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ROLE OF PARTOGRAPH IN THE MANAGEMENT OF LABOUR IN PRIMIGRAVIDA

Gynecology

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ABSTRACT

Objectives: This study was to analyse the patterns of labour amongst term primigravida in active labour using WHO modified partograph & study the outcomes of labour, mode of delivery & neonatal outcomes amongst the different partograph pattern.

Method: A retrospective study was carried out analysed on 270 primigravida women by using WHO modified partograph in the labour room, Department of Obstetrics & Gynaecology, Belagavi institute of Medical Sciences, Belagavi, Karnataka. This was carried during the months of November and December 2017.

The women were divided into 3 groups. Group I includes women whose partograph remained to the left of the alert line. Group II includes women whose partograph remained between alert line and action line & group III includes women whose partograph crosses action line.

The different types of abnormal labour, maternal & neonatal outcomes was studied in each of the three groups.

Statistical analysis: was done by Chi-square test.

Result: Among 270 women, 178 (65.92%) cases belonged to group I, 62 (22.96%) belonged to group II and 30 (11.11%) belonged to group III.

Cervical dilatation was at the rate of 1.5 cm per hour in group I. 0.9 cm per hour in group II and 0.6 cm per hour in group III.

The mean duration of active phase of labour were 4.3 hrs, 6.9 hrs and 10.15 hrs in group I, II and III respectively.

Conclusion: Surgical interference, requirement of augmentation and mean duration of active phase of labour increased as the labour curve moved to the right of alert line. Increased rate of instrumental deliveries, LSCS, babies with lower APGAR score at 5 minute and NICU admissions were observed in group III compared to group I and II.

KEYWORDS

Labour, Partograph, Alert Line, Action Line.

Introduction:

"Of the entire journey through our life we make, the most dangerous one remains the first that we take through the birth canal"[1]. The reason being that although it is a natural process but complication can arise at any time during its course. The care of women received during labour should not only help her to cope with stress and pain of labour but also minimize dangers involved. In recent years a systemic and scientific attempts has been made to curtail the duration of labour. Theres has now been a complete break in this tradition and the concept of passive supervision during labour is being replaced by one of active management.

Labour is a balance between the forces required to expel the fetus and the resitance of the cervix to dilate. Normal labour relies on these two forces being orchestrated physiologically. The importance of the time element is reflected by the relationship of the fetal and maternal morbidity and mortality and the duration of labour. This leads to surgical intervention with further danger to both the mother and fetus. Hence, prolonged labour and obstructed labour must be prevented by timely and effective measures, so as to give the mother a safe and happy experience of labour and child birth.

The safe motheerhood initiative (SMI) emphasises that the monitoring of labour for early detection of dystocia is one of the most important approaches for reducing maternal and neonatal morbidity and mortality[2]. In this context, the partogram has been adopted by the WHO (World health Organization) to monitor labour in maternity clinics in developing countries as a simple managerial tool to prevent prolonged labour, obstructed labour and its sequelle.

The partograph, a graphic recording of progress of labour and salient features in the mother and fetus has been used to detect labour that is not progressing normally, to help in early decision on augmentation and termination of labour[3]. The partograph serves as "early warning system" and it has shown to be effective in preventing prolonged labour, in reducing opertive interventions and in improving the neonatal outcome[4].

"A picture is worth a thousand words". A partograph review if well recorded provides rapid and comprehensive information about progress of labour when compared with a review of detailed hand written case sheets.

Partograph is a Latin / Greek hybrid word synonymous with parturition recorded in a graphic form.

WHO partograph is a composite graphic representation of events that takes place in labour plotted against time in hours on a pre-printed paper. It consists of three parameters:

Parameters used to assess:

1. Progress of labour – a) Cervical dilatation, b) Descent of head and c) Uterine contractions
2. Fetal conditions – a) Fetal heart rate (FHR), b) Colour of Liquor and c) Moulding of fetal head.
3. Maternal condition – a) Pulse rate, b) Blood pressure, c) Temperature and d) Urine for volume, protein and ketone bodies.

WHO partograph allows objective graphic documentation of progress of labour and simplfies clinical interpretation of dynamic changes that occur during labour.Therefore it is a simple tool that is easy to learn and use which saves cost and at the same time helps to improve outcome for the mother and neonate[3,5,6].

Dr. Friedman in 1954 plotted womens labour on a graph and defined various stages of labour and abnormal pattern of labour[7]. Philpott in 1972 devised a composite labour picture and introduced the alert line and action line to the partograph[3].

WHO in 1994 endorsed the partograph, later modified it in 2000, removed latent phase and defined active phase at 4 cms instead of previously used 3 cms. WHO advocated its use as a necessary excellent tool in reducing obstructed and prolonged labour and its consequences. WHO recommended its universal use during labour[8].

Cochrane data base review done in 2009 has recommended the use of partograph curve in the developing countries because of poor access to health care resources[9].

In the study we plan to analyse the patterns of labour amongst primigravida parturients using a WHO modified partograph. We also compared outcomes of labour and their neonatal outcomes amongst the different partograph patterns.

Methods:

The retrospective study was carried in labour room, Belagavi Institute of Medical sciences, Belagavi, Karnataka from November 2017 to December 2017. During this period, 270 primigravida who fulfilled the inclusion criteria were taken into consideration.

Inclusion criteria:
1. Gestation age > 37 weeks with vertex presentation
2. Singleton pregnancy
3. Spontaneous or induced labour
4. 1st stage of labour with cervical dilation < than 7 cms

Exclusion criteria:
Patients with factors such as
1) Obstetrics complications: a) Abnormal presentation b) Multiple pregnancy c) Cervical dilatation > 7 cms d) Antepartum hemorrhage
2) Medical complications – Severe PIH, Severe anaemia and gestational diabetes mellitus.

Detailed history was taken. General physical and systemic examination and pelvic assessment was done. The labour details were plotted on WHO modified partograph when the women enters into active phase of labour, i.e. cervical dilatation was 4 cms and plotting was done on the alert line. Four hourly per vaginal examination was recommended.

The primigravida in labour had a careful monitoring of progress of labour which was recorded in detail on a WHO modified partograph which displayed all the factors of labour on a single sheet of paper. Monitoring of maternal and fetal conditions were carried out clinically and plotted on partograph.

Whereever necessary augmentation of labour was done after 4 cms of cervical dilatation by amniotomy or oxytocin or both.

Decision for Caesarean section or instrumental delivery taken whenever indicated. Active management 3rd stage stage of labour done in all the groups.The study group is divided into 3 groups:

Group I: Patient who delivered when partograph is on or before the alert line.
GroupII: Patient who delivered when the partograph crossed alert line but not action line.
Group III: Patient who delivered when the partograph crossed action line.

The mode of delivery was assertained and perinatal outcome was analysed by studying condition of baby at birth and neonatal response.

Institutional ethical clearance for the study was obtained on 20.04.2018.

Statistical analysis: Collected data will be presented in percentage. Chi-square test will be used to see the association between different attributes. P value less than 0.05 will be considered as significant.

Results:
In this study group, out of 270 primigravida 243 (90%) women were in the age group of 18-25 yrs, 20 women (7.4%) in the age group of 26-30 yrs and 07 (2.59%) women in the age group 31-35 yrs.

Table 1: Mode of delivery

Mode of delivery	Frequency	Percentage
Spontaenous vaginal delivery	191	70.74%
Forceps delivery	10	3.7%
LSCS	69	25.55%
Total	270	100%

Chi. Square = 189.36 P<0.001
Table shows subjects are not uniformly distributed among the three modes of delivery.

191 (70.74%) women were delivered vaginally followed by LSCS (69 nos i.e. 25.55%) and forceps delivery (10 nos, i.e. 3.7%).

Table 2: Distribution of cases in relation to their partograph pattern

Partograph	Frequency	Percentage
Group I	178	65.92%
Group II	62	22.96%
Group III	30	11.11%
Total	270	100%

Chi. Square = 134.76 P<0.001
Table 2 shows subjects are not uniformly distributed among the groups.

178 women (65.92%) of Group I delivered when partograph was within alert, 62 women (22.96%) of Group II delivered when partograph was between alert line and action line and the rest (30 nos. i.e. 11.11%) of group III delivered when partograph crosses action line.

Table 3: Mode of delivery in relation to partograph pattern

Type of delivery	Partograph			
	Group I	Group II	Group III	Total
Spontaenous vaginal delivery	155 (87.07%)	31 (50.00%)	5 (16.66%)	191 (70.74%)
Forceps delivery	1 (0.56%)	6 (9.70%)	3 (01.00%)	10 (03.70%)
LSCS	22 (12.35%)	25 (40.30%)	22 (73.33%)	69 (25.55%)
Total	178 (100%)	62 (100%)	30 (100%)	270 (100%)

Chi. Square = 81.03 P<0.001

Table 3 shows an association between type of deliveries and groups. Vaginal delivery was highest in group I followed by group II and group III. The proportion of LSCS was higher in group III than in group II & I.

Table 4: Augmentation of labour in relation to partograph pattern

Augmentation	Partograph			
	Group I	Group II	Group III	Total
No	132 (74.15%)	20 (32.25%)	01 (03.30%)	153 (56.66%)
Yes	46 (25.84%)	42 (67.74%)	29 (96.66%)	117 (43.33%)
Total	178 (100%)	62 (100%)	30 (100%)	270 (100%)

Chi. Square = 71.97 P<0.001
Table 4 shows an association between augmentation and partograph groups.

There, were more number of deliveries requiring augmentation among group III followed by group II and group I.

Table 5: Indications for forceps deliveries and LSCS and partograph pattern

	Partograph			
	Group I	Group II	Group III	Total
Fetal distress	23 (100%)	13 (41.93 %)	5 (20%)	40 (51.89%)
Secondary arrest of descent	0	09 (29.93%)	09 36.00%)	18 (22.78%)
Secondary arrest of dilatation	0	09 (29.93%)	11 (44.00%)	20 (25.31%)
Total	23 (100%)	31 (100%)	25 (100%)	79 (100%)

Chi. Square = 32.87 P<0.001

Table 5 shows an association between indications and partograph groups.

Fetal distress was the main indicator for instrumental and LSCS in group I (23 nos; 100%). In group III, the main indicator for instrumental delivery / LSCS is secondary arrest of descent (9 nos; 36%) and secondary arrest of cervical dilatation were (11 nos; 44%).

Table 6: Admission to delivery interval in different groups

Duration in hours	Partograph			
	Group I	Group II	Group III	Total
Less than 10 hrs	145 (81.35%)	14 (22.44%)	03 (08.57%)	162 60%)
10-18 hrs	33 (18.60%)	43 (69.38%)	12 (40%)	88 (32.59%)
More than 18 hrs	0	05 (08.16%)	15 (51.42%)	20 (08.14%)
Total	178 (100%)	62 (100%)	30 (100%)	270 (100%)

Chi. Square = 164.32 P<0.001

Table 4 shows an association between duration and partograph groups.

The average admission to delivery interval in group I is 7.53 hrs, in group II is 12.82 hrs and in group III it is 17.13 hrs. Number of women undergoing more than 18 hrs is maximum in group III is 15 (51.42%).

Table 7: Neonatal response in relation to partograph pattern

Neonatal response	Partograph			
	Group I	Group II	Group III	Total
Spontaneous cry	172 (96.60%)	50 (80.64%)	16 (53.33%)	238 (84.14%)
Cry after resuscitation	05 (02.80%)	08 (12.90%)	07 (23.33%)	20 (07.40%)
NICU	01 (0.56%)	04 (06.45%)	07 (23.33%)	12 (04.44%)
Total	178 (100%)	62 (100%)	30 (100%)	270 (100%)

Chi. Square = 54.54 P<0.001

Table 7 shows an association between neonatal response and partograph groups.

Majority of neonates in the three partograph groups has APGAR $\geq$ 7 at one and five minutes.

APGAR < 7 at one minute in group III was 46.66% (14 nos) in group II was 19.40% (12 nos) and in group I was 03.36% (6 nos)

APGAR < 7 at 5 minutes in group III was 23.33% (7 nos),in group II was 06.45% (4 nos) and in group I was 0.56% (1 no).

The neonatal response was significantly different between the 3 partograph groups. Spontaneous cry was the response in majority of neonates in all the 3 groups. NICU care and cry after resuscitation were proportionately more in groups II and III than group I.

Cry of resuscitation was seen in 5 (2.8%) neonates of group I, 8 (12.90%) neonates in group II and 7 (23.33%) of neonates in group III. The babies cried after resuscitation were in NICU for few hours for observation. The babies who required NICU care were shifted to mother's side within 4-5 days. There was no neonatal deaths.

Discussion:

Although labour is an natural phenomenon leading to child birth occuring spontaenously, a few tend to become dystonic and result in prolonged labour. Hence it is essential to identify the abnormality early and deliver them safely in time by appropriate intervention.

Friedman (1954)[7], Philpott RH (1972)[3], John Studd (1973)[10], and many others have suggested criteria for early recognition of abnormal labour evolved through their vast experiences. Philpott's aids the recognition of abnormal labour and can indicate correct timing of intervention by use of alert line and action line based on cervical dilatation.

The WHO model of the partograph has been devised by an Informal Working Group which examined in most of the available published work on partograph and their designs. It represents a synthesised and simplified format including the best feature of several partographs[8].

Since then many Obstetricians started using this concept as an aid to intrapartum management and various studies have been conducted by number of researchers.

In this present study 270 term primigravida in labour analysed the labour progress and their outcomes by means of modified WHO partograph. In this study age had no association with partograph pattern. Majority of women delivered vaginally followed by instrumental delivery and LSCS.

The distribution of patients and mode of delivery in relation to partograph pattern was comparable to studies of Lakshmidevi et al[11], Penumadu et al[12].

The acceleration of labour was carried out more in Group II & group III compared to group I. So,when we plot progress of labour on partograph we can predict outcome of labour.

In this study, of all the labour abnormalities observed in group II & group III, dilatation abnormalities were more common than descent abnormalities. The indications for LSCS and forceps deliveries were different between the partograph groups. All were for fetal distress in group I and descent and dilatation abnormalities were more in group II & group III.

Duration of the active phase of labour is the main indicator of delayed progress of labour. The rate of cervical dilatation was the main factor affecting as the curve shifted to right side. The least dilatation rate was observed in group III women (0.6 cms per hour) followed by group II (0.90 cms per hour) and group I (1.5 cms per hour). These rates are comparable to those of the study conducted by Lakshmidevi et al[11], Penumadu et al[12].

The mean duration of 1st stage of labour and partograph was almost double in women who crossed action line than women delivered within alert line. The mean duration of 2nd stage of labour was not different between all the groups was 52-55 minutes. The mean duration of 3rd stage of labour is 15-17 minutes.

There was no difference of mean birth weight between the three partograph groups. APGAR less than 7 and cry after resuscitation were predominantly more in group II and group III than in group I.

Most babies (88.14%) in all 3 groups had spontaneous cry and APGAR $\geq$ 7 at one and five minutes. There was no neonatal deaths and comparableto studies of Penumadu et al[12].

In our study there was no maternal death or any other major maternal morbidities So by plotting partograph neonatal outcome can be predicted and maternal complications can be reduced.

Conclusion:

The graphic record of labour progress make early recognition of progress possible through its visual presentation of Important clinical information regarding labour.

With the help of partograph, the time of delivery could be estimated and if the progress was slow, an appropriate interference at the right time could be instituted before the labour becomes dangerously protracted. The neonatal morbidity was found to be decreased with the help of partographic monitoring of labour.

The alert line on the partograph seperates efficient labour from inefficient labour and it detects the earliest possible distosic situation, i.e., reducing the incidence of prolonged labour.

The action line on partograph identifies an "at risk" group of patients requiring acceleration of labour, intensive monitoring and instrumental or operative deliveries.

Simplified WHO partograph is a simple economical time saving and effective tool to detect labour abnormalities earlier and their early reference to higher centre.

Routine use of partograph should be implemented in all the institutions and all albour rooms in India, especially in area where operative and newborn facilities are lacking to facilitate early referral and reduce neonatal and maternal morbidity and mortality.

WHO partograph should be used only for low risk labours where spontaneous delivery is anticipated. The partograph does not replace adequate screening of women on arrival in labour room to exclude conditions that require urgent attention or immediate transfer. It is designed to detect deviation from normal which develops as labour progresses.

Even though partograph is a old tool, still it remains gold standard even for modern obstetric care.

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