has recommended the use of partogram curve in developing countries because of poor access to health care resources. Hence it is a useful tool in making early decisions to transfer patient from periphery to higher centre when labour is not progressing normally. The crucial factor in active management of labour is the timing of interventions such as amniotomy, augmentation with oxytocin, caesarean section or transfer to higher centre. Partogram is a useful tool for timing such interventions.[4]

Obstructed labour is a leading cause of maternal and neonatal mortality, especially in developing countries.[5-7] Globally, it is estimated that obstructed labour occurs in 5% of pregnancies and accounts for an estimated 8% of maternal deaths.[8-10] Obstructed labour may result in serious complications such as obstetric fistula, uterine rupture, puerperal sepsis and postpartum haemorrhage.[11-12]

The objective of this study is to record the role of partograph in the analysis of labor and the corresponding neonatal outcome in singleton pregnancy with vertex presentation.

METHODS

A prospective observational study conducted at the Obstetrics and Gynaecology Department of Smt. NHL Municipal Medical College and its affiliated hospitals, from May, 2021 to December, 2021. 60 patients were selected on a random basis for the study, provided that they fulfilled the inclusion criteria.

Upon admission into labor room, a thorough examination of each patient was carried out. A detailed history was recorded and examination was carried out with reference to points as per proforma. They were checked for oedema, pallor, fever and icterus. Overall general physical as well as systemic examination was done to rule out systemic diseases. Abdomen was examined using Leopold's manoeuvres, fullness of flanks, height of uterus, position of foetus was confirmed, alongwith continuous monitoring of foetal heart-rate patterns with stethoscope and NST.

Inclusion criteria

Singleton pregnancy, term (>37 weeks), cephalic presentation, clinically adequate pelvis.

Exclusion criteria

Severe PIH, diabetes, anaemia, previously scarred uterus, multifetal pregnancy, elective caesarean section.

The labour details were plotted using WHO modified partograph as soon as the woman entered into active phase of labour i.e 4 cm 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 be progressing 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 was done in all patients. If obstruction or fetal distress was diagnosed at any time CS was done. Baby's APGAR was noted at 5 minutes. The study group was classified into primigravida and multigravida.

Statistical analysis

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

RESULTS

26 primigravida and 34 multigravida term patients were analysed and the labor was plotted using WHO modified partogram. Majority of the patients were in the gestational age of 38-40 weeks and in the age group of 21-25 (Table 1).

Table 1: Background information of studied subjects.

Variable	Group	Frequency (60)	%
Age (years)	<20	6	10
	21-25	32	53.3
	26-30	19	31.7
	>30	3	5
Weight (kg)	<50	4	6.7
	51-60	24	40
	>60	32	53.3
Height (cm)	<150	6	10
	150-155	46	76.7
	>156	8	13.3
Gestational age (weeks)	37-38	16	26.7
	39-40	42	70
	>40	2	3.3

Out of 60 patients, 47 had spontaneous labor onset and 13 patients required induction. 49 of the 60 patients had membrane present at the time of admission (Table 2).

Oxytocin augmentation was performed in 29 patients out of which 11 were primigravida and 18 were multigravida (Table 3).

25 (41.7%) patients crossed the alert line out of which 11 were primigravida and 14 were multigravida. 4 (6.7%) patients crossed the action line out of which 2 were primigravida and 2 were multigravida (Table 4).

Table 2: Patients distribution across maternal parameters of labor.

	Group	Primigravida (26)	Multigravida (34)	Total
Labor Onset	Spontaneous	20 (76.9%)	27 (79.4%)	47
	Induced	6 (23.1%)	7 (20.6%)	13
Status of membrane	Present	19 (73.1%)	30 (88.2%)	49
	Absent	7 (26.9%)	4 (11.8%)	11

Table 3: Patients distribution based on intervention.

Intervention	Group	Primigravida	Multigravida	Total
Induction	Done	6 (23.1%)	7 (20.6%)	13
	Not done	20 (76.9%)	27 (79.4%)	47
Augmentation	Done	11 (42.3%)	18 (52.9%)	29
	Not done	15 (57.7%)	16 (47.1%)	31

Table 4: Patients distribution based on alert line and action line before delivery.

Partogram	Group	Primigravida	Multigravida	Total
Crossed alert line	Yes	11 (42.3%)	14 (41.2%)	25 (41.7%)
	No	15 (57.7%)	20 (58.5%)	35 (58.3%)
Crossed action line	Yes	2 (7.7%)	2 (5.9%)	4 (6.7%)
	No	24 (92.3%)	32 (94.1%)	56 (93.3%)

Table 5: Classification of maternal outcomes in mode of delivery according to action line.

Mode of delivery		Before alert line	After alert line	After action line
Vaginal delivery		34	21	1
caesarean delivery		1	0	3
Indication of caesarean	Foetal distress	1	0	0
	Obstruction	0	0	1
	Non progress of labor	0	0	2

Table 6: Mode of delivery across primigravida and multigravida.

Mode of delivery	Primigravida	Multigravida	Total
Vaginal delivery	23 (88.5%)	33 (97%)	56
Caesarean delivery	3 (11.5%)	1 (3%)	4

1 patient underwent c-section before alert line due to foetal distress and 34 patients delivered vaginally before alert line. In the study, indications of LSCS after action line was crossed were obstruction and non-progress of labor. 21 patients delivered vaginally after alert line and 1 after action line (Table 5).

Table 7: Patient distribution based of duration of premature rupture of membranes and their mode of delivery.

	Time period	Caesarean delivery	Vaginal delivery
Primigravida	<12 hours	0	4
	>12 hours	3	0
Multigravida	<12 hours	0	3
	>12 hours	0	1

In our study, 3 (11.5%) primigravida patients underwent c-section and 1 (3%) multigravida patient underwent c-section. It was observed that caesarean section was higher in primigravida patients (Table 6).

3 Out of 7 primigravida underwent C-section after more than 12 hours of premature rupture of membranes; while

none of the multigravida underwent c-section after premature rupture of membranes (Table 7).

Table 8: Classification of foetal outcome based on APGAR score and action line.

	APGAR Score	
	>7	<7
Patients did not cross alert line (39)	34 (97.1%)	1 (2.9%)
Patients crossed alert line (17)	22 (88%)	3 (12%)
Patients crossed action line (4)	3 (75%)	1 (25%)

Another thing to note is that 5 (8.3%) patients recorded the APGAR score less than 7 (Table 8).

DISCUSSION

Although in majority of cases, labour is a natural phenomenon occurring spontaneously, a few tend to become dystocic and result in prolonged labour. Hence it is essential to detect them and deliver by appropriate intervention.[13] Partogram's use is critical in preventing maternal and perinatal morbidity and mortality and therefore has applicability in developed and developing world settings.[4]

In our prospective observational study, partographic analysis of 60 term patients' labor was performed using WHO modified partogram and the resulting maternal and neonatal outcome were studied. We recorded that 25 out of 60 patients crossed the alert line constituting 11 (44%) primigravida and 14 (56%) multigravida patients. In WHO study 34.5% primigravida and 21% multigravida patients crossed the alert line.[14] Philpott's study recorded 11% patients which crossed the action line and in comparison, 6.7% patients crossed the action line in our study.[15] We also recorded that the percentage of primigravida (23.1%) patients requiring induction was higher than multigravida (20.6%) patients. 49 patients (81.67%) had membrane present and no conclusive difference was recorded in the progress of labor based on the presence of membrane.

The common indicators for LSCS among primigravida patients were recorded to be non-progress of labor and foetal distress. This was comparable with the studies done by Lakshmidevi et al.[16]

Given this study was recorded at a tertiary health care centre where partographs are used on a routinely basis by health care workers, our results cannot be generalised. Further studies should be conducted in the primary health care centres and its peripheries where the wide adoption of partograph can result in early detection and referrals to higher care centres.

CONCLUSION

The partograph can be used to assess the progress of labor and to identify when intervention is necessary. It helps the health care provider in identifying the slow progress of labour and provides an early warning system for early referral and may also help to initiate appropriate interventions within a timely manner. It is an easy-to-use paper tool with over 12 parameters which aids health care workers across the medical service delivery points. Proper partograph utilisation improves labor outcomes, reduces unnecessary strain on mothers and its wide adoption can prevent complications and result in normal labor and delivery. Plotting of partograph also improves comprehension of labour among medical students and resident medical staff. The quality of communication with consultants is improved and decisions become more rational.

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