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Utility of Alert and Action Lines on Partograms in Management of Labour in Primigravida for Improving Prenatal Outcome

KEYWORDS: Partogram; Alert Line; Action Line; Prolonged Labour, Labour dystocia, Maternal and Fetal outcome, Arrest of labour; Augmentation of Labour.

Dr. Ajay Kumar Sharma
(Assistant Professor),Department of Obstetrics and Gynecology J.L.N. Medical College, Ajmer

Dr. Kanti Yadav
(Professor & Head),Department of Obstetrics and Gynecology J.L.N. Medical College, Ajmer

Dr. Suchitra Narayan
(Assistant Professor),Medical College, Ajmer, Department of Obstetrics and Gynecology Lady Hardinge Medical College Delhi

Dr Jaiprakash Narayan
(Assistant Professor),Department of pediatrics J.L.N. Medical College, Ajmer

ABSTRACT *Background and objectives : Labour is a simple natural process; which can take a turn producing it 'lethal' and most dangerous for any patient. Partograph serves as a simple and inexpensive tool to monitor labour and provide early recognition of any deviation from normal progress of labour. The objective of this study is to recognize at an early stage, the abnormal labour and to assess management option for different abnormal labours detected to reduce perinatal morbidity and to study utility of alert and action lines.*

Methodology : In this prospective cohort study conducted in Department of Obstetricts and Gynecology, J.L.N. Medical College, Ajmer. 250 patients within a span of 6 months (January 2012 to July 2012) were studied. Term primigravidae patients were choosen with cephalic presentation and vertex as the presenting part were choosen and with no obstetrics and medical complications.Results and Summary : This was a prospective study of 250 patients where all patients were primigravide with progress of labour depicted on WHO Partogram. The study divides patients into 3 groups and the partogram into 3 zones. Group A : Safe zone - Patients who deliver before the alert line reached. Group B : Observation Zone - Patients who deliver after alert but before the action line. Group C : Intervention zone - Patients who deliver after action line has crossed. In the present study, the mean age of the patients was 21.4 years. Mean rate of cervical dilatation was 1.78 cm/hr. Most of cases went into spontaneous onset of labour. Maximum numbers of deliveries were FTND; LSCS rate was 6%. Patient crossing the Alert line had longer duration of labour and required augmentation. Perinatal mortality was 0.8%. Mean total duration of labour was 3.9+1.5 hrs. Patients with a favourable partogram i.e., patients in Group A had high FTND rate, Group B required intervention, Group C were at risk & had LSCS. Majority of babies delivered were at term; had APGAR at 1 min in between 7-8 and 94% had no complications. Conclusion : Labour is a natural phenomenon; few tends to become dystocic and go in for prolonged labour. From this study, it's evident that routine use of partogram is helpful to detect abnormalities in the progress of labour and it permits early corrective therapy. Partogram management with 3 zones increase quality & regularity of observation and act of early warning systems for detection of abnormal progress; enabling early decision for referral; intervention; or termination of that labour, thus improving maternal & fotal outcome and so should be routinely used.

INTRODUCTION :-

Labour represents the high point of pregnancy, where most mothers approach with mixture of emotions, apprehension & if it's unduly prolonged; it give rise to 3 distress : fetal, maternal and obstetricians distress! A women's life time risk of maternal death is 1 in 75 in developing countries and about one quarter babies die during birth. Prolonged & obstructed labour are one of the known avoidable causes for maternal & perintatal morbidity & mortality. About 42000 death or 8% of all maternal deaths in 2010 were estimated to be due to obstructed labour and can result in fetal hypoxia and perinatal morbidity.

A Partograph is a complete graphical record, used for early detection of abnormal progress of labour and prevention of prolonged labour, serves as an early warning system & assist in early decision of Referral, Augmentation and Termination of Labour to reduce risk of PPH; Sepsis, Obstructed labour & uterine rupture. In this study; we will try to prospectively evaluate the use of simplified WHO Partogram in progress of labour in Primigravide.

METHOD :-

This study involved a detailed prospective cohort study of 250 patients admitted at Rajkiya Mahila Chikitsalaya, Ajmer within a span of 6 months (January 2012 - July 2012).

Term primigravidae patients were choosen for study with cephalic presentation & vertex as the presenting part.

Exclusion criteria - Patients with high risk & any medical complication.

Detailed history taking; general and systemic & obstetric examination were done. Abdominal examination with all grips for presentation & descent along with detailed pelvic examination for (cervical dilation, effacement; position) membranes; contractions; station of head and pelvic assessment.

Various aspects of labour with progress of labour were studied and examined 4 hourly. All the relevant findings were charted serially on a Partogram. The onset of recording i.e. Zero hour was taken to be the admission time

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of patient. When the active phase began; alert line was drawn at a slope of 1../hr and action line drawn four hour parallel & right of alert line.

A protocol for labour management with the Partogram was devised and tested as follows –

(i) When the partogram continued to be normal - no inter vention done.
(ii) When partogram showed slow progress; amniotomy performed.
(iii) If dilatation curve crosses the alert line; the patient was immediately reassessed and high index of suspicion for a CPD mede.
(iv) If significant CPD found during reassessment, labour was terminated with LSCS.
(v) Those patient with a borderline CPD; were given trial ofvaginal delivery & their labour progress was strictly monitored and pattern of dilation curve assesed on Par togram and further progress looked after oxytocin stim ulation.

1. If slow & constant progress seen - Protracted Dilation – No intervention
2. If slow progress & cease for 2 hour – Arrest – Oxytocin stimulation
3. If delay in descent for 1 hour – Arrest - Oxytocin stimu lation
4. If fetal distress – Operative intervention

The graphs of all the patients were analysed and were placed in one of 3 categories :

1. Group A - Patients who delivered before alert line.
2. Group B - Patients who delivered when Partogram lies between Alert Action Line.
3. Group C - Patients who delivered after Action line was reached.
   After delivery, labour notes were written as follows- Mode of delivery (spontaneous/induced/ augmented),LSCS/forceps; placenta and membrane, 3rd stage complication and neonatal outcome & maternal complication.

RESULTS :-

The following results were studied :-

Most of the patients were found to be < 25 years with peak value of 20 years. Mean gestational age was 39.40 weeks.

Table 1 :
Onset of Labour

Onset of labour	No. of patients
Spontaneous	207
Induced (indications)	
Prolonged pregnancy	16
PROM	21
Prolonged latent phase	2
Severe Preeclampsia	4
Total induced labours	**43**

Of 250 patients , 207 were admitted in spontaneous labour; while in 43 patients labour was induced, due to reasons of prolonged pregnancy (6%), PROM (8%), prolonged latent phase (1%) and severe preeclampsia (2%).

Table 2 :
Comparison between spontaneous and induced labours

Parameters	Spontaneous (n=207)	Induced (n =43)	P- value
Mean age in years	21.314±2.297	21.558±1.85	0.513
Mean gestation in weeks	39.391±1.169	39.9±1.377	0.0114
Augmentation required	124	26	1.00
Duration of 1st stage in hrs	3.338±1.486	3.334±1.25	0.99
Duration of 2nd stage in min	33.64±22.2	39.4±30.184	0.09
LSCS	11	4	0.30
Forceps delivery	6	1	1.00
Birth weight	2.71±0.388	2.65±0.35	0.26
NICU admission	10	3	0.47
Patients crossing alert line	21	1	0.14

Significant difference was found only in mean gestation age among the groups.

Table 3 :
Duration of first stage of labour

Time interval	No. of patients
00.30-1.30 hrs	14
1.31- 2.30 hrs	55
2.31- 3.30 hrs	60
3.31- 4.30 hrs	36
4.31- 5.30 hrs	17
5.31- 6.30 hrs	12
6.31- 7.30 hrs	3
7.31 - 8.30 hrs	1
8.31- 9.30 hrs	1

Duration of First stage of labour (from 4 cm dilatation to full dilatation). Mean duration was found to be 3.41+1.4 hour.

Table 4 :
Duration of second stage of patients

Time interval	No. of patients
0- 20 mins	82
21- 40 mins	106
41- 60 mins	39
61- 80 mins	5
81- 100 mins	5
101- 120 mins	2
121- 140 mins	2
141- 160 mins	2
Total	**243**

Duration of 2nd stage a labour (from full dilatation to delivery of baby).

Mean duration in this study was 33.64 + 23.85 mins.

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Table 5 :
Total duration of labour

Time interval	No. of patients
1.00 – 2.30 hrs	38
2.31 – 4.00 hrs	80
4.01 – 5.30 hrs	49
5.31 – 7.00 hrs	24
7.01 – 8.30 hrs	6
8.31 – 10.00 hrs	0
10.01 – 11.30 hrs	2
Total	**199**

Total duration of labour was found to be (3.96+1.5 hr). It was calculated by adding first one second stage of labour.

Table 6 :
Need for Augmentation

Augmentation	No. of patients
No augmentation done	100 (40 %)
Augmentation done	
ARM	82
Oxytocin	29
ARM + Oxytocin	39
Total	150 (60%)

Need for augmentation was found in 150 patients while 100 patients delivered without any augmentation.

Table 7 :
Mode of Delivery

Mode of delivery	No. of patients
Normal vaginal delivery	227 (90.8%)
LSCS	15 (6%)
Forceps delivery	7 (2.8%)
Face to pubis	1 (0.4%)

Around 227 (90.8%) delivered normally and 15 (6%) had LSCS while 7 (2.8%) had forceps delivery. There was one face to pubis delivery.

Table 8 :
Neonatal outcome

Neonatal outcome	No. of babies
APGAR score < 7 at birth	15
NICU admission	
1. Meconium aspiration	8
2. Respiratory distress	4
3. Birth asphyxia	1
Total	13
Still born	1

Neonatal outcome seen in 15 babies (6%) had APGAR score <7. Out of these 13 were shifted to NICU (8 for maximum aspiration, 4 for respiratory distress, 1 for Birth Asphyxia), 1 baby died in NICU ater 4 hour and 1 still born. and so total 2 neonatal mortality (0.08%)

Table 9 :
Groupwise division patients based on alert and action line

Group		No. of patients
Group I	Left to alert line	228 (91.2%)
Group II	Between the alert and action line	20 (8%)
Group III	Right to action line	2 (0.8%)

Out of 250 patients; 22 (8.8%) crossed Alert line and 2 crossed Action line

Table 10 :
Comparison between augmentation requiring and not requiring groups

Parameters	Augmentation done (n=150)	No augmentation done (n=100)	P-value
Mean age (in years)	21.701±1.8999	21.733±2.600	0.273
Mean gestational age (in weeks)	39.745±1.175	39.089±1.184	<0.0001
Induced labour	26	17	0.308
1st stage duration in hrs	3.762±1.576	2.653±0.8448	<0.0001
2ndstage duration in mins	37.444±27.713	28.208±15.559	0.0027
Forceps delivery	6	1	0.2481
LSCS	15	0	<0.0001
NICU admission	8	5	1.0000
Crossed alert line	22	0	<0.0001

Significant difference between the group were found in mean gestational age, first stage labor duration, LSCS rates and patient crossing alert line.

Table No. 11 :
Comparision of patients remaining left to alert line with patients right to alert line

Parameters	Patients left to alert line (n=228)	Patients right to alert line (n= 22)	P- value
Mean age in years	21.338±2.104	21.727±3.312	0.4351
Gestational age in weeks	39.461±1.218	39.682±1.249	0.4175
Induced labours	42	1	0.1388
Augmented labours	128	22	<0.0001
Duration of 1st stage labour in hrs	3.085±1.138	6.433±1.208	<0.0001
Duration of 2nd stage labour in mins	32.925±22.967	43.2355±32.880	0.0856
LSCS	9	6	0.0007
Forceps	5	2	0.1185
NICU admissions	11	2	0.3198
Perinatal mortality	1	1	0.1686
Birth weight in kgs	2.754±0.3815	3.0492±0.8492	0.0017

P- value (<0.05) was found significant in augmented labor, duration of first stage, LSCS rates and birth weight between the two groups.

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Table 12 :
Indications for caesarean sections in our study

INDICATIONS	FIRST STAGE	SECOND STAGE
Arrest of dilatation	6	
Foetal distress	1	
CPD		1
Arrest of descent		3
Deep transverse arrest		3
Brow presentation		1

Out of 15; 7 were performed in 1st stage [6 for secondary arrest of cervix dilatation and 8 were performed in 2nd stage. 1 for foetal destress)

DISCUSSION :-

1. Parity affect the course of labour, multipara have speedier delivery. In the study all were nullipara.
2. Mean gestational age was 39.48 weeks and 80% delivered 2 weeks prior to EDD.
3. Onset of labour: In our study; no significant difference found between spontaneous & induced groups.
4. Duration of 1st stage of labour - The standard Alert Line defined as a rate of cervical dilatation of 1 cm/h represents mean rate of cervical dilatation of the slowest 10% of primigravida spontaneous labours. In our study cervical dilatation in lowest 10th centile was (0.99 cm/hr). There was increasing cervical dilation rate upto 7 cm; beyond which there is decrease in mean rate of dilatation therefore Deceleration phase.
5. Duration of 2nd statge of labour. Median duration is about 33.64+23.8 mins in our study.
6. Need for augmentation : ARM was used as a primary measure in cases with slow progress of labour, and oxytocin was added when the labour progress, in terms of uterine contractions and cervical dilatation remained slow; inspite of ARM. In our study 60% required active management of labour due to protocol followed in our study. There were 15 LSCS in augmentation requiring group, which means 90% of nulliparas improved with augmentation & delivering vaginally.
7. Mode of delivery : 90.8% of delivered normally, 6% had LSCS, 2.8% had forceps and one face to pubis delivery.
8. In our institute; LSCS rate around 30%; but in our study, only 6% LSCS rate which is low due to the fact that, once the patients enters active labour (>4 cm dilation), progress of labour is smooth and rapid & also with augmentation.
9. Indications for caesarean sections in our study were (out of 15, 7 were performed in 1st stage,) 6 for secondary arrest of cervical dilatation, one for foetal distress and (8 were in 2nd stage) one for CPD 3 for arrest of descent, 3 for DTA and one for brow presentation

9.Neonatal outcome : There were 2 perinatal mortality (0.08%) which was associated with labour dystocia (one due to DTA, other due to fetal asphyxia in secondary arrest of cervical dilation)

1. Alert line and action line : A comparison between nullipara, who remained left to alert lines and who crossed it was done. Duration of labour, will be longer in patients crossing Alert Line and required labour augmentation.

CONCLUSION :-

From this study it's evident that routine use of the partogram is helpful to detect abnormalities in the progress of labour and it permits early corrective therapy. Management of patient with Partogam with 3 zones increase quality and regularity of observation and act as ''Early Warning System" for detection of abnormal progress, enabling early referral, intervention or termination, to improve fetal maternal outcome. Partogram with 3 zones should be routinely used. It is inexpensive simple, sensitive and specific and time saving and gives clear picture & labour for evalution and diagnosis of abnormal uterine action. It is very helpful during hand over of patients during referral and can be kept as concrete base of permanent record of that particular labour, as complete data of entire course of labour recorded on a single sheet of paper.

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