



RESEARCH ARTICLE

VALIDITY OF PAPERLESS PARTOGRAM – A NEW SIMPLE CLINICAL TOOL FOR PREVENTION OF PROLONGED AND OBSTRUCTED LABOR

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ARTICLE INFO

Article History:

Received 23rd September, 2016
Received in revised form
28th October, 2016
Accepted 20th November, 2016
Published online 30th December, 2016

Key words:

Paperless Partogram,
Management of labour,
ETD,
Prolonged labour,
Obstructed Labour.

ABSTRACT

Paperless partogram is a simple clinical tool, which in a gravid women in active phase of labour, can predict the expected 'time' of delivery (ETD) of the baby and also programmes management of labour. This tool was developed by Dr A K Debdas 2006 (India) and is widely quoted in the net.

Objective: The objective of this study was to check the validity & effectiveness of Paperless partogram.

Materials: A total 436 women of normal singleton pregnancy in "natural spontaneous labour" at 37 weeks to 42 weeks of gestation, were included for the study in prospective manner from the labour unit of VSS Institute of Medical science, Sambalpur, Odisha. During November 2013 to August 2015. The proportion of Primi to Multi was 66.98% : 33.56%. **Method:** At the very first PV examination in "active phase" of labour ETD was calculated by application of Friedman formula of dilatation of cervix in labour of *1cm/hour* and recorded in BOLD letter, The whole procedure is "paperless" and is a split-second 'mental' calculation.

Result: On matching the 'actual time of delivery' with the calculated ETD, it was found that 70.8% of primi & 88.8% of multi delivered before the predicted ETD. Those who (both primi & multi) failed to deliver by their predicted delivery time – they all however delivered by the 4 hours action time point.

Conclusion: Paperless Partogram is a highly reliable, simple clinical tool, which effectively manages labour, prevents prolonged & obstructed labour. So Paperless partogram may serve as a valid alternative to the conventional WHO Partogram which is very complex & time consuming.

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Citation: Dr. Prakash Chandra Mishra and Dr. Lalmohan Nayak, 2016. "Validity of paperless Partogram – A new simple clinical tool for prevention of prolonged and obstructed labor", *International Journal of Current Research*, 8, (12), 43887-43890.

INTRODUCTION

We all know and accept that pregnancy is a biological programme of roughly 280days and accordingly allot an expected 'Date' of delivery (EDD) for all the antenatal cases, as calculated by Naegle's rule but, surprisingly, so far, a similar time end point — the expected 'Time' of delivery (ETD) for the biological programme of the labor process has not been pronounced, though the requirement of such a 'time target', is the need of hour. ETD is only a low skill mental tool which, in a laboring patient, predicts her approximate spontaneous 'delivery time' instantly. This constitutes the main software on which 'Paperless Partogram' is based. This simple and user friendly clinical tool was developed by Dr A K Debdas 2006 (India) and is widely quoted in the net. It takes only 20 seconds, requires only basic addition and the reading of a clock or watch, and holds potential for more effectively mobilizing clinicians to prevent prolonged labor & its disastrous outcome. Review of literature shows that such a time end-point -the

expected 'time' of delivery can be derived by application of Friedman's rule of labor when applied in the 'active phase' of labor with cervix at least 4 cm dilated which, in fact, is the basis of the conventional WHO partogram. But what may be the reason for non-use of the conventional WHO partogram ?? These were generated from the questionnaires as, (1) The system is unduly elaborate, (2) Extra-time is required to plot the data – staff have no time, (3) Inhibitory feeling because of the "complex face" of the partograph paper, (4) Reluctance about plotting data on graph paper- would rather write in long hand, (5) Unavailability of partograph chart paper, (6) In addition to this, there are large number of labouring women in low resource settings with shortage of trained hands appears as a major drawback of partograph. So a simple easily comprehensible and user friendly labor monitoring system like ETD is the need of hour.

Aims and Objective

Testing the validity of Friedman's formula in Indian context through application of a simple tool called ETD (Expected 'time' of delivery). The purpose of this research is to find the

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'validity of ETD' as derived by Friedman's rule in the Indian context since this formula was developed through research in a different continent # on a different race and # 60 long years back. In other words, this study proposes to test how far the Friedman's formula is applicable on Indian mothers and racial variation in cervimetric progress of labour has been reported.

Place of study

Department of Obstetrics and Gynaecology in VSS Medical College, Burla, Sambalpur, Odisha.

Study Period:- November 2013 to October 2015.

Type of study:- Prospective Observational study.

Materials

Inclusion criteria:

- Any gravid women, irrespective of age and parity, in established labour (i.e. is contracting at least 1 in 10 minutes or more frequently) with cephalic presentation, irrespective of whether the membranes are intact or ruptured.
- The onset of labor has to be spontaneous (not induced).
- The patient must be at least 4 cm or more dilated at the point of inclusion.
- Gestational maturity should be 37 completed weeks to 42 weeks.

Exclusion criteria

Induced labour, previous caesarean, twins, severe PIH, APH or presence of any severe complication, patient getting Epidural Analgesia.

Methods

The method entails spending of - only five minutes per case as explained below.

- There are an ALERT ETD & an ACTION ETD.
- The *ALERT* calculation uses Friedman's widely accepted rule that cervix dilates 1cm/hr, at the very first PV examination while a woman is in active labour (i.e. when cervix is dilated to 4 cm or more), e.g. if in a case the cervix is 4cm dilated at 2pm, her ETD would work out as 2pm + 6 hours = 8 Pm, assuming that she would take 6hrs to dilate the remaining 6cm to become 10cm.
- The clinician adds 4hrs to *ALERT ETD* to get the

Action ETD

- Both the ETDs should be written in big BOLD letter in front page of the woman's case sheet.
- The ACTION ETD is to be circled in red.
- The whole procedure is "paperless/graphless" and is a split-second 'mental' calculation.

Plan worked out for labour management based on these two ETDs

- It is very simple :

- Alert ETD advises – *Get alerted* (e.g. inform senior or in rural situation transfer her to higher centre where c-section facilities are not available) if the mother has not delivered by this statistically predicted probable time. A mandatory PV to be done at this time point.
- Action ETD advises – *Get active* (seriously consider providing assistance – may be augmentation or operative delivery-vaginal or abdominal as would be found suitable) if she has not delivered spontaneously even by this extra 4 hours time. Another mandatory PV to be done at this time point.
- Throughout the process of active labour the ETD also helps prevent prolonged labour by prompting clinicians to work towards a roughly "on time" delivery i.e. by the predicted ALERT ETD. For example, if uterine contractions are poor close to the ALERT ETD, clinicians can give the woman oxytocin or an equivalent to strengthen contractions for augmentation of labour.
- Of course, if a woman faces any obstetric complications before any ETD, clinicians should pursue necessary interventions to keep her and her child healthy regardless of ETD.

Monitoring the labour progress

Monitoring of the labour progress was done as below;

1. ½ hrly FHR, Liquor, No. of Contractions in 10 mins (The ideal no. of contractions is 3 in 10 mins, If less than this one may decide to augment by oxytocin drip) & Pulse.
2. Hourly, BP & temperature.
3. Vaginal examination is done at 3 hourly interval (earlier if indicated) for assessment of
 - Dilatation of cervix in cm
 - Decent of presenting part in cm/ caput or moulding.

The above findings in "Paperless Partogram" can simply be written in the women's case sheet directly, instantly, (graphlessly/paperlessly) as mentioned below & can be interpreted very easily

Pulse, BP –P/A – Uterus – contraction – 3/10/25
- relaxation – Good, FHR –PVexam. – Cervix -
effacement, dilatation, Vx station, moulding, Meconium.

Observations

Analysis of Data & Results

Table I. Age breakup of the cases

Age	No. of cases
Up to 19 years	35(8.03%)
20-30 years	353(80.96%)
> 30 years	48(11.01%)
Total	436

Majority (81%) of cases in the study were belong to age group of 20–30 years.

The proportion of primi (66.98%) and multi (32.56%) in this study was 2:1. Majority of the multigravida were belong to Para 1-4.

Table II. Parity breakup of the cases

Parity	No of cases
Primi para	292(66.98%)
Para 1-4	142(32.56%)
Para 5 or more	2(0.46%)
Total	436

Table III. Distribution of cases According to gestational age

Gestational Age	Primigravida	Multigravida
<37 wks	0	0
37 – 40 wks	268(91.78%)	135(93.75%)
41 – 42 wks	24(8.22%)	9(6.25%)
	292(100%)	144(100%)

Table IV. Overall tally of the predicted ETD

Predicted ETD	Primigravida	Multigravida
Delivered within the predicted ETD time	207(70.8%)	128(88.8%)
Delivered after the predicted ETD time	85(29.2%)	16(11.2%)
Total	292(100%)	144(100%)

Table V. Mode of Delivery

Mode of delivery	No of Cases
Normal delivery	394 (90.37%)
Ventouse (incomplete rotation & poor uterine contraction not corrected by oxytocics)	12 (2.75%)
Forceps (Fetal Distress)	14 (3.21%)
LSCS (DTA, Occipito-Posterior position, Acute Fetal-Distress, Failed instrumental delivery / Augmentation of labour)	16 (3.67%)

Majority of the cases in this study were belong to 37 – 40 weeks of gestational age as 92% in primigravida and 94% in multigravida respectively.

Table VI. Analysis of cases delivered within the predicted ETD

How long before	Primipara (N-207)	Multipara (N-128)
More than 3 hours before	117 (56.52%)	80 (62.50 %)
Between 2-3 hours	44 (21.25%)	30 (23.43%)
Within 2 hours before	46(22.23%)	18(14.07%)

Table VII. Birth weight distribution

Birth weight	No of cases	%
< 2 kg	21	4.81%
2001gm – 2.5 kg	95	21.81%
2.6 – 3.0 kg.	253	58%
3.1 - 3.5 kg	64	14.68%
3.6 kg and above	3	0.70%
Total	436	100%

As can be seen from table VII, 21.81% babies weighed between 2001-2500gm because probably due to the low-socioeconomic class of the mothers. 14.68% babies weighed between 3.1-3.5 kg.

Lowest birth weight of the series was 1.6 kg. Highest birth weight of the series was 3.9 kg.

Table VIII. APGAR distribution of the cases

Apgar score	No of cases
7 – 10	425 (97.48%)
4 – 6	5 (1.14%)
3 or less	6 (1.38%)

Apgar distribution of the babies shows, 97.48 % of the babies delivered have a APGAR score of 7-10 which denotes satisfactory fetal condition and use of ETD does not increase fetal distress.

Table IX. Distribution of cases according to Augmentation of labour

Requirement of oxytocin for Augmentation	No of Cases
Required	93 (21.4%)
Did not require	343 (78.6%)
Total	436(100%)

Table X. Analysis of the cases those exceeded the predicted ETD

	Primigravida	Multigravida
Exceeded within 1 hour	46(54.12%)	10(62.5%)
Exceeded between 1-2 hours	17(20%)	3(18.75%)
Exceeded between 2-3 hours	11(13%)	1(6.25%)
Exceeded between 3-4 hours	5(5.88%)	1(6.25%)
Exceeded by > than 4 hours	6(7%)	1(6.25%)
Total	85(100%)	16(100%)

Only 6 cases (7%) among the 85 cases of primigravida & only 1 case (6.25%) among 16 cases of multigravida crossed the four (4) hour mark – the cut of point for the ‘action line’ (Philpott & Castle, 1972 a,b). In fact, it constitutes mere 1.61% of the total cases (436) only.

Table XI. Is the paperless partogram is more convenient, equally convenient or less convenient to use than WHO partogram ? This question was asked to PG trainees who were actually implementing it in labour wards

	More convenient	Equally convenient	Less convenient
PG trainees	28 (100%)	0	0

As you can see Table-XI shows that paperless partogram is more convenient as 100% of PGs are opting for this.

DISCUSSION

In the last few decades there occurred a substantial change in the management of labour. Present day obstetrics does not allow any harm to the mother or foetus during labour & child birth. So meticulous, easy & user friendly labor monitoring system from which the maternal and foetal prognosis can be known at a glance is the need of hour. The present study has been taken up with two research questions. One- is the concept of ETD (‘Paperless partogram’) as efficacious as the WHO partogram for assessment of labour? Two- is it more convenient to use? The present study, very strongly proves that ETD (which is based on the Friedman’s formula) is a very valid tool for management of labour as 70.8 % cases of primigravida & 88.8% cases of multigravida delivered before the predicted ETD. Thus it was interesting to note that all the findings presented above tallies with that of Philpott (1972), which go to certify that ETD exactly tallies with the ‘Alert line’ of partogram and adding 4 hours to ETD would give the ‘Action line’, and this is what has been proposed by Debdas (2006) and is used for his ‘Paperless partogram. Moreover, it

- is more convenient to use for monitoring labour effectively than of WHO partogram (as you can see from Table No XI).

- prevents happening of prolonged and obstructed labour.
- It ensures ‘Transparency’ of labour management- as everybody knows approximately by What time she is expected to deliver.
- It removes FEAR from the mind of the labouring women about the duration of labour from which every primis are having anxiety about uncertainty.
- As mandatory vaginal re-assessment of the cases are done at the Alert ETD time point and Action ETD time point - hence there is no chance of any neglect.
- For rural birth centres e;g in PHCs, it ensures ‘timely transfer’ of slow cases from remote centre to higher centre.

Summary and Conclusion

It is estimated that 97% of the reported stillbirths and 98% of the reported neonatal deaths occur in less developed/developing countries. In these countries, women face a 1-in-22 chance of dying during childbirth, whereas, the corresponding risk in industrialized countries is one in 8000. Continuous monitoring of labor and provision of rapid care to deal with problems are the need of hour for preventing adverse obstetric outcomes related to childbirth. Thus paperless partogram (ETD) being simple & user friendly promises to be of immense help in managing labour with timely intervention ensuring better management. It would be useful in rural India, when in a P.H.C. or Dispensary the treating Physician or a midwife can very easily know when to refer the case to a referral hospital before any maternal or fetal jeopardy occurs. It is time saving, & can be implemented for the sake of labour management efficiently because one can at-a-glance have an appreciation of the progress of labour last but not the least helps in preventing prolonged labour. So the paperless partogram helps in the detection of abnormality during dynamic process of labour early conveniently for timely management in the absence of sophisticated equipment. Thus the use of paperless partogram is a simple, safe, inexpensive, easy to learn, implement and highly effective means of monitoring progress of labour. So to conclude, the formula of cervimetric progress of ‘Active phase’ of labor as discovered by Friedman (1954), further re-confirmed by Philpott and Castle (1972) is perhaps the most striking discovery about labour and must be used to manage every labour. But the way it has been directed to use; the findings are to be put in a graph paper by laborious way on the particular designated grid - taking care of the ‘time grid’ – so that it is plotted appropriate for the time of observation. Curves or lines are to be made for interpretation. And then at the end look at these graphs seriously with analytical eye...to finally interpret, conclude and plan action is counterproductive. The complexity and the fear about filling this chart has effected in almost total non-use of this EXCELLENT LIFE SAVING TOOL specially in poor resource countries and areas. This partographic formula can be used in its totality much simply, easily and almost timelessly by the new simple & user friendly concept called “ETD” or “Paperless Partogram”.

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