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Vinay Kumar
Department of Obstetrics &
Gynaecology, Dr. Rajendra
Prasad Govt. Medical College
Kangra, Tanda, Himachal
Pradesh, India

Dr. Kranti Bisht
MS Medical Officer, Civil
Hospital, Palampur, Kangra,
Himachal Pradesh, India

4-hourly action line on WHO modified Partograph, and maternal and neonatal outcomes

Vinay Kumar and Dr. Kranti Bisht

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 hyper stimulation, hypo stimulation and fetal distress and provide timely surgical intervention where required. Objectives of the study were to evaluate outcome of labour in terms of action line crossed and augmentation of labour and in whom labour has been managed with 4-hour vs no-hour action line on WHO modified partograph.

Methods: Every 8th primigravida mother fulfilling the inclusion criteria was enrolled for the study alternatively for 4 hourly and no partogram reading. Results were compared between Group A, with 50 cases, in whom labour has been managed with WHO modified Partograph with 2-hour action line and Group B, with 50 cases, in whom labour has been managed with that of no action line.

Results: The present study shows that more women in 2-hour arm crossed the action line, compared with the no partograph arm, and therefore received more interventions to augment labour. Rate of caesarean section was more in group B than in group A which is statistically non-significant.

Conclusions: Partograph with 4-hour action line did not show any superiority over that of no partograph line but to be associated with higher incidence of intervention. Further research is required in this field of active management.

Keywords: 4-Hour action line, partograph, WHO modified 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 prologed 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 center 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].

Obstructed labour is a leading cause of maternal and neonatal mortality, especially in developing countries [3]. Globally, it is estimated that obstructed labour occurs in 5% of pregnancies and accounts for an estimated 8% of maternal deaths [4, 5]. Obstructed labour may result in serious complications such as obstetric fistula, uterine rupture, puerperal sepsis and postpartum haemorrhage [6, 7].

The present study was aimed to evaluate the effect of use of 4-hourly partograph on progress of labour and on delivery outcomes.

Methods

The hospital-based observational study was carried out in the Department of Obstetrics and Gynaecology at Dr. Rajendra Prasad Government Medical College, Dist. Kangra H.P. over a period of one year.

Corresponding Author:
Dr. Kranti Bisht
MS Medical Officer, Civil
Hospital, Palampur, Kangra,
Himachal Pradesh, India

One hundred women, 50 each in 4 hourly (group A) and no partogram (group B) recording. Every 8th primigravida mother fulfilling the inclusion criteria was enrolled for the study alternatively for 4 hourly and no partogram reading. Inclusion criteria were pregnant women in spontaneous and induced labor, first stage of labor with cervical dilatation 4 cm, singleton pregnancy more than 37 weeks gestation, and/or cephalic presentation. The following subjects were excluded if antepartum hemorrhage, breech presentation, multiple pregnancy, cervical dilation >4 cm, and/or premature labor less than 36 weeks.

All the laboring women who satisfied the inclusion criteria and had given their consent to be included into the study were randomly allotted either into, group A (women who were to be monitored in the active phase of labour using modified WHO Partograph; 4-hour), and group 2 (patients whose active labour was not monitored using modified WHO Partograph.) On admission to the hospital, a detailed history to know the exact time of onset of labor pains, or leaking membranes along with a detailed menstrual and obstetrics history was elicited.

After an initial preparation of the patient, examination of the patient was carried out with reference to maternal conditions like height, stature and built. All the vital signs were noted and a detailed systemic evaluation was done. Local examination was directed to know the fetal lie, position, presentation and to know whether the head is floating, fixed or engaged. The rate, regularity and position of the fetal heart rate was noted. Pelvic examination under aseptic precautions was done to know the position, consistency, effacement and dilation of the cervix. The state of membranes, whether intact or ruptured and color of liquor was noted. The partogram was attached to the mother's case record when patient was admitted in the labor room.

Routine neonatal care was given to all newborns of enrolled mothers. APGAR score was noted at 1 minute and 5 minutes. Complete neonatal examination was carried out. All the neonates with perinatal asphyxia, meconium aspiration syndrome, RDS and admission in the NICU were followed up till discharge to note their outcome.

Definition

All the definitions of WHO modified partogram were used for the study purpose.

Statistical analysis

Data were expressed as frequency, percentages, mean, and/or standard deviation. Categorical variables were compared using Chi-square test. Quantitative variables were compared using Student t-test. P value <0.05 was considered significant. Statistical analysis was performed using SPSS v21.0.

Results

Association between hourly line and maternal characteristics

Table 1 shows association between hourly line maternal characteristics. Booking status, medical illnesses, mode of labor, and mode of delivery were comparable between both groups ($p>0.05$). However, mean age of women in group A was significantly higher than group B ($P = 0.0428$).

Action line crossed and need for augmentation

In our study, 24% patients in group A and 44% patients in group B crossed action line and difference was statistically significant ($P = 0.034$). Augmentation of labor was

significantly lower in 2-hourly group in comparison to no partogram (40% vs. 76%; $p<0.0001$). (Table 2).

Association between hourly line and neonatal characteristics

In this study, none of the neonatal characteristics such as type of liquor, Apgar at 5 min, IUGR, NICU admission, and birth weight was significantly associated with 2 or no partogram ($p>0.05$) (Table 3).

Discussion

Although partograms are in widespread use, little research has been undertaken in the form of randomized studies to assess the efficacy of different placement of the action line. As there is little evidence of what makes a labour dysfunctional and no universal consensus for the best time to intervene dysfunctional labour, the debate between active and expectant management of prolonged labour continues.

In present study, 24% in 4-hourly group and 44% in no partogram group crossed line which is lower than reported by Jain *et al.* [8] who observed 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 our study, method of augmentation was significantly better in 4-hourly group. Kumar *et al.* reported that that more women in 2-hour arm crossed the action line, compared with the 4-hour arm, and therefore received more interventions to augment labour [9].

Table 1: Association between hourly line maternal characteristics

	Group A (n = 50)	Group B (n = 50)	P value
Age (years)	26.7±3.16	25.49±2.72	0.0428
Booking status, n	42	47	0.11
Medical illness, n			0.11
Gestational diabetes	4	7	
Gestational hypertension	11	7	
IHCP	6	2	
Pre-eclampsia	4	0	
Mode of labor, n			0.182
Spontaneous	47	43	
Mode of delivery, n			0.248
FTND	42	35	
Instrumental	4	7	
LSCS	4	8	
Neonatal birth weight (g)	2913.72±292.13	2812.43±419.74	0.164

Table 2: Action line crossed and need for augmentation

	Group A (n = 50)	Group B (n = 50)	P value
Action line crossed, n	12	22	0.034
Augmentation, n	20	38	<0.001

Table 3: Association between hourly line neonatal characteristics

	Group A (n = 50)	Group B (n = 50)	P value
Meconium stained, n	2	2	-
Apgar at 5 min, n ≤7	1	4	0.168
IUGR, n	3	6	0.294
NICU admission, n	1	3	0.307

Conclusion

From this study, we concluded that there were not many changes in 4-hour action line over no partogram. The present study is not able to prove superiority of 4-hour action line over no partogram except augmentation.

Conflict of Interest

They have no conflict of interest.

Financial Disclosure

Nil

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