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Original Research Article

"Routine Partographic Assessment of Progress of Labour & Pregnancy Outcome"

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Abstract

Background: Partograph is a simple, of low cost but most important tool for record of progress of labour In the developing country like ours, where both pregnancy and maternal mortality rate is so high, the use of this inexpensive partograph is essential. ***Objective:*** To assess the importance of partographic control of labour in preventing prolongs labour and its consequences, thereby decreasing maternal morbidity and mortality and improvement of neonatal outcome. ***Method:*** This study was done in the Obstetrics and Gynaecology department of Institute of Child and Mother Health, Matuail, Dhaka. Total 196 patients were included in this study. Data were collected by predesigned data collection sheet. Data were analyzed by using Statistical Package for Social Science (SPSS) version 14. ***Result:*** 74% of these patients had spontaneous vaginal delivery, 7.14% required assisted delivery (forceps or ventouse) and 18.9% needed caesarean section. Caesarean section was done in 18.9% patients because of fetal distress (32.4%) and prolonged labour (67.6%) due to malrotation and cephalopelvic disproportion. Patients with non-engaged head in labour required more intervention than who had engaged head. With the use of partograph, unnecessary interventions were reduced. It was found that 66.7% of the patients were delivered within 7 hours and all patients were delivered within 10 hours from active phase of labour. Thus prolonged labour and its consequences, such as obstructed labour and ruptured uterus, can be avoided by using partograph. In 100% of the patients, crossing the action line in partograph required interference, but 92.5% within alert line of partograph delivered vaginally spontaneously and 7.5% required assisted delivery (forceps or ventouse). When IDR was 1 cm/hr 85.1% women delivered spontaneously. When IDR was <0.4 cm/hr, 100% of patients required some kind of interference. Thus, the maintenance of partograph in labour enables the obstetricians to recognize very early dystocic labour and act accordingly. ***Conclusion*:** With the help of a partogram, time of delivery can be estimated and if the progress is slow, an appropriate interference at the right time can be instituted before the labour becomes dangerously protracted. IDR very helpful in making early decisions about the prognosis for the type of labour. With the use of partogram and its scientific application, the result showed that operative interventions were reduced, duration of labour was within normal limit and there was no obstructed labour and no maternal or perinatal mortality.

Keywords: Routine Partographic, Progress Of Labour, Pregnancy Outcome.

INTRODUCTION

Pregnancy is not a disease but a natural process. However, birth is a critical time for the mother & fetus. Delays in receiving effective care during labour & at birth may be fatal for the mother & fetus. Approximately half a million women lose their lives each year because of complications of pregnancy and huge numbers are left with painful injuries as a result of obstructed or prolonged labour during childbirth. About 99 percent of these occur in the developing countries [1]. Tragically millions of stillbirths and newborn death result from same preventable causes [2]. International Federation of Gynecology and Obstetrics (FIGO) estimates that approximately 2 million babies die each year because of complications of childbirth, among them 1.02 million are still births and 904000 are intrapartum related neonatal death[3]. Most of the burden (99%) of maternal mortality and morbidity occurs in low & middle income countries. Intrapartum related neonatal mortality rates are 25 fold higher in the low income countries and still birth rates are up to 50

fold higer[3]. Bangladesh is a densely populated country. More than 80 percent people live in rural areas, about 71% delivery at home and only 29% of birth occurred at a health facility (12% in a public facility, 15% in a private facility, and 2% in an NGO facility)[4]. Bangladesh demographic and health surveys (BDHS, 2011) shows that only 53.7% of urban and 25.2% of rural women take assistance at delivery from qualified doctor, trained nurses/ midwives/ paramedics, FWV or CSBA[4]. The high rate of maternal and perinatal morbidity and mortality is largely a consequence of poorly managed pregnancies and labour. In Bangladesh, 1.94 mothers die per 1000 live births from complications of pregnancy, childbirth and 7% of these deaths are due to prolonged and obstructed labour (BMMS 2010)[5]. Maternal mortality and morbidity is a serious concern in Bangladesh. In Bangladesh one newborn dies in every 3.4 min and there is one maternal death for every 14 perinatal death of the estimated 3.8 million babies born each year, 1, 00,000 are still born and 1, 50,000 die in first month [6]. Labour is said to be prolonged when combined duration of first and second stage is more than arbitrary time limit of 18 hours [7]. Obstructed labour is one where in spite of good uterine contraction the progressive descent of presenting part is arrested due to mechanical obstruction [8]. Among the causes of maternal morbidity and mortality prolonged labour and obstructed labour account for about 8% of direct maternal death in developing countries [9]. Prolonged labour and obstructed labour affect both mother and fetus. There is increased morbidity and mortality due to maternal dehydration, exhaustion, genital sepsis, injury to genital tract including ruptured uterus. Obstructed labour also causes genital prolapse, genital fistula, vaginal stenosis, secondary infertility in surviving women. According to some estimates in Africa many women more than a million women survive obstructed and prolonged labour only to suffer obstetric fistula which often leads to a women's rejection by her partner, family and society leaving her destitute & ashamed[10]. The partograph is the graphical recording of progress of labour and salient features of mother and fetus has thus become necessary part of the partograph. Its central feature is the graphical recording of cervical dilatation, the descent of the fetal head and the uterine contraction which are the indicators of progress of labour. It has been introduced in a number of countries since 1970 but used extensively in a few[7]. It has been used to detect labour that is not progressing normally, to indicate when augmentation of labour is appropriate and to recognize cephalopelvic disproportion long before labour becomes obstructed [8]. One of the concerns of World Health Organization (WHO) is that caesarean section may be used unnecessarily in many health facilities. Rates of caesarean delivery has gone up around the world, increasing health risks to women but showing little evidence of better rate of fetal survival . According to WHO the partograph has potential not only to reduce fetal and maternal morbidity and mortality but also to reduce rising tide of caesarean deliveries [8]. In Institute of Child & Mother Health (ICMH) each year, near about 6,000 deliveries are conducted with about 50% caesarean section [11]. Previously, partograph was used irregularly in this hospital. The present study was conducted to evaluate the impact of regularly implementing WHO modified partograph in labour management at ICMH. The prime aim of the study was to assess the outcome of implementation of WHO modified partograph in labour management in the department of Obstetrics and Gynaecology, Institute of Child & Mother Health (ICMH) with special interest to prevent prolong labour and obstructed labour.

MATERIALS AND METHODS

This was a hospital based Observational descriptive study was carried out in the Department of Obstetrics and Gynaecology, Institute of Child & Mother Health (ICMH), Matuail, Dhaka, Bangladesh from 1st June 2010 to 30th November 2010. 196 patients included in our study. All the patients who were predicted to deliver vaginally were included in the study.

INCLUSION CRITERIA

- Parturient of any age group
- Both primigravida and multigravida
- Spontaneous labour in term pregnancy
- Singleton pregnancy with vertex presentation
- Gestational age 37 completed weeks
- Cervical dilatation of 4 cm. i.e. at beginning of active stage
- No other associated complications.

EXCLUSION CRITERIA

- History of previous C/S
- Eclampsia
- Antepartum haemorrhage
- Malpresentation
- Multiple pregnancy
- IUD
- Post term pregnancy (after 42 week).

Procedure Followed

Pregnant women coming to the hospital in labour or starting labour in the hospital for normal delivery were included. After taking history with particular attention to aspects relevant to this study, clinical examinations were carried out. Labour was diagnosed on the basis of regular, recurrent painfiel uterine contraction, progressive cervical dilatation, show and rupture of memorane or formation of bag of water. Partographic recording was started for all women in labour. The frequency and strength of uterine contractions were studied half hourly in the active phase and the number of contractions in 10 minutes and strength of contractions were recorded. Fetal monitoring was done by auscultating fetal heart sound by stethoscope and seeing colour of the liquor if

membrane is ruptured. Fetal heart sound was heard immediately after contraction has passed and at 30 minutes interval and re-recorded on the graph. A detailed vaginal examination was done on admission, from 4 to 10 cm (full dilatation) is in the ACTIVE phase and should progrees more rapidly, normally at 1 cm every hour. Per vaginal 1 examination was done at an interval of 4 hours and more frequently in the later part of the active stage of cervical dilatation especially (a) Following rupture of the membranes to exclude cord prolapsed where the head is not yet engaged. (b)Whenever any interference is contemplated. And (c) To confirm the actual coincidence of bearing down efforts with complete dilatation of the cervix and to diagnose precisely the beginning of second stage. Uterine contractions and moulding of the fetal head was also assessed. Before each vaginal examination, the level of the fetal head was assessed in fifths by abdominal palpation and was recoded with and 'O' on the appropriate line of the chart. Maternal pulse rate was recorded every half hour, blood pressure and temperature once every 4 hours or more frequently, if indicated. Volume of urine passed was noted and estimation of sugar and protein in urine were done in selected cases especially GDM and PET. Analgesics, intravenous fluid, strength and rate of oxytocin drip, all that were used, also recorded in the partogram. A female relative was allowed to stay with the patient in the first stage of labour. Injection pethidine 50-75 mg intramuscularly was used as pain killer when the pains are well established in the active phase of labour. When the progress of labour was not satisfactory or contractions were not good enough as reflected by the partograph, acceleration of labour by oxytocin was done. The labour was managed according to the standard practice. The length of labour was carefully noted with mode of delivery and the condition of baby determined by Apgar score. A 5 minute Apgar score < 6 was regarded as abnormal. The initial dilatation rate (IDR) in cm/hr was calculated on the basis of increase in the cervical dilatation at the next vaginal examination.

DATA COLLECTION AND ANALYSIS

Data for individual study subjects were recorded on a predesigned data collection sheet (Appendix). Parameters for which statistical analysis done age of the patient, gestational age, cervical dilatation, engagement, mode of onset of labour, augmentation, duration of active phase, second stage and total duration of labour, mode of delivery and their indications, mean IDR and neonatal outcome. Collected data were compiled and appropriate statistical analyses, such as Z- test, Chi-square test and unpaired Student's "t" test were done using computerbased software. Statistical Package for Social Science (SPSS). P value<0.05 was taken as minimum level of significance.

RESULTS

Table-1: Age Distribution of the patients in relation to Parity (n=196)

Age Group (Years)	Parity				Total	P- value
	Primiparous (n=116)		Multiparous (n=80)			
	No	%	No	%		
16-20	67	(57.7)	3	(3.75)	70	.00031***
21-25	39	(33.6)	31	(38.75)	70	
26-30	9	(7.8)	35	(43.75)	44	
>30	1	(0.9)	11	(13.75)	12	
Total	116		80		196	
Mean± SD	20.98±3.05		27.15±4.32			.00031***
Range	16-34		18-39			

Chi-square test/Unpaired Student's 'l' test
***=significant

Table-1 shows that majority of primi patients was in age group 16-20 years; on the other hand, majority multi patients fall into age group 26-30 years.

Table-2: Distribution of the Gestational age of the patients in relation to Parity

Gestational Age(weeks)	Parity				Total	P-value
	Primiparous (n=116)		Multiparous (n=80)			
	N	%	N	%		
37-38	39	(33.6)	26	(32.5)	65	0.282 ns
>38-40	70	(60.3)	44	(55.0)	114	
>40-42	7	(6.0)	10	(12.5)	17	
Total	116		80		196	
Mean + SD	38.98+1.15		39.05+1.20			0.282 ns
Range	37-42		37-42			

Chi-square test/Unpaired Student's't' test
Ns=not significant

Table-2 shows that the patients were 37-42 weeks pregnant with preponderance of 38+ to 40 weeks in both primi and multiparous group.

Table-3: Distribution of Duration of active phase (in hours) of labour in relation to Parity

Active phase(hours)	Parity				Total	P-value
	Primiparous (n=87)		Multiparous (n=72)			
	N	%	N	%		
1-4	35	(40.2)	48	(66.7)	83	0.001***
>4-7	44	(50.6)	16	(22.2)	60	
>7-10	8	(9.2)	8	(11.1)	16	
Total	87		72		159	
Mean - SD	4.59+1.98		4.05+2.20			0.170 ns
Range	1.0-10		1.5-9.78			

Chi-square test/Unpaired Student's't' test
***= significant, ns-not significant

Table-3 shows that active phase of labour in majority primiparous women lasted longer than 4 hours (50.6%) but most of the multiparous women (66.7%) completed their active phase within 4 hours.

Table-4: Total Duration of labour (from active phase to end of second stage) in relation to Parity

Total Duration(hours)	Parity				Total	P-value
	Primiparous (n=87)		Multiparous (n=72)			
	N	%	N	%		
≤3	6	(6.9)	13	(18.0)	19	0.064 ns
>3-7	59	(67.8)	47	(65.3)	106	
>7-11	22	(25.3)	12	(16.7)	34	
Total	87		72		159	
Mean - SD	38.3913.32		23.98+13.70			0.005***
Range	1.0-10		1.5-9.78			

Chi-square test/Unpaired Student's't test
** - significant, ns not significant

Table-4 shows that 67.8% primiparous and 65.3% multiparous women completed their delivery within 7 hours.

Table-5: Mode of delivery/outcome of progression of labour in relation to alert and action lines

Progress of labour	Normal Vaginal Delivery		Assisted Vaginal Delivery		LSCS (n=37)		Total	P-value
	No	%	No	%	No	%		
Within alert line (n=120)	111	(92.5)	9	(7.5)	0		120	0.00012***
Outside alert line (n=66)	34	(51.5)	5	(7.6)	27	(40.9)	66	
Outside action line (n=10)	0		0		10	(100)	10	
Total	145		14		37		196	

Chi-square test
***= significant

Table-5 shows that (92.5%) cases falling within alert line had vaginal delivery and none had LSCS. Cases falling outside alert line had lower rate of vaginal delivery (51.5%) and LSCS rate was (40.9%). Among the cases falling outside action line, none had vaginal delivery and all 10 cases needed LSCS.

Table-6: Outcome of labour in relation to IDR (initial dilatation rate of cervix) group (cm/hr)

IDR Group (cm/hr)	Normal Vaginal Delivery		As Vaginal Delivery sisted		LSCS		Total	P-value
	No	%	No	%	No	%		
≤ 0.4 (n=9)	0		0		9	(100.0)	9	0.00054
>0.4-0.9 (n=62)	32	(51.6)	4	(6.4)	26	(41.9)	62	
>0.4-0.9 (n=74)	63	(85.1)	9	(14.8)	2	2(2.7)	74	
>1.5 (n=51)	50	(98.0)	1	(1.9)	0		51	
Total	145		14		37		196	

Chi-square test
***= significant

Table-6 shows that when IDR of cervix wa <0.4 cm/hr, 100% cases needed LSCS but when IDR was 1 cm/hr, only 2.7% cases required LSCS. In 98.0% cases, vaginal delivery occurred when IDR was >1.5 cm/hr and none had LSCS.

Table-7: Mode of Delivery and indication of Instrumental delivery and LSCS (n=196)

Mode of Delivery	Number of Patients	Percentage
Normal vaginal delivery	145	73.9
Assisted vaginal delivery	14	7.1
Forceps	1	7.1
Prolonged second stage with fetaldistress	1	100.0
Ventouse	13	92.9
Cut short second stage withmaternal and fetal distress	8	61.5
prolonged second stage	5	38.5
LSCS	37	18.9
Fetal distress	12	32.4
Prolonged labour	25	67.6
Due to malrotation	12	48.0
Due to CPD	13	52.0

Table-7 shows that 74% of these patients had spontaneous vaginal delivery, 7.14% required assisted delivery (forceps or ventouse) and 18.9% needed caesarean section. Caesarean section was done in 18.9% patients because of fetal distress (32.4%) and prolonged labour (67.6%) due to malrotation and cephalopelvic disproportion. Patients with non-engaged head in labour required more intervention than who had engaged head.

Table-8: Neonatal outcome after delivery (n = 196)

Neonatal response	Frequency	Percentage
Spontaneous cry	166	84.7
Cried after resuscitation	24	12.2
Needed admission to SCABU	6	3.1

Table-8 shows that 84.7 percent babies cried spontaneously, 12.2 percent babies needed resuscitation and 3.1 percent newborn needed admission to NICU.

DISCUSSION

This study was conducted among 196 patients who attended the labour ward of Institute of Child and Mother Health (ICMH).The study was aimed to find out the prevalence of prolonged labour. The study also evaluated the maternal and fetal outcome of labour which was monitored by partograph. Primigravida constitute majority of patients 59.2% in the study population. This study is not different from the study of Nargis [12], who observed that 57.5 percent of her study population was primigravida. Most of the primi patients belonged to age group 16-20 (57.7%) and multi-patients in age group 26-30 years (38.7%). Mean (±SD) age of multiparous women was significantly higher compared to primiparous (27.15+4.32 vs 20.983.05) years). This finding is more or less consistent with the findings of Rahman [13], who found 18-23 years as the most common age group (mean+SD 23.76+4.54 years). According to Bangladesh Demographic and Health Survey (BDHS), median age of first pregnancy is 18.3 years in Bangladesh [14]. The lower age group in primiparous women can be explained by sociodemographic character of the patients. Here, most of the patients from low socioeconomic status with poor educational background. Majority of the primi and multi patients (60.3% and 55.0%, respectively) attended the hospital at their 38-40 weeks of gestation. Same observation was shown by Rahman [13] in her study. In this study, 62.1 and 61.2 percent primi and multigravid patients, respectively, attended the labour ward in the active phase of their labour (4-5) cm dilatation). The mean (USD) cervical dilatation of primi and multigravid patients in admission in the present study were 3.58+1.66 and 3.85+1.72 cm, respectively. In a study by Studd [15], admission dilatation was 3.3 and 3.8 cm, respectively. In this study 67.8 percent primigravida and 65.3 percent multigravida completed their delivery within 7 hours. However, 25.3 percent primi and 16, 7 percent multigravida fell within the range of 7-11 hours. In this study 6.8 percent primigravida and 17.9 percent multigravida had labour lasted for less than 3 hours, which differs from that of Rahman's study [13]. Rahman showed that no primi could end their delivery within 3 hours. This is probably due to that Rahman included only those cases which were 3/4 cm dilated on admission, but in this study higher rate of cervical dilatations (4-5cm) were included. In the present study, 73.98 percent patients had spontaneous vaginal delivery; rest had difficult delivery in the form of forceps, ventouse and LSCS. Nasrin [16], in her study showed that 70 percent patients delivered spontaneously and 30 percent needed intervention, which comply with the present study. The incidence of

LSCS was 18.9 percent in this series, which is less than that of Zakia [17] (37.5%) and Saleha [18] (28.2%). It indicates that use of partograph can help to reduce LSCS rate. The present study showed that no LSCS occurred when the cases fell within alert line, and in 92.5 percent cases vaginal delivery occurred. Vaginal delivery rate decreased and LSCS rate increased when the cases crossed the alert line (51.5% and 40.9%, respectively). Outside the action line, there was no vaginal delivery and, all were delivered by Caesarean section. In Philpott's series [19], only 10 percent cases crossing alert line and 21 percent crossing action line required interference. Protiva [20] found 88 percent of cases outside the action line needed intervention. Rahman [21] in his study showed that 23.3 percent cases outside alert line and 100 percent cases outside action line needed LSCS. These differences in observation may be due to inadequate maternal and fetal monitoring system crossing alert/action line which was considered endpoint of intervention. In this study, 100 percent cases needed LSCS when IDR was <0.4 cm/hr. When IDR was 1 cm/hr or more, only 2.7 percent cases required interference in the form of LSCS. Protiva showed 82 percent cases with IDR<0.4 cm/hr needed intervention and none required LSCS when IDR was>1 cm/hr. In this study, 84.7 percent babies cried spontaneously, 12.2 percent cried after resuscitation and only 3.1 percent needed admission to neonatal care unit. There was no stillbirth. In a study by Nargis [12], 71.65 percent cried spontaneously, 21 percent cried after resuscitation and 7.09 percent needed admission to NICU and in a series by Rahman [21], these were 76, 10 and 14 percent, respectively. The study showed that there was a significantly lower incidence of admission to neonatal care unit due to poor Apgar score at birth. This may be due to strict monitoring, timely intervention and improved neonatal resuscitation settings in institution. Incidence of operative delivery in the present study was 26.02 percent. Among them, 18.9 percent required Caesarean section and 7.1 percent needed instrumental delivery (ventouse or forceps). LSCS was done due to fetal distress in 32.4 percent cases. Thirty-one patients (67.6%) underwent Caesarean section due to prolonged labour. Labour was prolonged due to malrotation in 48.0 percent cases and in 52.0 percent cases; it was due to cephalopelvic disproportion.

CONCLUSION

In conclusion, the maintenance of a partogram in labour enables the obstetrician to recognize very early dysfunctional labour. With the help of a partogram, time of delivery can be estimated and if the progress is slow, an appropriate interference at the right time can be instituted before the labour becomes dangerously protracted. IDR is very helpful in making early decisions about the prognosis for the type of labour. With the use of partogram and its scientific application, the result showed that operative interventions were reduced, duration of labour was within normal limit and there was no obstructed labour and no maternal or perinatal mortality.

RECOMMENDATIONS

In the developing country like ours, where both pregnancy and maternal mortality rate is so high, the use of this inexpensive partogram is essential. To implement this, it may be recommended that:

1) The modified WHO partograph should be meticulously filled up and learn how to follow the partograph in all hospitals including medical college hospitals, district hospitals, maternal and child welfare clinics, private clinics, upazila health complexes as well as in private practices.
2) Each and every woman in labour should be supervised by a partogram; it must be used by SBA (skilled birth attendants) paramedics/ midwives / nurses, which will guide them for referral in proper time.
3) All birth attendants, nurses, midwives and doctors should be trained to improve the quality of maternity care.

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