IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 5 Ser. 5 (May. 2019), PP 01-05
www.iosrjournals.org

Implementation of Partograph in Monitoring of Active Phase of Spontaneous Labour at Term and Its Effect on Feto-Maternal Outcome

Dr. Partha Pratim Sinhababu[1], Dr. Rusha Haldar[2], Dr. Prof. Anindya Kumar Das[3], Dr. Prof. Gita Basu Banerjee[4], Dr. Swapan Das[5]

[1,2]*jr Resident, Obst & Gynae, Bankura Sammilani Medical College, Bankura, West Bengal, India*
[3,4]*professor, Obst & Gynae, Bankura Sammilani Medical College, Bankura, West Bengal, India*
[5]*assistant Professor, Obst & Gynae, Bankura Sammilani Medical College, Bankura, West Bengal, India*
Corresponding author: Dr. Partha Pratim Sinhababu[1]

Abstract:
Purpose of the study: *The objective of this study is to evaluate the effect of use of partogram in monitoring of spontaneous labour at term with feto-maternal outcome, to determine the incidence of labour dysfunction and to reduce the rate of caesarean section.*
Methods: *This prospective observational study was carried out in the labour room of the department of Gynaecology and Obstetrics of Bankura Sammilani Medical College & Hospital over a period of one year. 100 patients were allocated to each group. In the study group, the active phase of labour was monitored strictly with the help of the partograph. In the control group, labour was monitored on the usual lines but the partograph was not used.*
Results: *Use of partogram resulted in statistically significant decrease in use of oxytocin (p value 0.0062), decreased abnormalities of labour (p value <0.0001), significant reduction in the rate of LUCS (p value 0.0004).*
Conclusion: *The partograph helps in early detection of any deviation from normal progress of labour and its use reduces the rate of unnecessary augmentation and caesarean section.*
Keywords: *Partpgraph, Feto-maternal outcome*

Date of Submission: 29-04-2019 Date of acceptance: 13-05-2019

I. Introduction

Partogram is a graphic record of progress of labour and maternal and fetal conditions during labour in a single sheet of paper which is useful in detecting the labour that is not progressing normally at an early stage and helpful in its management. The partogram graphically represents key events in labour and provides an early warning system. Early detection of abnormality and abnormal progress of labour and timely intervention and prevention of prolonged labour would significantly reduce the risk of obstructed labour and other complications associated with it such as sepsis, post-partum haemorrhage, rupture uterus, genital fistula and death. Every day, 1500 women die from pregnancy or childbirth related complications. A woman's lifetime risk of maternal death is 1 in 7300 in developed countries versus 1 in 75 in developing countries [1]. Prolonged and obstructed labour also leads to hypoxia, infection, death and disability of the newborn [2].

The world Health Organisation recommends the use of partograph in labour with a view of improving labour management and reducing maternal and fetal morbidity and mortality [3]. Partogram has been in use in different developed and developing countries of the world since 1970. It serves as an early warning system and assists in early decision making on intervention of labour [4]. Prolonged labour, augmented labour, caesarean section rate and intrapartum fetal deaths are reduced with use of partograph. Thus the use of this inexpensive and effective monitoring tool in labour can make enormous change in feto-maternal morbidity and mortality [5].

II. Aims And Objectives

The objective of this study is
1) Evaluation of the effect of use of partogram in monitoring of spontaneous labour at term with feto-maternal outcome
2) Determination of the incidence of labour dysfunction
3) Reduction in the rate of caesarean section

III. Materials And Methods

This prospective observational comparative study was carried out in the labour room of the department of Gynaecology and Obstetrics of Bankura Sammilani Medical College & Hospital over a period of one year. Mothers, who were admitted with cervical dilatation at 4 cm or more, were included in the study. The patients were randomly allocated to either the study or control group as per computer allocated number. 100 patients were allocated to each group. In the study group, the active phase of labour was monitored strictly with the help of the partograph. In the control group, labour was monitored on the usual lines but the partograph was not used.

Selection of cases: 200 women, both primi and multigravidae at term with singleton pregnancy in active phase of labour of spontaneous onset with vertex presentation and no fetal distress on admission. Women with multiple pregnancy, non-cephalic presentation, history of previous caesarean section, severe maternal disease, fetal distress on admission, gross cephalo-pelvic disproportion, prolonged rupture of membrane and unbooked cases were excluded from the study.

Study technique: After proper counselling and informed consent, mothers fulfilling the inclusion criteria were enrolled and the information was recorded in the pre-designed pre-tested proforma. Close maternal and fetal monitoring done and observations were plotted on the partograph. Early diagnosis of fetal distress and prolonged labour were done and managed accordingly. Mode of delivery, birth weight, sex, APGAR score at 1 & 5 minutes, maternal and perinatal morbidity and mortality and complications of labour were recorded.

Study tools: Pre-designed pre-tested proforma, W.H.O. modified partograph, Hb%, PPBS, ABO grouping & Rh typing, VDRL, HBsAg, ICTC, Urine for protein, acetone

Parameters assessed: Particulars for identification of the patient, date and time of admission of mother, fetal heart rate, status of membranes, colour of liquor amnii, degree of moulding of fetal skull, dilation of cervix, descent of fetal head, frequency of uterine contractions, oxytocin use, drugs and IV fluids, maternal pulse, B.P., temperature, urine protein, acetone and volume.

IV. Results And Discussion

Statistical analysis was performed by using the STATISTICAL PACKAGE OF SOCIAL SCIENCE Version 20 (SPSS). Statistical analysis was done by means, standard deviations and frequencies. Significance of different variables was performed by chi-square test, t-test in different variables and p value less than 0.05 is considered as significant.

Figure 1: bar diagram showing distribution of mothers according to requirement and nature of augmentation (n=200)

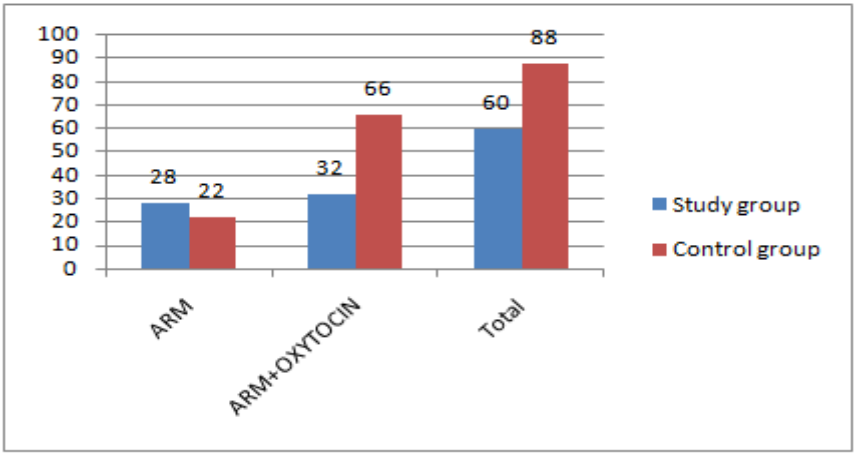

Figure 1 shows distribution of mothers according to requirement and nature of augmentation. Among the 100 mothers in the study group 28 required only ARM and among the 100 mothers in control group 22 required only ARM. In the study group 32 mothers required oxytocin augmentation along with ARM, but in the control group 66 mothers required oxytocin augmentation along with ARM. So, there is significant decrease in the use of oxytocin (p value 0.0062) in the study group.

Figure 2: Bar diagram showing distribution of mothers according to abnormalities occurred in labour (n=200)

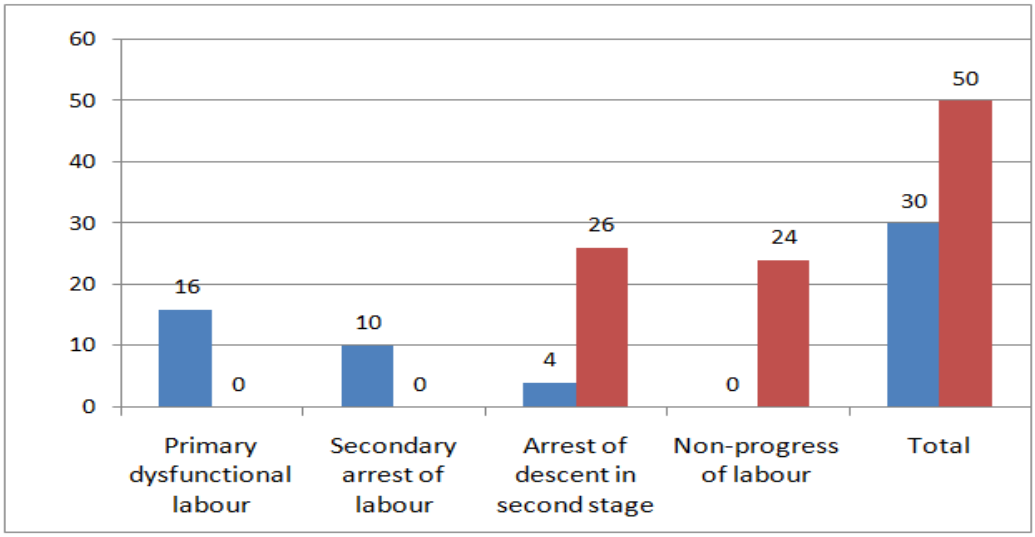

Figure 2 shows the distribution of mothers according to abnormalities occurred in labour. Among the 100 mothers in the study group 16 mothers had primary dysfunctional labour, 10 had secondary arrest of labour and 4 had arrest of descent in second stage. There was no non-progress of labour in the study group. In the control group, out of 100 mothers, 26 mothers had arrest of descent in second stage and 24 had non-progress of labour. So, there is decreased abnormalities of labour in the study group (p value <0.0001).

Table 1: Distribution of mothers according to mode of delivery (n=200)

MOD	Study group		Control group		P value (Chi-square test)
	No.	(%)	No.	(%)	
VD	84	84	62	62	0.0005 (significant)
LSCS	10	10	30	30	0.0004 (significant)
Forceps	6	6	8	8	0.5789 (non-significant)
Total	100	100	100	100	

Table 2: Distribution of mothers according to duration of labour (n=200)

Duration (hours)	Study group		Control group		P value (Chi-square test)
	No.	(%)	No.	(%)	
<4	26	26	6	6	0.0001 (significant)
4-6	20	20	18	18	0.7184 (non-significant)
>6-8	34	34	20	20	0.0258 (significant)
>8-10	14	14	24	24	0.0714 (non-significant)
>10	6	6	32	32	Less than 0.0001 (significant)
Total	100	100	100	100	

Table 3: Distribution of perinatal deaths according to cause

Cause of perinatal death	Study group	Control group
Birth asphyxia	0	3
Septicaemia	2	3
Others	0	2
Total	2	8

Table 4: Distribution of mothers according to maternal complications (n=200)

Maternal complications	Study group	Control group
Major vaginal laceration and hematoma	2	6
Primary PPH	2	8
Retained placenta	0	2
Total	4	16

From the preceding tables it is evident that use of partograph has positively influenced labour outcome in patients in the study group. In the study group, 28% patients required augmentation with only ARM, whereas in the control group 22% patient required augmentation with only ARM. On the other hand, in the study group, only 32% patients required oxytocin in association with ARM, whereas in the control group this number has been increased to 66%, which matches the current scenario in the institution. 40% patients in the study group and 12% patients in the control group required no augmentation. So, there is statistically significant decrease in use of oxytocin (p value 0.0062). Thus, the number of patients requiring augmentation was higher in the control group by 28%, indicating that partographic monitoring has prevented unnecessary augmentation of labour in the study group. In a study conducted by Studd et al [6] the researchers augmented 36% of primigravidae and 13% multigravidae, whereas O'Driscoll [7] augmented 55% of primigravidae with oxytocin. This is well established that dysfunctional labour, which was diagnosed by partogram after surgical and medical augmentation showed better outcome in relation to approach to abnormalities of labour and foetal outcome. A study that was conducted by Dujardin B et al [8] performed amniotomy and oxytocin augmentation in half of the deliveries which crossed the alert line.

A descriptive study was conducted by Hunter DJ, Enkin MW, Sargeant EJ, Wilkinson J et al in 300 consecutive spontaneous labour in primigravidae of 37 or more weeks of gestation with a singleton fetus in vertex presentation. The labours were monitored with partograph and the effect of oxytocin administration on labours prolonged by 4 hours was studied. The study suggested that oxytocin administration when labour is prolonged by 4 hours will reduce the need for caesarean section [9].

Incidence of caesarean section in the study group was 10% and in the control group was 30%. Caesarean section rate of different studies were Ledge and Whitting (1972) – 14% [10], O'driscoll (1969) – 20% [11], O'driscoll & Stronge (1975) – 55% [12]. Incidence of arrest of descent was 5-6% in a study carried out by Friedman[13] [14]. Secondary arrest, which occurs in 5–10% of labours was found in most series of Bottoms and associates [15]. Many authors have reported protracted cervical dilatational abnormalities are more common than descent abnormalities [16].

The perinatal mortality rate in our study group was 20 per 1000 live birth whereas in the control group it was 80 per 1000 live births. Thus there was decrease in perinatal mortality rate in the study group due to use of partograph and proper supervision. Analysis of perinatal death in a teaching hospital in Dar es Salaam, Tanzania, 1999-2003, showed that incidence of perinatal mortality can be reduced with intrapatum monitoring by partogram [17]. Significant difference was noted in the incidence of primary PPH in the study and control groups. In the study group 2 patients had primary PPH, whereas in the control group 8 patients had primary PPH. Both the patients in the study group who suffered from PPH, had primary dysfunctional labour and the combined duration of 1^{st} and 2^{nd} stage in these patients exceeded 10 hours despite augmentation. Shinde et al [18] reports a maternal morbidity of 3.52% in cases having normal labour pattern whereas, it was 53.33% in cases with abnormal labour pattern. Khan and Rizvi [19] found that partograph prevented rupture uterus in planned labour after caesarean delivery. Javed et al [20] found that by using partograph, frequency of postpartum haemorrhage, rupture uterus and puerperal sepsis was reduced.

Thus, by the use of partograph, diagnosis of abnormal labour patterns was more specific, earlier and easier in the study group, thereby facilitating further management. The partograph allows early detection of abnormalities in labour so that necessary intervention can be done. It helps to reduce the overall duration of active phase of labour and enables better management of labour, so that the neonatal outcome is also improved. The incidence of instrumental delivery is also higher without the use of partograph. Caesarean section was done in 10 patients in the study group, compared to 30 patients in the control group. So, there was significant decrease in the rate of caesarean section with use of partograph (p value 0.0004).

Limitations of study

Sample size was small with short duration of study on uncomplicated primigravida. Second stage of labour could not be monitored with partogram. Neonates were not followed to monitor their developmental milestones.

V. Conclusion

The partograph is a simple graphical representation of the major events in a labouring woman and enables relevant fetal and maternal parameters to be viewed at a glance. The cervicograph is the most important component of the partograph and the curve of cervical dilatation enables early detection of specific abnormalities in labour, so that timely intervention can be done. The number of operative interventions is reduced if labour is monitored with the help of the partograph. Incidence of instrumental deliveries and caesarean section is thereby reduced. Active management of labour with partographic guidance helps in reducing the duration of active phase of labour. Incidence of prolonged labour with its sequelae is thereby reduced, including complications like postpartum haemorrhage.

Ethical compliance

All procedures followed were according to the ethical standards of the institutional ethics committee and with the Helsinki declration of 1975, revised in 2008. Informed consent was obtained for each subject for being included in this study.

Conflict of interest

The authors declare that they have no conflict of interest

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Dr. Partha Pratim Sinhababu[1]. "Implementation of Partograph in Monitoring Of Active Phase of Spontaneous Labour at Term and Its Effect on Feto-Maternal Outcome." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 5, 2019, pp 01-05.