

Original Research Article

Management of Labour in Primigravida with Who Modified Partograph

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Abstract: Partograph is an inexpensive tool that serves as an "early warning system" and can assist in early decision making on transfer, augmentation, and termination of labour. The main objectives of the study were to compare length of labour, need of oxytocin augmentation, delivery outcome between two groups, neonatal outcome monitored by APGAR Score and incidence of maternal complications. This was a randomized, prospective, comparative study. Primigravida, aged 19-28 years, with single live foetus in vertex presentation without any medical and obstetrical complications who have crossed 37 weeks of gestation, but not post term pregnancies have been included in the study. Results were compared between 500 cases, by using WHO modified partogram (Study group) and 500 cases (control group) by monitoring labour without any partogram. Spontaneous vaginal delivery rate had been significantly increased in study group ($p < 0.0001$), need of labour augmentation with oxytocin found to be reduced in study group. Rate of caesarean section was less in study group. Duration of labour has been significantly shortened in study group ($p < 0.0001$). Fetal outcome was better in study group, monitored with APGAR Score at 1 minute and APGAR Score at 5 minute. There was no significant difference in maternal mortality and morbidity found between the two groups. Therefore, WHO modified Partograph is easier to use and is a better option for midwives in primary health care centre and tertiary care centre if attached with referral slip, to take an appropriate decision at its earliest.

Keywords: Labour, WHO modified partograph, primigravida, fetal outcome, maternal outcome.

INTRODUCTION

Labour, has been regarded as the most dangerous journey a human being ever under takes. An older belief "the sun should never set twice in a labour" has scientific approach as any labour lasting for more than 24 hours is associated more commonly with maternal complication (viz. Obstructed labour, traumatic delivery, PPH, puerperal sepsis, vesicovaginal fistula) and Fetal complications (viz. Fetal hypoxia, infection) [1]. In India, Maternal mortality ratio in 2015 was 174/100,000 livebirth [2]. Every day, approximately 800 women die from preventable causes related to pregnancy and childbirth (WHO, 2012) [3]. The maternal mortality ratio in developing countries in 2013 was 230 per 100,000 live births versus 16 per 100,000 live births in developed countries [4]. The major complications that account for nearly 75% of all maternal deaths are: severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth) high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from delivery and unsafe abortion [4].

Postpartum haemorrhage and sepsis are the most common causes of maternal death in developing countries, but obstructed labour and ruptured uterus may cause as many as 70% of all maternal deaths in some situations [3, 4].

The World Health Organization recommends using the partograph to follow labour and delivery, with the objectives to improve health care and reduce maternal and fetal morbidity and death (WHO, 1993) [5].

The Partograph is a pre-printed paper form on which labour observations are recorded [5, 6]. The aim of the Partograph is to provide a pictorial overview of labour, to alert midwives and obstetricians to deviations in maternal or fetal wellbeing and labour progress [4, 5, 9]. Partography is designed for all maternal settings, but has different level of functions at different levels of health care. It serves as an "early warning system" and

assists in early decision on transfer, augmentation and termination of labour [8, 9].

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 [6]. The active phase is provided with an alert line and an action line, drawn 4 hours apart on the partograph as aids to monitoring labor [6]. This partograph is based on the principle that during active labour, the rate of cervical dilation should not be slower than 1 cm/hour [6]. A lag time of 4 hours between slowing of labour and the need for intervention is unlikely to compromise the foetus or the mother and avoids unnecessary intervention [6].

Following problems were encountered subsequently with routine practice of composite partograph-

- Problems with diagnosis of labour as there are no universally acceptable definite criteria to diagnose labour.
- Varying length of latent phase of labour leads to make it difficult to interpret when to interfere.
- Difficult to follow with frequent mistakes.
- Unnecessary intervention in the form of increased referral to tertiary care centre, augmentation and increased rate of caesarean section.
- In 2000, "WHO Modified Partograph was introduced, following the launch of integrated management of pregnancy and child birth (IMPAC) in managing complication in pregnancy and childbirth. In WHO modified partograph latent phase has been excluded and active phase has been considered at 4 cm of cervical dilatation [11].

WHO Modified Partograph also called as simplified WHO Partograph is more user friendly and monitoring of labour is associated with lesser incidence of caesarean section and better outcome of pregnancy [13, 14].

The present study has been done to evaluate the efficiency of partograph in managing labour and its impact in reducing maternal and fetal morbidity in low risk primigravida with cephalic presentation in labour.

The idea of taking primigravidae in this study is that they are an unknown lot. Their obstetric behaviour is not known and they are more to develop dystocia due to inefficient uterine action. On the other hand in primigravidae, the obstetrical future is dependent on the previous obstetric history to a great extent.

MATERIALS AND METHODS

The present study was a prospective hospital based randomised study. The study was carried out in the department of Obstetrics and Gynaecology, Gauhati medical college and hospital, Guwahati. The study was approved by ethical committee of the institution.

A total number of 1000 primigravid cases admitted in labour room were divided equally into study group and control group. In study group labour was monitored with protocol and guidelines as specified in WHO modified partograph, while in control group the whole duration of labour was monitored without using any partograph.

Labouring mothers were admitted to the hospital after taking full history and examination and all were sent for haemoglobin level, blood group and RH random blood sugar, general urine examination and ultra sound examination. Inclusion criteria: primigravida, aged 19 to 29 at term (had crossed 37 weeks of gestation) with singleton live, term, cephalic presentation, uncomplicated pregnancy inspontaneous labour. Exclusion criteria: Multipara, short stature <140 cm, teenage pregnancy, elderly primigravida, multiple pregnancy, malpresentation, post-caesarean pregnancy, post term pregnancy, preterm labour, oligohydroamnios, intrauterine death, associated medical complications like diabetes, essential hypertension, heart disease, anaemia, associated obstetrical complications like APH, placenta previa, pre-eclampsia / eclampsia.

For each case fulfilling the inclusion criteria, following information should be plotted on the graph: patient's name, age, gravida and parity status, registration number of the hospital, date and time when first attended for delivery. Labouring women were followed in the following sequences:

Fetal Condition [7]

Normal fetal heart was between 110–160. <110 or >160 beat per minute indicated fetal bradycardia or fetal heart tachycardia respectively which requires immediate action. We monitored the fetal heart for at least one minute at interval of every half hour; the best time for to the fetal heart was immediately after peak of the uterine contraction. Fetal heart rate plotted with a dot, subsequent dots are connected by solid line. The state of amniotic membranes was evaluated.

On the other hand, Moulding is an important indicator of how well the pelvis can accommodate fetal head.

Progress of Labour [7, 8]

Central part of the Partograph is the area of cervical dilatation. On left side of the Partograph number from zero to ten is printed, vertical line of each square represent one centimetre per hour and the horizontal line of each square represent half hour. Plotting on the partograph begins in active phase of labour, when cervix is 4 cm dilated. There are two diagonal lines in this section of Partograph, the alert line and action line. Action line is four hours right to the alert line. When rate of cervical dilatation shifted to the right of the alert line, it indicates slow progress of labour and need appropriate action like amniotomy or augmentation of labour. When cervical dilatation reaches or crosses the action line, it indicates dangerously slow progress of labour, in this situation decision must be taken.

For continuous monitoring of labour, regarding cervical dilatation we did vaginal examination every four hours or more frequently if indicated. After full dilatation of the cervix we continued to record, uterine contractions, blood pressure, pulse rate, and fetal heart.

Descent of the fetal head [7]

Monitoring of descent of foetal head was performed by abdominal examination immediately before vaginal examination. We recorded the head position on the Partograph with "O".

Uterine contractions [7, 8]

Numbers of contractions in ten-minute period describe the frequency of contractions. Duration of each contraction was recorded from the first time felt abdominally to the time when contraction passed off and was measured in seconds. Observations of the contractions were made every 30 minutes on the Partograph. Frequency of uterine contractions is numbered from 1-5 squares on partogram. Each square represent one contraction and are shaded with appropriately according to intensity.

If inadequate uterine contractions were found as the cause of unsatisfactory progress of labour detected, we considered amniotomy first followed by oxytocin infusion to augment labour.

There is separate area for recording oxytocin titration and drugs used.

Maternal Condition [6]

Blood pressure, temperature, volume and content of urine are recorded on the bottom of Partograph.

Neonatal Outcome [6]

Neonatal outcome was monitored with APGAR scores, at one minute and five minute, weight and any abnormality was recorded on the Partograph.

Statistical Analysis

The results were expressed as mean and standard deviation. The statistical differences between cases and controls were determined by t-independent sample test (two-tailed). Data analysis was performed with the Statistical package for social sciences software 21.0 version (SPSS, Chicago, Illinois, usa). Level of significance (P-Value) ≤ 0.05 was considered as significant and ≤ 0.001 as highly significant.

RESULTS

In this study around 51% women had been registered in the antenatal outpatient department with minimum three visits and 46% were unregistered with no antenatal visits. Highest number of patients was found in age group between 21-25 years.

The impact of implementing partograph in labour management is as follows-

Table 1. shows spontaneous vaginal deliveries increased from 69.40% to 83.80% when compared between cases and controls. Instrumental deliveries were less common in cases (8.2%) than in controls (12.6%) and emergency caesarean section rate was also reduced significantly i.e. 18% in controls as compared to 8% in cases. This was statistically highly significant with p value < 0.0001 .

Indications for emergency caesarean section were showed in table 2; there was overall reduction in caesarean section for foetal distress i.e. from 7.2% in controls to 5.2% in the cases where partograph was used. The most significant difference was found in women who required caesarean section for prolonged first stage of labour i.e. 9.6% which reduced to 2.4% in cases. In addition, there was reduction in caesarean section rate from 1.2% in control to 0.4% in case for deep transverse arrest. This reduction was also found to be statistically significant.

Table 3. shows the analysis according to duration of labour in between cases and control. Labour was completed before 12 hours in 95.8% study group. In control group, only 81.6% of women delivered within 12 hours. These findings were statistically highly significant with p value < 0.0001 .

Table 4. Shows that in only 13.2% of cases require labour augmentation in study group as compared to 28% in control group. Frequency of P/V examination was far less in cases than controls. In the study group, 82% of cases required P/V examination 1—2 times. None of the cases required P/V examinations for more than 4 times. In control group, 69.6 % cases required P/V examination 1—2 times and 4 % cases required for 5 or more times.

Table-1: showing mode of delivery between cases and controls of study

MODE OF DELIVERY	STUDY GROUP		CONTROL GROUP	
	CASES	PERCENTAGE	CASES	PERCENTAGE
SPONTANEOUS VAGINAL DELIVERY	419	83.8%	347	69.4%
OPERATIVE DELIVERY	41	8.2%	63	12.6%
LSCS	40	8%	90	18%
TOTAL	500	100%	500	100%

Table-2: Showing indication of labour between cases and controls of study:

INDICATION OF LSCS	STUDY GROUP		CONTROL GROUP	
	CASES (40)	PERCENTAGE (8%)	CASES (90)	PERCENTAGE (18%)
Fetal distress	26	5.2%	36	7.2%
Arrest of cervical dilatation	9	1.8%	26	5.2%
Arrest of descent of fetal head	3	0.6%	22	4.4%
Deep tranverse arrest	2	0.4%	6	1.2%

Table-3: Showing duration of labour between cases and controls of study

DURATION OF LABOUR	STUDY GROUP		CONTROL GROUP	
	CASES	PERCENTAGE	CASES	PERCENTAGE
Less than 12 hours	479	95.8%	408	81.6%
12-16 hours	21	4.2%	92	18.4%
More than 16hours	0	0%	0	0%
Total	500	100%	500	100%

Table-4: Showing need of labour augmentation

LABOUR AUMENTATION	STUDY GROUP		CONTROL GROUP	
	CASES	PERCENTAGE	CASES	PERCENTAGE
OXYTOCIN	66	13.2%	140	28%

There was no statistically significant difference in neonatal outcome found between the two groups. Women in whom partograph was used had 4 out of 500 babies with 1 minute APGAR score below 7, only 2 babies had 5 minute Apgar score below 7. However, in control group 10 out of 500 babies had 1 minute Apgar score below 7, 6 babies had 5 minute Apgar score below 7. In control group, 6 babies were shifted to NICU, out of 6 of these neonates, 3 were delivered by forceps application for fetal distress in 2nd stage, in 1 case labour was accelerated with oxytocin infusion and delivered normally and 2 babies delivered by caesarean section (the indications were prolonged labour and obstructed labour). There was no maternal or perinatal mortality in the present study. Main causes of maternal morbidity were puerperal pyrexia, postpartum haemorrhage (PPH), wound infection. 5 cases were developed puerperal pyrexia in control group, there were none in study group. In study group, 4 out of 500 cases had PPH. Out of 4 cases, 3 had atonic PPH, 1 had traumatic PPH followed by forceps application and

cervical tear was repaired. 1 case in study group was complicated with vaginal hematoma, which was drained under GA with 1 unit of blood transfusion. Out of 500 cases in control group, 6 cases were developed PPH. Out of 6, 5 cases had successful medical management and one patient with B negative blood group required surgical approach after failure of medical management with 3 units of blood transfusion.

DISCUSSION

E.A. Friedman in 1954 was done a study on a large number of women in the USA and described a normal cervical dilatation pattern [10]. In 1969 significant reduction in the caesarean section rate (more than 50%; 44% in control and 21% in cases) was achieved with the introduction of partogram with a corresponding rise in spontaneous vaginal deliveries. Minimal reduction in operative deliveries was also achieved. Our study also reveals higher incidence of spontaneous vaginal delivery in study group (83.8%), reduction in caesarean section rate from 18% in control

to 8% in study group and incidence of instrumental vaginal delivery has reduced to 8.25%. The results of present study are comparable and in agreement with that of many other authors- Javed *et al* reported normal vaginal delivery in 88%, operative vaginal delivery in 5.6 % and caesarean section in 6.4 % with use of partograph [12]. Orji *et al.* also reported spontaneous vaginal delivery in 94.6%, instrumental in 4.9%, caesarean section in 4.5% of cases [11]. Md Alauddin *et al.* found normal vaginal delivery in 82.7%, instrumental in 8.33%, caesarean section in 8.88% [13].

When we consider the incidence of prolonged labour with the use of partograph it was significantly reduced in our study with none of the women having labour beyond 12 hours. Javed *et al.* reported that introduction of partogram showed significant impact on duration of labour ($p < 0.001$) with 91.6% subjects delivered within 12 hours [12]. Orji *et al.* reported 95.9% cases delivered within 12 hours [11]. Md Aladuddin *et al* reported 95.5% patients delivered within 12 hours with introduction of partogram [13].

Implementation of WHO modified partograph improved management of labour by significant reduction in labour augmentation with frequency of vaginal examination. The findings of labour augmentation are comparable to that of WHO Multicentral trail (13.7% vs 32.1% in control) [15, 16] and Md Alauddin *et al.* (9.44% in study vs 28% in control) [13]. While Orji *et al.* reported higher number of patients need labour augmentation and decreased incidence of frequency of vaginal examination with use of WHO modified partograph [14].

CONCLUSION

With present study it can be concluded that WHO Modified Partograph is a simple inexpensive and reliable device to provide a continuous pictorial depiction of most events of the labour. It is more user friendly so can be easily used by midwives & trained health personal in primary health care centre and if attached with referral slip to tertiary care centre, gives an overall idea of labour events so that appropriate decision can be taken at its earliest. It improves labour outcome by decreasing caesarean section rate, maternal and fetal morbidity by indicating proper time of intervention in cases of delayed progress of labour. The final and most important benefit of partograph in 21st century is that, the filled pantograph can act as a self-explanatory document to face any quarries for the concerned authority or even for the court of law.

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