

Role of partogram in preventing prolonged labour

Iffat Javed, Shereen Bhutta, Tabassum Shoaib

Jinnah Postgraduate Medical Center, Karachi.

Abstract

Objective: To determine the effect of partogram on the frequency of prolonged labour, augmented labour, operative deliveries and whether appropriate interventions based on the partogram will reduce maternal and perinatal complications.

Method: A case controlled, prospective and interventional study on 1000 women in labour was carried out in the obstetric unit of Jinnah Post graduate medical center, Karachi, from 1st July to 30th December, 2002. Five hundred women were studied before and after the introduction of partogram. Duration of labour, mode of delivery, number of cases augmented and neonatal outcome were noted

Results: Labour was shorter than 12 hours in 80.8% primigravida, 18.4% had labour shorter than 24 hours and only 0.8% had labour longer than 24 hours. After introduction of partogram 91.6% delivered within 12 hours and rest (8.4%) delivered within 24 hours. Normal vaginal delivery was had in 88%, 5.6% had operative vaginal delivery and 6.4% had caesarean section. Introduction of partogram showed significant impact on duration of labour ($p < 0.001$) as well as on mode of delivery ($p < 0.01$). In multigravidae 94.4% delivered within 12 hours and rest 5.6% delivered within 24 hours when partogram was used while 88.4% delivered within 12 hours and the rest 11.6% within 24 hours before the use of partogram. Partogram showed significant reduction in duration of labour ($p < 0.01$). Results also showed significant reduction in number of augmented labour ($p < 0.001$) and vaginal examinations ($p < 0.001$).

Conclusion: By using partogram, frequency of prolonged and augmented labour, postpartum haemorrhage, ruptured uterus, puerperal sepsis and perinatal morbidity and mortality was reduced (JPMA 57:408:2007).

Introduction

Labour has been termed the most dangerous journey a human ever under takes. The reason being that although it is a natural process but complications can arise at any time during its course. Maternal mortality remains between 500.¹ and 1000 deaths for 100,000 live births in developing countries. A major cause of these deaths is prolonged obstructed labour primarily because of cephalopelvic disproportion. In those who survive, morbidity is significant due to complications like sepsis, postpartum haemorrhage, ruptured uterus and urinary fistula. Obstructed labour is also a major precedent of perinatal deaths, birth asphyxia and neonatal sepsis.

The partogram initially introduced by Philpott² and endorsed by WHO is a simple and accurate instrument for early recognition during labour. This makes timely remedial intervention possible and alters the maternal and foetal outcome favourably. This study was undertaken to validate this claim in a tertiary care public hospital where junior doctors and midwives undergo training under supervision.

Subjects and Methods

It was a case control, prospective and interventional study and was carried out in obstetric unit of Jinnah Post Graduate Medical Centre, Karachi, from 1st July to 30th

December, 2002. Of the 1000 women in labour included in the study, 500 women were studied as controls before and 500 after the introduction of partogram. Among each group 250 were primigravidae and 250 were multigravidae. The following data was collected prospectively: Duration of labour, mode of delivery and complications during and after delivery. Number of cases augmented, number of vaginal examinations and neonatal outcome was noted. Then partogram was introduced to the staff through presentations and lectures. Then same data was collected prospectively on 500 women. Only singleton pregnancies with spontaneous labour at term were included. The data was analyzed by using SPSS version-10.

Results

The results were evaluated separately in primigravidae and multigravidae women. Before introduction of partogram (Table-1), 250 primigravidae were studied as controls (group -Ia). Results are compared with 250 women in whom labour was monitored with partogram (group-1b). In patients with normal labour curve vaginal delivery was achieved in 80% women (1a) as compared to 95.6%(1b) before and after partographic monitoring. The rate of instrumental deliveries fell from 5.6% to 1.5% and that of caesarean section from 6.4% to 2.9% making impact on mode of delivery significant.

Table 1. Evaluation of impact of partogram on complication of labour and sequelae in primigravidae,

	Before Introduction of Partogram 1a		After Introduction of Partogram 1b		
Total cases	250		250		
	No	%	No	%	Significance Test
Length of labour					
<12 h	202	80.0	229	91.6	P = 0.001
12-24 h	46	18.4	21	8.4	Chi2 =13.02
>24 h	02	0.8	0	0.0	
Delivery					
* Spontaneous vertex	196	78.4	220	88	P = 0.01
* Operative vaginal	22	8.8	14	5.6	Chi2 =8.50
* Caesarean Section	32	12.8	16	6.4	
Obstructed labor	11	4.4	0	0	P = 0.01 Chi2 = 11.25
Postpartum haemorrhage	12	4.8	0	0	P = 0.01 Chi2 = 12.30
Perinatal mortality	09	3.6	02	0.8	P = 0.01 Chi2 =4.55

Table 2. Evaluation of impact of partogram on complications of labour and sequelae in multigravidae.

	Before Introduction of Partogram 2a		After Introduction of Partogram 2b		
Total cases	250		250		
	No	%	No	%	Significance Test
Length of labour					
< 12 h	221	88.4	236	94.4	P = 0.01
12-24 h	29	11.6	14	5.6	Chi2 = 5.7
>24 h	0	0	0	0	
Delivery					
* Spontaneous vertex	223	89.2	230	92	P = 0.53
* Operative vaginal	16	6.4	11	4.4	Chi = 1.23
* Caesarean section	11	4.4	09	3.6	
Obstructed labor					
Obstructed labor	05	02	0	0	P = 0.07
Uterine rupture					
Uterine rupture	02	0.8	0	0	P = 0.47
Postpartum haemorrhage					
Postpartum haemorrhage	05	2	01	0.4	P = 0.21
Perinatal mortality					
Perinatal mortality	04	1.6	01	0.4	P = 0.36

(p<0.01). Introduction of partogram also showed a significant impact on duration of labour (p<0.001).

In second stage, 6 patients (2.9%) with normal

labour curve were augmented. Out of these, one (16.6%) had caesarean section, three (50%) had instrumental deliveries and 2 (33.4%) had normal vaginal deliveries. Twenty nine patients who moved between alert and action line (11.6%), were all augmented. Twenty one (72.4%) patients delivered normally, 4 patients (13.8%) had instrumental deliveries and 4 (13.8%) had caesarean section. Results show significant impact on mode of delivery when progress was normal (p<0.001) or moved between alert and action line (p<0.001). Eleven patients crossed the action line (4.4%). Their labours were augmented, 2 (18%) had normal vaginal deliveries, 5 (45.6%) had instrumental deliveries and 4 (36.4%) had caesarean section. This distribution was found to be statistically not significant (p<0.38). Four patients had prolonged latent phase. After augmentation 2 patients (50%) had instrumental deliveries and 2 (50%) had caesarean section. These results were not significant (p<0.22). Introduction of partogram showed significant reduction in number of augmented labours (p<0.001) and vaginal examinations (p<0.001). Frequency of obstructed labour and PPH also decreased from 4.4% and 4.8% to 0% respectively. Result were statistically significant (p<0.001).

Before introduction of partogram, 48 (9.6%) babies needed resuscitation with Apgar score less than 6. This need for resuscitation dropped to 21 (4.2%) in those delivering with partographic monitoring. Two fresh stillbirths and 7 neonatal deaths occurred in group (1a) and there were two fresh stillbirths in group 1b. Perinatal mortality decreased from 3.6% to 0.8% showing significant impact of partogram on neonatal outcome (p<0.03).

In multigravidae, comparison between the two groups regarding duration of labour and mode of delivery is shown in Table 2 .Normal labour curve was seen in 217 patients (86.8%), in group 2b .Of these 208 patients (95.5%) had normal vaginal delivery, 5 (2.3%) had instrumental deliveries and only 4 (1.8%) had caesarean section. Eight (3.7%) patients were augmented in second stage of labour. Of these 2 had caesarean sections, 2 had instrumental deliveries and 4 had normal deliveries. Twenty one (8.4%) patients moved between alert and action line. They were all augmented. 16 (76.2%) patients delivered normally and 3 (9.5%) had caesarean section. The patients who had normal labour and who crossed alert line showed significant impact on mode of delivery (p=0.001). Nine patients (3.6%) crossed the action line. Three patients (33.3%) had caesarean section, 2 (22.2%) had operative vaginal delivery and 4 (44.5%) delivered normally. This distribution was found to be statistically insignificant. Three (1.2%) patients did not progress beyond the latent phase and were augmented. One patient (33.4%) had operative vaginal delivery and 2 (66.6%) had normal vaginal delivery.

With the use of partogram the duration of labour was less than 12 hours in 236 patients (94.4%), 14 (5.6%) delivered within 24 hours and none took more than 24 hours (Table 2). Without the partogram, 88.4% delivered within 12 hours and 11.6% within 24 hours. Partogram showed a significant reduction in duration of labour ($p<0.01$).

The use of partogram resulted in a significant reduction in the number of augmented labour ($p<0.001$) and vaginal examinations ($p<0.001$). However there was no significant impact on mode of delivery ($p=0.53$), complication of labour and neonatal outcome ($p=0.36$).

Discussion

Partogram is a simple and efficient method of preventing prolonged labour and its complications. This is very useful in a third world country like Pakistan where there is scarcity of resources. In Pakistan, one of the four common causes of maternal death is obstructed labour, while in Balochistan it is the leading cause.³ A study carried out in a Nigerian hospital⁴ showed an incidence of 17.8% and 6% in Bangladesh.⁵

In our unit of Jinnah Postgraduate Medical Centre there were 3911 deliveries in the year 2002. There were 28 maternal deaths in last year and 37.2% were due to obstructed labour. Maternal mortality rate was 7/1000 live births.

Duration of labour did not exceed 24 hours even before the use of partogram because most of the patients were augmented indiscriminately due to lack of scientific monitoring. Oxytocin requirement decreased because progress of labour was adequate. Augmentation was started at the first sign of deviation from normal pattern i.e. 2 hours beyond alert line. O'Driscoll⁶ et al. advocated augmentation when the progress of labour is less than 1cm/hour. Others being less stringent advocate augmentation when the progress has deviated to the right of action line giving 2,3 or 4 hours period of grace. In our study caesarean section rate fell from 4.4% to 3.6% multigravidae and from 12.8% to 6.4% in primigravida. The major cause for caesarean section in primigravida was cephalopelvic disproportion (CPD) which could be attributed to malnourishment leading to a smaller pelvis. O'Driscoll and co-workers,⁶ in a study of 1000 consecutive cases, showed an incidence of CPD of 1% and no cases of uterine rupture in primigravida patients. In our study there were 2 cases of uterine rupture in multigravidae who had received augmentation with more than required dose of oxytocin and for a longer time. In one patient rupture was diagnosed immediately. Laparotomy was done and we were able to save the baby. The other unfortunate patient was diagnosed late and she had a fresh stillbirth. In a study conducted at a tertiary care hospital⁷ on

patients with previous section, there were seven cases of scar dehiscence while they were monitored with partogram. Chazotte and Cohen⁸ have commented that "arrest disorders might indicate or predispose a patient to uterine rupture, a trial of labour should be discontinued if there is no prompt response to uterine stimulation".

In a WHO multicenter trial in Southeast Asia involving 35,484 women⁹ introduction of the partogram with an agreed labour management protocol significantly reduced both prolonged labour (from 6.4 to 3.4% $p=0.002$) and the proportion of labours requiring augmentation (from 20.7 to 9.1% $p=0.023$). Emergency caesarean sections fell from 9.9% to 8.7% and intrapartum stillbirths from 0.5% to 0.3%.

It is disputed that active management increases perinatal risk. In a study¹⁰ neonatal asphyxial seizures were 2.3/1000 with active management as compared to 1.3/1000 without such management. However some other studies¹¹ showed no such difference. In our study there was no obvious effect of oxytocin on neonatal outcome.

The frequency of vaginal examination was also dramatically reduced. These were done after every 4 hrs when labour was not stimulated and every 2 hours after augmentation. This reduces puerperal sepsis while improving neonatal outcome and speedy recovery of the mother. A study on prolonged labour carried out in India¹² showed that more than 85% cases were grossly infected at the time of admission because of repeated vaginal examinations by dais.

Conclusion

The study concluded that partogram was a very useful tool. Its use reduced caesarean sections, operative vaginal delivery, rate of augmented labours, complications of labour, puerperal sepsis, maternal mortality and morbidity.

Recommendation

It is recommended that implementations of partogram should be encouraged in all hospitals at all levels, and nurses and midwives should be trained to use it for better results.

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