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Original Research Article

Comparison of normal and abnormal labour by using Modified WHO Partograph

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ABSTRACT

Background: Modified WHO partograph is graphical record of maternal and foetal data during progress of labour entered against time on single paper sheet. Entire labour can be interpreted in a glance on the photograph. It helps to detect abnormal progress of labour. It guides obstetrician to decide about the need for augmentation of labour or termination of pregnancy either by instrumental delivery or LSCS and avoids prolong labour before obstruction. The objectives were to study the course of normal and abnormal labour and to evaluate the maternal and perinatal outcome in normal and abnormal labour.
Methods: The prospective observational hospital based study of 200 randomly selected cases coming to sir t hospital, bhavnagar for delivery during September 2016 to August 2017 was done. Progress of labour assessed by use of modified WHO partograph. Various parameters like duration of labour, mode of delivery, maternal and neonatal morbidity were studied.
Results: The average duration of active first stage of labour was 4 hrs 38 mins in normal labour and 7hrs 48 mins in abnormal labour. Arrest of descent was responsible for 40% of abnormal labour. Problems like obstructed labour were avoided by timely intervention in the form of cesarean section and instrumental delivery. Maternal and perinatal outcome were satisfactory.
Conclusions: Routine use of modified WHO partograph helps in early detection of abnormal course in labour. Every women in labour must be benefitted by use of modified WHO partograph for labour monitoring. It assures best maternal and perinatal outcome.

Keywords: Modified WHO partograph, Maternal morbidity, Perinatal morbidity

INTRODUCTION

Half million women dies every year due to pregnancy related complication. Obstructed labour and ruptured uterus accounts for 70 percent of maternal mortality.[1] Early detection of abnormal progress of labor and prevention of prolong labor can significantly reduce it. Monitoring of progress of labor thus plays important role in saving women s life. Partograph is an important tool for monitoring progress of labour. E.A.friedman (1954) from USA first popularized the graph, plotting the cervical dilatation against time.[2] Phillot in 1972 did extensive study in in primi gravid in central and south Africa where he constructed a graph of cervical dilatation against time. He introduce the concept of alert line and action line. The alert line represented as mean rate of progress of the slowest 10% of patient in African population they served. action line drawn 4 hours to the

right of the alert line showing that if patient has crossed action line, active management should be instituted within four hours.[3] This partograph formed the foundation for the WHO model of partograph, which was developed as an international standard in 1988 following the launch of world wide safe motherhood initiative.[4]

Partograph predict deviation from normal labor very early and help in early decision. It has different level of function at different level of health care. It serves as an "early warning system" and assist in early decision on transfer, augmentation and termination of pregnancy. The first WHO partograph covers a latent phase of labor upto 8 hours and an active phase beginning when the cervical dilatation reaches 3 cm. the active phase is provided with an alert line and action line drawn 4 hours apart on the partograph. This partograph is based on the principal that during active labor, the rate of cervical dilatation should not be slower than 1cm/hour. A lag time of 4 hours between slowing of labour and need for intervention is enough to make proper decision. Since a prolonged latent phase is relatively infrequent and not usually associate with poor perinatal outcome, usefulness of recording latent phase in partograph has been questioned. So to decrease this disadvantage The WHO modified partograph was introduced by removing the latent phase and considering the beginning of active phase at 4 cm dilatation of cervix instead of 3cm.[5] In 1969 Hendricks et al demonstrated that in the active phase of normal labor the rate of dilatation of the cervix in primigravida and multigravidae varies little and that there is no deceleration phase at the end of first stage of labor.[6] In 1973, John stud said that retrospective evaluation of partograph showed that it can separate normal labour from labour destinated to results in an abnormal outcome, such as longer first and second stage, greater incidence of instrumental delivery, and babies with low APGAR score.[6] Drouin P conducted a retrospective study of 686 patient and prospective study of 1045 patient at the university center for health science in yaounde, Cameroon, Africa. With the institution of partograph they found that the perinatal mortality decreased by 10 deaths/1000 births. So, they recommended the use of partograph.[8] Vaidya et al showed that 99% of cases delivering before the alert line had normal vaginal delivery and only 1% of them required forceps application. Of the cases falling outside the alert line 70% had normal vaginal delivery, 26% required forceps application and 4 % requires vaccum application. 88% of cases crosses action line requires interference.[8] Shortri AN et al in her study observed that 79.9% primigravidae delivered normal vaginally, 5.7% required cesarean section before alert line was crossed. Finding suggests that operative intervention increase when labour curve moves to right of the alert line and it increase significantly when as labour curve crosses the action line.[10] Sizer and Evan found that second stage partograph is associated with increasing chance of spontaneous vaginal delivery for nullipara, decrease chance of instrumental vaginal delivery and emergency cesarean delivery in nulligravidae.[11] Dangal found that the partograph can be highly effective in reducing complication from prolonged labour for baby and for mother.[12] Ernst found that there was one uterine rupture and 2 maternal deaths before introduction of partograph but none after partograph introduction.[13] Javed in found that by using partograph frequency of prolonged and augmented labour, post partum haemorrhage, puerperal sepsis, and perinatal mortality and morbidity reduced.[14] Windrim reports an increase in cesarean section rate with the use of partograph.[15] Lavender found no evidence of any difference between partograph and no partograph in cesarean delivery and instrumental delivery.[16] The emergency caesarean section rate was reduced in W.H.O. modified partograph as compare to latent phas partograph (8% v/s 12%), thus indicating significant reduction in prolonged labour and foetal distress. Also still birth was less in modified partograph as compare to latent phase 0.5% v/s 2% (P value is >0.05) indicating an improved maternal and neonatal morbidity.[17] Khan and Rizvi found that partograph prevented rupture uterus in planned labour after caesarean delivery.[18]

Present study was carried out with following objectives to study the course of normal and abnormal labour, to study various abnormality of active phase of labour, to evaluate maternal outcome in normal and abnormal labour and to evaluate perinatal outcome in normal and abnormal labour.

METHODS

Present study was a prospective observational study done in the year 2016-17 in Department of Obstetrics and Gynecology, Sir Takhatsinhji hospital, Bhavnagar, India. Study population consist of 200 patients which were randomly selected who were admitted in Gopnath maternity home at Sir T Hospital, Bhavnagar.

Inclusion criteria

Pregnant women with uncomplicated full term pregnancies (37-40 weeks) with vertex presentation in labour in active phase of labour.

Exclusion criteria

Women with medical complication like Anemia, Hypertension, Diabetes and Immune compromised status.

Women with obstetrical complication like Preterm labour, Multiple pregnancy, Ante partum hemorrhage, intra uterine growth restriction, pre mature rupture of membrane, intra uterine fetal death.

The prospective observational study will be carried out for the period of one year in government medical college Bhavnagar. 200 cases admitted to labour room will be randomly selected and monitored using modified WHO partograph. All the cases reporting to labour room

fulfilling the inclusion criteria and suitable for vaginal delivery are included in this study. The course of labour monitored by modified WHO partograph. The cases showing abnormal labour course will re-evaluated by senior obstretician. The decision of operative intervention (instrumental delivery or cesarian section) will be taken by senior obstratician. The new born baby will be managed by neonatologist till their discharge from hospital. Individual partograph will be studied to know the various aspect of course of labour.

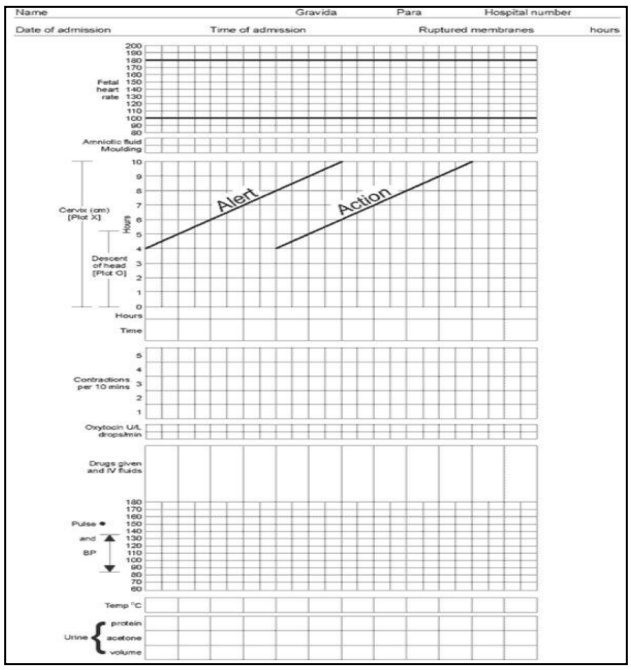

Figure 1: Modified WHO partograph.

RESULTS

Our hospital is tertiary care hospital. Majority of cases are coming from periphery CHC and PHC which comes directly in emergency.

Table 1: Type of admission (N 200).

Type of admission	No. of patient	Percentage
Emergency	125	62.5
Booked	75	37.5

So, in my study 125 cases (62.5%) are emergency cases and remaining 37.5 % are registered. All the patient was examined and include in study randomly who satisfy inclusion criteria.

Table 2: Type of admission (N 200).

Type	No. of patient	Percentage
Rural	156	78
Urban	44	22

Our hospital is tertiary care hospital. So, majority cases are coming from rural area 156 (78%). Remaining 22% were from urban area.

Table 3: Maternal age distribution.

Age (yrs)	No. of patient	Percentage
18-20	25	12.5
21-25	120	60
26-30	46	23
≥31	09	4.5

In present study maximum group of patients observed between 21-25yrs age groups, 60% cases are of this age group. Minimum patients were from age group ≥31 yr responsible for only 4.5% cases.

Table 4: Distribution according to socio economic status.

Socio economic status	No. of patient	Percentage
Lower	117	58.5
Middle	74	37
Upper	09	4.5

In present study majority of cases are from lower socioeconomical status 58.5%. 37% cases were from middle socioeconomical status while only 4.5% cases were from higher socioeconomical status.

Table 5: Maternal parity distribution.

Parity	No. of patient	Percentage
Primigravida	93	46.5
Multigravida	107	53.5

In present study 46.5% cases are primigravidae while remaining 53.5% cases are multigravida. According to that both primi and multigravida women composition is almost same in present study.

Table 6: Causes of abnormal labour.

Cause of abnormal labour	LSCS	Instrumental delivery
Arrest of descent	04	10
Failure of descent	06	04
Protracted descent	02	04
Arrest of dilataion	03	00
Protracted dilatation	02	00

So, most common cause of abnormal labour in present study is arrest of descent of head which is responsible for 40% of abnormal labour. Out of all abnormal labour 51.43% (18 cases) delivered by instrumental delivery while 48.57% (17 cases) required emergency cesarean delivery. Instrumental delivery was not helpful in cases with arrest of dilatation.

Table 7: Distribution according to birth weight.

Weight	Number of patient	Percentage
2-2.499kg	24	12
2.5-2.999kg	84	42
3-3.499kg	70	35
>3.5kg	22	11

So, in present study majority of baby having wt of 2-2.499kg responsible for 42% (84 cases) of all cases. 11% cases having wt ≥3.5kg while 12% cases having wt between 2-2.499kg and 35 % cases having wt 3-3.499kg.

Table 8: Maternal morbidity in case of normal and abnormal labour.

Maternal morbidity	Normal labour (n=165)		Abnormal labour (n=35)	
	No.	Percentage	No.	Percentage
Maternal fever	2	1.21	1	2.85
Wound complication	1	0.6	2	5.71
PPH, Blood transfusion	0	0	1	2.85
Average duration of hospital stay	2 days		6-7 days	
Total	3	1.81	4	11.42

So, in present study only 3 mothers with normal labour having some problems. Remaining are healthy which meant that only 1.81% cases with normal labour develop complication. 4 cases with abnormal labour having problems accounts for 11.42% morbidity in abnormal labour. Average duration of hospital stays increase in case of abnormal labour. Wound complication was most common morbidity in abnormal labour accounting for 5.71% which was only 0.6% in normal labour. Average duration of hospital stays also increased in cases with abnormal labour.

Table 9: Neonatal morbidity in cases with normal and abnormal labour.

Neonatal morbidity	Normal labour Total 165		Abnormal labour, Total 35	
	No.	Percent	No.	Percent
Birth asphyxia	3	1.81	3	8.57
Ophthalmic infection	3	1.81	0	0
Meconium aspiration syndrome	1	0.6	3	8.57
Jaundice	1	0.6	5	14.28
Average Duration of NICU stay	2-3 days		3-4 days	
Neonatal death	0	0	0	0
Total	8	4.84%	11	31.42%

1.81% babies with abnormal labour develop birth asphyxia, while 8.57% babies with abnormal labour labor develop birth asphyxia. 1.81 % babies with normal labour develop ophthalmic infection, while no ophthalmic infection occur in babies with abnormal labor. 0.6% babies with normal labor develop meconium aspiration syndrome, while 8.57% babies with abnormal labor develop meconium aspiration syndrome.

0.6% babies with normal labor develop jaundice, while 14.28% babies with abnormal labor develop jaundice. So, 8 out of 165 normal delivery babies kept in NICU. Accounts for 4.84% NICU admission in normal labour. 11 out of 35 babies with abnormal labour kept in NICU, accounts for 31.42% NICU admission in abnormal labour.

Table 10: Modes of delivery with relation to action and alert line.

Groups	Normal delivery	LSCS	Instrumental delivery
Group 1 (before alert line)	148 (98.6%)	02 (1.3%)	02 (1.3%)
Group 2 (between alert and action line)	15 (55.5%)	03 (11.1%)	09 (33.3%)
Group 3 (after action line)	02 (9.5%)	12 (57.1%)	07 (33.3%)
	165	17	18

Majority of cases before alert line delivered by spontaneous vaginal delivery 148 out of 152 (98.6%). Cases crossing the action line either required instrumental delivery 07 (33.3%) or required LSCS 12 (57.1%). Only 2 cases who crossed the action line delivered normally 9.5%. Total 17 out of 200 required cesarean delivery (8.5% cases) while 18 out of 200 (9% cases) required instrumental delivery.

Table 11: Average duration of stages of labour.

Stages of labour	Normal labour Mean±S.D	Abnormal labour Mean±S.D
1st stage	4hr 38min±1hr 20 mins	7hr 48 mins±2 hrs 47 mins
2nd stage	37.26mins±14 mins	86 mins±49 mins

So, average duration of first stage of labour in normal labour was 4 hrs 38 mins ±1hr 20 mins while average duration of first stage of labour in abnormal labour was 7hr 48 mins ±2 hrs 47 mins.

Average duration of 2nd stage of labour in normal labour was 37.26mins±14 mins, while Average duration of 2nd stage of labour in abnormal labour was 86 mins±49 mins. So, average duration of first and second stage of labour increased in abnormal labour.

Table 12: Comparison of various study of in mode of delivery in relation to action and alert line.

	Group 1			Group 2			Group 3		
	ND	Ins. D	LSCS	ND	Ins. D	LSCS	ND	Ins. D	LSCS
Freidman's study [19]	92.3%	1.5%	6.2%	61.9%	4.7%	33.3%	21.4%	7.1%	71.4%
Shinde et al[20]	96.2%	12%	2.8%	58.3%	25%	16.7%	14.3%	0	85.7%
Javed et al[14]	88%	5.6%	6.4%	72.4%	13.8%	13.8%	18%	45.6%	36.4%
Present study	98.6%	1.3 %	1.3%	55.5%	11.1%	33.3%	9.5%	57.14%	33.3%

Group 1: Befor alert line; Group 2: Between action and alert line; Group 3: After action line

In present study, 98.6% cases (148) before alert line (Group 1) having normal delivery which is comparable with Shinde et al (96.2) and Freidman (92.3%).[19] In present study 1.3% cases (2 cases) before alert line (group 1) required instrumental delivery which is comparable with Freidman's study (1.5%).[19] In present study, 1.3% cases (2 cases) before alert line (group 1) required EMLSCS which is comparable with shined et al (2.8%). In present study, 55.5% cases between action and alert line (group 2) having normal delivery which is comparable with Shine et al (58.5%)and Friedman's study (61.9%).[20] In present study 11.1% cases between action and alert line (group 2) required instrumental delivery which is comparable with Javed et al (13.8%).[14] In present study 33.3 % cases between action and alert line (group 2) required EMLSCS which is comparable with Friedman's study (33.3%). In present study 9.5% cases after action line (group 3) having normal delivery which is comparable with Shinde et al (14.3%). In present study 57.14% case after action line (group 3) required instrumental delivery which is comparable with Javed et al (45.6%). In present study 33.3% case after action line (group 3) required instrumental EMLSCS which is comparable with Javed et al (36.4%)

DISCUSSION

In present study, 37.5% cases were registered for routine antenatal check up while 62.5% cases are referred or direct cases. In present study, 78% cases were from rural area suggesting increase awareness regarding ANC examination and institutional delivery in rural area. Maximum number of patients (60%) in this study belongs to 21-25 yrs of age groups. 58.5% cases belong to lower socioeconomical class, 37% belongs to middle socioeconomical class while 4.5% cases belong to upper socioeconomical class. 46.5% case were primigravida while 53.5% cases were multigravida. Maximum distribution of baby wt was 2.5-2.999 kg (42%) compared to other wt range. In present study 82.5% cases delivered vaginally, 8.5% cases required LSCS while 9% cases required instrumental delivery. Most common cause of abnormal labour in present study is arrest of descent of head which is responsible for 40% of abnormal labour. Instrumental delivery is not helpful in cases with arrest of dilatation and protracted dilatation. Out of all abnormal labour 51.43% (18 cases) delivered by instrumental delivery while 48.57% (17 cases) required emergency cesarean delivery. Protracted dilatation was responsible for 5.71% of abnormal labour in present study. In present study 2 cases (1.21%) with normal labour develop post partum fever and 1 case (60%) develop wound complication. So, only 1.81% cases with normal labour develop complication. 1 case with abnormal labour develop post partum fever, 2 cases with abnormal labour develop wound complication and 1 case with abnormal labour develop PPH and required blood transfusion. So, there is 11.42% morbidity in abnormal labour. Average duration of hospital stays increase in case of abnormal labour. In present study, 8 out of 165 normal delivery babies kept in NICU. Accounts for 4.84% NICU admission in normal labour. 11 out of 35 babies with abnormal labour kept in NICU, accounts for 31.42% NICU admission in abnormal labour. There was no any neonatal or maternal death in present study. Average duration of first and second stage of labour increased in abnormal labour compared to normal labour. Average duration of NICU stay is more in cases with abnormal labour. Total 19 out of 200 cases required NICU admission responsible for 9.5% NICU admission. In present study Majority of cases before alert line delivered by spontaneous vaginal delivery 148 out of 152 (98.6%). Cases crossing the action line required instrumental delivery 07 (33.3%) and LSCS 12 (57.1%). Only 2 cases who crossed the action line delivered normal vaginally 9.5%. In present study, 98.6% cases (148) before alert line (Group 1) having normal delivery which is comparable with Shinde et al (96.2) and Freidman (92.3%). In present study 1.3% cases (2 cases) before alert line (group 1) required instrumental delivery which is comparable with Freidman's study (1.5%). In present study, 1.3% cases (2 cases) before alert line (group 1) required EMLSCS which is comparable with Shinde et al (2.8%). In present study, 55.5% cases between action and alert line (group 2) having normal delivery which is comparable with Shinde et al (58.5%) and Friedman's study (61.9%). In present study 11.1% cases between action and alert line (group 2) required instrumental delivery which is comparable with Javed et al (13.8%). In present study 33.3 % cases between action and alert line (group 2) required EMLSCS which is comparable with Friedman's study (33.3%).[19] In present study 9.5 % cases after action line (group 3) having normal delivery which is comparable with Shinde et al (14.3%).[20] In present study 57.14% case after action line (group 3) required instrumental delivery which is comparable with Javed et

al (45.6%). In present study 33.3% case after action line (group 3) required instrumental EMLSCS which is comparable with Javed et al (36.4%).[14]

CONCLUSION

Partograph was initially used for early warning system to detect labour that was not progressing normally. This would allow for timely transfer to occur to a referrel center for augmentation or caesarean section as required. The Partograph Indicates when augmentation is needed and can point to possible CPD before labour becomes obstructed. It increases the quality and regularity of observation made on mother and fetus and it also serves as a one page visual summary of relevant details of labour. The partograph has been used in number of countries and has been shown to be effective in preventing prolonged labour, in reducing operative intervention and in improving the neonatal outcome. The safe motherhood initiative emphasizes that the partographic monitoring of labour for early detection of abnormal labour is one of the most important approach for reducing maternal and neonatal morbidity. From observation of present study, we conclude that routine use of modified WHO partograph during labour management helps in early detection of abnormal labour, guiding in timely intervention leading to avoidance of problem of prolong labour and its complication. It assures the best maternal and fetal outcome. So, it is suggested that intrapartum monitoring by modified WHO partograph is an important tool in monitoring the progress of labour in PHCS, CHCS and all institutions. Every woman in labour must be benefited by modified WHO partograph.

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