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Original Research Article

Paperless partogram: a simple clinical tool in effective labour management

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ABSTRACT

Background: Maternal mortality is unacceptably high, about 830 women die from pregnancy or child birth related complications around the world every-day. Prolonged and obstructed labour is one of the major causes of maternal and perinatal mortality and morbidity worldwide. In developing countries like India, around 5% of total maternal deaths are caused by prolonged and obstructed labour. The purpose of the present study is to evaluate the role of paperless partogram in management of labour, identification of abnormal labour and early intervention to prevent the maternal and perinatal morbidity. The objective of this study was to assess the role of paperless partogram in labour monitoring and decision-making in overburdened Indian labour room setup and to evaluate the outcome of the cases.

Methods: A prospective study was conducted at a tertiary care hospital, Kurnool, Andhra Pradesh, between January 2020 to March 2020. A total of 300 pregnant mothers in established labour who fulfilled the inclusion criteria, were included in the study after taking informed consent.

Results: In our study, of all the pregnant women 23 crossed the alert ETD but 16 had delivered vaginally and 2 by caesarean section before action ETD and 5 women crossed the action ETD. Among the 5 who crossed action ETD 3 delivered vaginally and 2 had caesarean section. Majority, of the women who crossed the alert and action ETDs were primigravidae.

Conclusions: From our study, it is concluded that paperless partogram was effective and user friendly in management of labour and prevention of abnormal or prolonged labour.

Keywords: Alert ETD, Action ETD, Prolonged labour, Maternal and fetal outcome

INTRODUCTION

Maternal mortality is unacceptably high, about 830 women die from pregnancy or child birth related complications around the world every-day. It was estimated that in 2017 roughly 2,95,000 women died during and following child birth. Between 2016 and 2030 as a part of sustainable development goals 3 set by United Nations target is to reduce the global maternal mortality ratio to less than 70/100000 live births.¹ Almost all of these deaths occurred in low resource settings and most could have been prevented. In India, around 5% of total maternal deaths are caused by prolonged and obstructed labour.² Skilled care

before, during and after childbirth can save the lives of mothers and newborns. Prolonged and obstructed labour is one of the major causes of maternal and perinatal mortality and morbidity worldwide.

Partogram is a cost effective and affordable health intervention for monitoring progress of labour and acts as an 'early warning system' for appropriate decision making. Partograph was originally developed by Friedman in 1954 based on his observation on labours of women in Zimbabwe, later modified by Philpott and Castle in 1972 by inclusion of alert and action lines, which forms the basis of WHO partogram.^{3,4} The complex WHO

program (1994) has extensive parameters for patient monitoring and evaluation which was further modified in 2000 by eliminating the latent phase. But still it is not that popular among busiest Indian obstetricians where the doctor patient ratio is not comparable with standard WHO guidelines. The current problem is that the complete documentation of WHO partogram is notoriously low because of lack of awareness and proper training, low availability of health personnel, high patient load, lack of supervision, negative perceptions, complexity of plotting the WHO partogram.⁵

With the view to evolve simple user-friendly system for centers with high delivery rates and shortage of trained staff, Debda in 2006 has developed paperless partogram which is the need of the hour for labour management. Paperless partogram is a simple, graphless, non-time consuming, simple two step calculation requiring only basic addition and reading of clock/watch.

It involves calculation of two ETDs (expected time of delivery) which predicts delivery time based on Friedman's formula of cervicometric progress of labour, alert ETD and action ETD. For each labour case, at the very first vaginal examination in active phase of labour, 2 ETDs are to be calculated mentally and written down in big bold letters in front of the case sheet. These ETDs serve as a constant alarm for all the concerned in the labour management and makes them take necessary care.⁶

Aim

Aim of the study was early detection of abnormal labor and timely intervention to prevent prolonged and obstructed labour.

Objectives

Objective of the study was to assess the role of paperless partogram in labour monitoring and decision-making in overburdened Indian labour room setup and to evaluate the outcome of the cases studied.

METHODS

This prospective study was conducted at a tertiary care hospital, Kurnool, Andhra Pradesh, from January 2020 to March 2020. A total of 300 pregnant mothers, irrespective of age and parity in established labour who fulfilled the inclusion criteria, were included in the study after taking informed consent.

Inclusion criteria

Inclusion criteria of the study were as follows any gravid women irrespective of age and parity in established labour with a singleton pregnancy in cephalic presentation, regardless of whether membranes are intact or ruptured. Onset of labour has to be spontaneous.

The cervix must be at least 4 cm or more dilated at the time of inclusion. Gestational age should be 37 completed weeks or more.

Exclusion criteria

Exclusion criteria were patients with induced labour, CPD, malpresentations, previous cesarean section, preterm labour, IUFD, fetal distress, multiple pregnancies, hypertensive disorders of pregnancy, antepartum hemorrhage, patient on epidural analgesia and presence of any other severe complications.

Before starting the study, institutional ethical committee approval was obtained. A detailed history was taken and clinical examination was done. Relevant hematological, biochemical investigations and ultrasound were performed on all study subjects.

Data was collected using a suitable predesigned proforma. Labour progression was monitored. When a patient reached the active phase i.e, 4 cm cervical dilatation, we calculated 2 ETDs- alert ETD and action ETD based on Friedman's rule that cervical dilation occurs at the rate of 1 cm/hr. For example, in a case cervix was found 4 cm dilated at 1 pm her ETDs are alert ETD- 1 PM+6 hours= 7 PM and action ETD-7 PM+4 hours= 11 PM. Both the ETDs were written in bold letters on front page of woman's case sheet. The action ETD was circled with red colour. monitoring of progress of labour was done by 'simple 3C protocol' i.e, C1- care of mother like temperature, pulse, BP, oxytocin drip or drugs; C2- care of fetus: FHR and meconium; C3- care of contraction: duration and frequency of contractions, recorded as for example 2C/10/20 at a glance clarity in-contrast to WHO partogram which uses complex designs. Abnormal findings are encircled in red for flagging at a glance alarm.⁶

How many PVs are to be done?

(a) After allotting the ETDs next PV to be done 3 hours after that and next one at the time of alert ETD and (b) If not delivered by alert ETD next PV to be done 3 hours after alert ETD (in contrast to WHO partogram where PV is done two hourly which causes discomfort to the patient and increases the risk of infection).⁶

For example, if uterine contractions are poor and close to Alert ETD, labour is augmented by arm or by oxytocics as necessary. If the delivery does not occur by Action ETD, the patient is at risk of prolonged labour and termination is planned by suitable medical or surgical intervention.

RESULTS

In our study majority of pregnant women were between age group of 21 to 25 years (51%) with mean age of 25.23 years and multigravida accounted for 56.33%. Most of the women were booked and immunized i.e., 57.6% with gestational age between 37-40 weeks (84%). 63% of the

cases had cervical dilatation of 4cm at the time of assigning alert and action ETD. Of all the cases 23 women crossed the alert ETD but 16 had delivered vaginally and 2 by caesarean section due to fetal distress and secondary arrest in dilatation before action ETD and 5 women crossed the action ETD. Among the 5 who crossed action ETD 3 delivered vaginally and 2 had caesarean section. Majority, of the women who crossed the alert and action ETDs were primigravidae. Augmentation of labour was done in 34.3% (Table 8). 17 out of 300 women underwent LSCS with indications being secondary arrest of dilatation or descent in 6 cases and fetal distress in 11 cases. Maternal complications like PPH was found in 1.6% cases. The mean birth weight of newborns was 2.91 Kg and majority (95.6%) of newborns were with Apgar>7 at 5 minutes. NICU admission was found in 5% of cases, with major indication being meconium aspiration.

Table 1: Age distribution.

Age group (years)	No. of cases	Percentage (%)
18 to 20	16	5.3
21 to 25	154	51.3
26 to 30	109	36.3
>30	21	7
Total	300	100

Table 2: Parity distribution.

Parity	No. of cases	Percentage (%)
Primigravida	131	43.6
Multigravida	169	56.33
Total	300	100

Table 3: Booked and unbooked cases.

Booking	No. of cases	Percentage (%)
Booked	173	57.6
Unbooked	127	42.3
Total	300	100

Table 4: Gestational age.

Gestational age (weeks)	No. of cases	Percentage (%)
37-40	252	84
>40	48	16
Total	300	100

Table 5: Distribution of cervical dilation.

Cervical dilatation (cm)	No. of cases	Percentage (%)
4	189	63
5	88	29.3
6	23	7.6

Table 6: Distribution of parturients crossing alert ETD.

Crossing alert ETD	No. of cases	Percentage (%)
Yes	23	7.60
No	277	92
Total	300	100

Table 7: Distribution of parturients crossing action ETD.

Crossing action ETD	No. of cases	Percentage (%)
Yes	5	1.6
No	295	98.3
Total	300	100

Table 8: Augmentation of labour.

Augmentation	No. of cases	Percentage (%)
Yes	103	34.3
No	197	65.6
Total	300	100

Table 9: Mode of Delivery.

Mode of delivery	No. of cases
Spontaneous vaginal delivery	277
Forceps	0
Vacuum	6
LSCS	17
Total	300

Table 10: Indications for LSCS.

Indication	No. of cases
Secondary arrest of dilatation and descent dilation	6
Fetal distress	11
Total	17

Table 11: Maternal outcome (complications).

Postpartum hemorrhage	No. of cases	Percentage (%)
Yes	5	1.6
No	295	98.3
Total	300	100

Table 12: Neonatal outcome.

Neonatal	No. of cases	Percentage (%)
Yes	Apgar<7 at 5 min	13
No	Apgar>7 at 5 min	287
Total	NICU admissions	15

DISCUSSION

Though the use of partogram has been universally recommended by WHO, but still its application is limited in low resource settings. Paperless partogram proposed by Debdas's method is simple, low skilled and more acceptable in low resource settings. The present study planned to evaluate the role of paperless partogram in management of labour, identification of abnormal labour and early intervention to prevent the maternal and perinatal morbidity. In this study 300 women were enrolled, various parameters like age, parity, cervical dilatation, parturient crossing alert and action ETD, augmentation of labour, mode of delivery, maternal and neonatal outcome were studied. The observations from our study was in accordance with the studies conducted by Agarwal et al, Lingegowda et al, Kumar et al and Jain et al.⁷⁻¹⁰ In all these studies the paperless partogram was found to be user friendly, effective hand over tool when clinicians changed shifts ensuring continuous monitoring of labour.

CONCLUSION

From our study, it is concluded that paperless partogram was effective and user friendly in management of labour and prevention of abnormal or prolonged labour when compared to WHO partogram in low risk cases. Even though modified WHO partogram is simpler when compared to conventional partogram, but it is still rarely used in overburdened and busy labour rooms and at the peripheral health care centres due to lack of knowledge and awareness. So, at the peripheral health care centres where deliveries are conducted by killed birth attendants implementation of paperless partogram helps in the early identification of abnormal or prolonged labour and referral to higher centres with emergency obstetric care, decreases the maternal and perinatal morbidity and mortality associated with prolonged and obstructed labour.

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Conflict of interest: None declared

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

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