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A study on evaluation of partogram in 100 cases each of primigravida and multigravida with neonatal outcome in labor

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Abstract
Background: Partogragh is a greek word meaning "Labour curve" which is a graphic recording of progress of labour and the maternal and fetal condition during labour against a time scale. It serves as an early warning system and assists in early decision making on transfer, augmentation and termination of labour [1].
Material and Methods: This Prospective randomised comparitive study of 100 cases each of primigravida and multigravida after meeting the inclusion and exclusion criteria. conducted at Al ameen Medical College, Vijayapur for a period of one and half yrs from Dec 2018 to Jan 2020.
All patients, spontaneous or induced labor, in first stage of labor with cervical dilatation more than or equal to 4 cms, singleton pregnancy of more than 36 weeks, in cephalic presentation, without any medical or obstetric complications were included. Partogram was constructed according to WHO guidelines and labor managed accordingly.
Results: Spontaneous labor was 90.5% compared to induced labor which was 9.5% in total. The mean duration of first stage in primi was 5 hrs 10 mins and 4hrs 20min in multi with a statistical significance. The mean duration of second stage in primi and multi were 30.8min and 20.7 mins respectively. Timely intervention in the form of operative vaginal delivery/ LSCS in prolonged labor cases yielded favourable outcome. Neonatal outcome was good in 91% primi and 92% multi , the most common neonatal complication was birth asphyxia.
Conclusion: This study has shown that using the partograph can be highly effective in reducing complications from prolonged labor for both the mother and the neonate. It has shown to be effective in preventing prolonged labor, in reducing operative intervention and in improving the neonatal outcome.

Keywords: partogram, prolonged labor, prevention

Introduction
Labor is a dynamic phenomenon characterized by progressive increase in the frequency, intensity and duration of uterine contractions with progressive dilatation and effacement of the cervix along with the descent of the fetus through the birth canal.
This physiologic process may become pathologic at times and failure to recognize this would result in prolonged labor with resultant increase in the morbidity and mortality of both the mother & fetus. Hence inadequate care during labour results in threats to the life of the mother and the fetus.
Prolonged labour has become a rarity in developed countries but it still poses a problem in developing countries causing increase in maternal and perinatal morbidity and mortatlity.
Prolonged labour is commonly due to cephalopelvic disproportion which may result in obstructed labour, maternal dehydration, exhaustion, uterine rupture, post partum hemorrhage etc. In some, abnormal progress of labour is often due to inefficient uterine contraction [3].
When deviations in labour progress are recognised early and corrected, complications are prevented and normal labour and delivery can occur [2].
The partogram as it is in use today, was first introduced by Friedman in the year 1954. He was the first person to make a graphic display of cervical dilatation against time in labor. He carried out work on a large series of patients and worked out a graphic record of the progress of labor. This was based on the cervical dilatation – time function as Friedman concluded that of all the observable features of labor, cervical dilatation was the most reliable and seemed to reflect the overall progress of the labor best [4]

Plotting cervical dilatation and descent of the presenting part against time allows objective graphic documentation of the progress of labor and simplifies the clinical interpretation of the dynamic changes that occur during labor. Any deviation from the normal curve alerts the attendant to possibility of a labor disorder in advance. It helps not only in recognition but also in characterization and management of dysfunctional labor. Once labor has started it is possible to regulate its duration and progress with almost complete success. This requires as systematic approach with careful diagnosis of the onset of labor, regular assessment and decisive action.

In modern obstetrics hopeful expectancy is replaced by an active and often aggressive management of labor. Hence Partogram can be used as an effective aid for this purpose.

Aims and Objectives

1. To construct a partogram in both primigravida and multigravida.
2. To assess the progress of labor in both primigravida and multigravida.
3. To evaluate the role of partogram in preventing prolonged labor.
4. To evaluate the maternal and perinatal outcome, in primigravida and multigravida, by comparing their partogram in labor

Methods: This Prospective randomised comparitive study of 100 cases each of primigravida and multigravida conducted at Al Ameen Medical College, Vijayapur for a period of one and half yrs from Dec 2018 to Jan 2020.

Inclusion Criteria

Pregnant women in spontaneous onset or induced labour

- In first stage of labour with cervical dilatation of more than or equal to 4cms
- Singleton pregnancy
- >36 weeks gestation
- Cephalic presentation

Exclusion Criteria

- Antepartum haemorrhage
- Breech presentation
- Multiple pregnancy
- Premature labour <36 weeks
- Patients unwilling

After confirming that the patients fulfill the above criteria and evidence of labor confirmed, the detailed history, general physical examination and systemic examination was done including abdominal, per speculum and per vaginal examination. All examinations to determine the cervical dilatation and fetal station were carried out during a contraction. Since the true estimate of cervical dilatation is difficult to achieve with a flaccid cervix, it is probably best to measure dilatation during a height of uterine contraction at all times. Examinations were carried out four hourly throughout the duration of labor. However, modifications were made to account the rapidly progressing labor, especially during the maximum slope of dilatation, wherein, examinations were done much more frequently. All the relevant findings were charted serially on a partogram and a continuous partogram was obtained.

The partogram used in this study is the WHO partogram which is similar to Philpott and Castle original description.

When the partogram continued to be normal, no intervention was done. When the partogram suggested that the progress was slow, Amniotomy was performed.

If the dilatation curve crosses the alert line, the patient was immediately reassessed. At the time of reassessment, a high index of suspicion for cephalopelvic disproportion was maintained. If significant cephalopelvic disproportion was found during the reassessment the labor was terminated with cesarean section.

The most important factor found to exist in the cases where arrest was, cephalopelvic disproportion. The pattern of the descent curve was then strictly monitored. However, if there was no descent for at least one hour, arrest of descent was diagnosed. In the absence of cephalopelvic disproportion, oxytocin drip was started to obtain ideal contractions and further progress watched. In cases of fetal distress in labor was diagnosed, immediately it was terminated by operative intervention.

The graphs of the patient were analyzed and were placed in one of the three categories:

1. Group A – patients who delivered before the partogram touched the alert line.
2. Group B – patients who delivered when the partogram lies between the alert and the action line.
3. Group C – patients who delivered after the action line was crossed.

After delivery maternal and fetal condition was documented. Neonatal outcome by Apgar score at 1 and 5min and NICU admission was noted. Record of treatment given to the mother and baby was maintained.

Results

Table 1: Distribution of Age According to Gravida

Age (YRS)	Primi Gravida		Multi Gravida	
	N	%	N	%
18-20	40	40.0%	2	2.0%
21-25	46	46.0%	61	61.0%
26-30	10	10.0%	30	30.0%
31-35	3	3.0%	6	6.0%
36-40	1	1.0%	1	1.0%
Total	100	100.0%	100	100.0%

The age group in the present study was between 18-40years. Mean age in primigravida was 22.5years, 25.4years in multi. Maximum patients were distributed in the age group 21-25years with 53.5% and 21% in 18-20years age group. Minimum age was 18yrs and maximum 40yrs.

Table 2: Spontaneous/Induced Labor According to Gravida

Spontaneous/Indu Ced Labor	Primi Gravida		Multi Gravida	
	N	%	N	%
Induced	14	14.0%	5	9.5%
Spontaneous	86	86.0%	95	90. 5%
Total	100	100.0%	100	100.0%

Significant difference is present between spontaneous labor which is 90.5% compared to induced labor which is 9.5%.

Table 3: Mode of Delivery According to Gravida

Mode Of Delivery	Primi Gravida		Multi Gravida		p value
	N	%	N	%	
FORCEPS	6	6.0%	2	2.0%	0.094
LSCS	8	8.0%	3	3.0%	
VACCUM	5	5.0%	2	2.0%	
FTND	81	81.0%	93	93.0%	
Total	100	100.0%	100	100.0%	

Statistically significant difference is not observed in between primigravida and multigravida according to the mode of delivery. But significant difference is seen between FTND which is 87% and operative interference such as forceps 4%, vacuum 3.5% and LSCS 5.5%.

Table 4: Mode of Delivery According to Cervical Dilatation Among Primi Gravida Cases

Mode of Delivery	Cervical dilatation on admission		Total
	4 – 5 cms	> 5 cms	
FTND	77	6	83
Forceps	5	-	5
Vacuum	4	-	4
LSCS	8	-	8
Total	94	6	100(100%)

In table 4, it is observed that 94% primis came with cervical dilatation of 4-5cm of which 77% had FTND, 5% forceps, 4%vaccum and 8% LSCS. All those who came after 5cm dilatation had FTND.

Table 5: Mode of Delivery According To Cervical Dilatation Among Multi Gravida Cases

Mode of delivery	Cervical dilatation on admission		Total
	4 – 5 cms	> 5 cms	
FTND	71	21	92
Forceps	2	-	2
Vacuum	2	1	3
LSCS	3	-	3
Total	78	22	100(100%)

In table 5, it is observed that 78% multis came with cervical dilatation of 4-5cm of which 71% had FTND, 2% forceps,2% vaccum and 3% LSCS. 22% patients came with >5cm dilatation of which 21% had FTND and 1% vaccum.

Table 6: Distribution of Groups According to Gravida

Groups	Primi Gravida		Multi GRAVIDA		p value
	N	%	N	%	
A	77	77.0%	86	86.0%	0.145
B	14	14.0%	11	11.0%	
C	9	9.0%	3	3.0%	
TOTAL	100	100.0%	100	100.0%	

It is observed that there is no statistically significant difference between the primigravida and multigravida according to the partogram group. But significant difference exists in between the group A with 81.5%, group B with 12.5% and group C with 6% distribution.

Table 7: Distribution of Mode of Delivery According To Groups Among Primi Gravida Cases

Mode Of Delivery	Group						p value
	A		B		C		
	N	%	N	%	N	%	
Forceps	0	0.0%	2	18.2%	0	0.0%	<0.001 *
Lscs	0	0.0%	0	0.0%	3	100.0%	
Vaccum	0	0.0%	2	18.2%	0	0.0%	
Ftnd	86	100.0%	7	63.6%	0	0.0%	
Total	86	100.0%	11	100.0%	3	100.0%	

There is significant statistical difference between the outcomes of labor in relation to the partogram group in the primigravida. It is observed that 100% of the primigravidae in group A and 63.6% in group B had FTND wheareas 100% of them in group C underwent LSCS

Table 8: Distribution of Mode of Delivery According to Groups Among Multi Gravida Cases

Mode of Delivery	Group						p value
	A		B		C		
	N	%	N	%	N	%	
Forceps	1	1.3%	3	21.4%	2	22.2%	<0.001 *
Lscs	0	0.0%	1	7.1%	7	77.8%	
Vaccum	1	1.3%	4	28.6%	0	0.0%	
Ftnd	75	97.4%	6	42.9%	0	0.0%	
Total	77	100.0%	14	100.0%	9	100.0%	

There is significant statistical difference between the outcomes of labor in relation to the partogram group in the multigravida. It is observed that 97.4% of the multigravidae in group A had FTND whereas 22.2% and 77.8% of them in group C underwent forceps delivery and LSCS respectively

Table 9: Duration of First Stage of Labor According to Gravida

Time in hours	Primi Gravida		Multi Gravida		p value
	N	%	N	%	
0 – 4 hrs	9	9.6%	47	47.5%	<0.001*
4 – 8 hrs	81	86.2%	49	49.5%	
> 8 hrs	4	4.3%	3	3.0%	
Total	94	100.0%	99	100.0%	

Statistically significant difference exists between primigravida and multigravida in relation to the duration of first stage of labor especially in the 0-4 hrs and 4-8 hrs group. Mean duration of first stage of labor, starting from 4cm cervical dilatation in this study is 5 hrs 10 mins in primi and 4 hrs 20 mins in multi

Table 10: Duration of Second Stage of Labor According to Gravida

Time in minutes	Primi Gravida		Multi Gravida		p value
	N	%	N	%	
< 30 mins	41	43.6%	79	79.8%	<0.001*
30 – 60 mins	51	54.3%	20	20.2%	
> 60 mins	2	2.1%	0	0.0%	
Total	94	100.0%	99	100.0%	

Statistically significant difference exists between primigravida and multigravida in relation to the duration of second stage of labor especially in the 30-60 and <30 mins group. Mean duration of second stage of labor is 30.8 mins in primi and 20.7 mins in multi with standard deviation of 14.7 in primi and 9.8 in multi.

Table 11: Maternal Complications According to Gravida

Maternal Complications	Primi Gravida		Multi Gravida		P Value
	N	%	N	%	
Gdm	0	0.0%	1	1.0%	0.199
Hdp	0	0.0%	1	1.0%	
Oligohydromnios	0	0.0%	1	1.0%	
Pph	3	3.0%	0	0.0%	

From the above table 11, it is observed that there is no significant statistical difference in between the primigravida and multigravida in relation to the maternal complications. Maximum number of patients i.e. 97% had no complications.

Table 12: Neonatal Complications According To Gravida

Neonatal Complications	Primi Gravida		Multi Gravida		P Value
	N	%	N	%	
Birth Asphyxia	8	8.0%	2	2.0%	0.064
Meconium Aspiration	1	1.0%	5	5.0%	
Shoulder Dystocia	0	0.0%	1	1.0%	

From the above table 12, it is observed that there is no significant statistical difference in between the primigravida and multigravida in relation to the neonatal complications. Maximum number of patients i.e. 91.5% had no complications. Only 3% had meconium staining who needed stomach wash after delivery, 5% had birth asphyxia, 0.5% had shoulder dystocia.

Discussion

The age group in the present study was between 18 – 40 years with mean age of 22.5 yrs among primi gravida and 25.4yrs among multigravida. Among them booked cases were 72.5% and unbooked cases 27.5% in total. Among the type of labor, spontaneous labor was 90.5% compared to induced labor which was 9.5% in total.

It is observed that the present study correlates with Philpott & Castle[5] series and Daftary &Mhatre [6, 7] series done among primigravidas with 81% FTND, 6% Forceps application, 5% Vacuum delivery and 8% LSCS. Among the multigravidas, in this study, 93% had FTND, 2% Forceps application, 2% Vacuum delivery and 3% LSCS.

Table 12: Outcome of Labor In Comparison With Other Studies

Outcome of labor			
Outcome of labor	**Philpott & Castle series**	**Daftary & Mhatre series**	**Present study (primi)**
FTND	78.85%	68%	81%
Forceps	15.55%	14%	6%
Vacuum	-	-	5%
LSCS	2.6%	7.5%	5.4%

In the present study all the patients on admission had cervical dilatation in between 4-7 cms. Compared to the Paul Holmes[8] study, in the present study there were 74% of FTND with 4-5 cms and 13.5% with > 5 cms, 6.5% of Forceps / Vacuum application with 4-5 cms and 0. 5% with >5cms , LSCS for 5.5% with 4-5 cms and none with >5cm . Present study correlates partly with Paul Holmes study.

It is observed that the present study correlates with P.J Steer[9] study with first stage average duration of 5 hrs 10 mins and second stage average duration of 30.8 mins in primi.

Table 13: Duration of Labor In Comparison With P.J Steer *et al*. [9] Study

Duration of labor	P.J Steer *et al* [9]	Present study
		Primi
First stage in hrs	5.4	5 hrs 10mins
Second stage in mins	46	30.8 mins

The present study correlates with Shinde *et al* study with 81. 5% of patients in group A, 12. 5% in group B and 6% in group C. Improvement in Group C is seen in this study mainly because of active intervention once the partograph crosses the alert line.

It is observed that maintaining a partogram during labour and following its progress, it is possible to predict with reasonable accuracy the likely outcome of the labour.

Thus a patient in group A had a good prognosis for vaginal delivery. All the patients in group B required intensive monitoring with active management of labour. Even group B patients had a high percentage of vaginal delivery and there were no LSCS. Patients belonging to the group C should be categorized as 'at risk' and aggressive intervention is called for.

It is observed that the present study correlated to some extent to the Behera RB *et al* [10] study. Compared to the primigravida, multigravidas neonate had minimal complications in the peripartum period. There were no neonatal deaths in both the studies.

Maternal complications among the primigravida and multigravidas were also minimal and this can be attributed to the effective use of the partogram during the labour. Most common maternal complication was post partum hemorrhage seen in 3 primigravidas.

Conclusion

Although labor is a natural phenomenon leading to the child birth and most of them do occur spontaneously, a few tend to become dystocic and result in prolonged labor. Hence it is essential to identify the abnormality early and deliver them safely in time by active management of labor.

From this study and previous studies, it is evident that the routine use of the partogram is beneficial to detect abnormalities in the progress of the labor and it permits early corrective therapy.

With the constant evolution of partogram through time from Friedman's curve to presently used e partograph and paperless partogram devised by Dr. A.K Debdas, using the partogram has helped in achieving the policy of active management of labor proving to be ideal method of monitoring labor progress.

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