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User assessment of paperless partograph

Abstract

Background: WHO partograph had drawbacks due to need of partograph besides training for it's use. Dr. Debdas proposed the Paperless Partograph designed for use by clinicians in low resource areas as a simple, non-time consuming, two step calculation requiring only basic addition and the reading of a clock/ watch, identifying slow progress of labour, the time to intervene and terminate labour or to transfer a woman to higher centres with facilities for Caesarean section. Objective of the study was to study the user assessment of the paperless partograph.

Materials and method: 25 Resident doctors were asked to use both Paperless partograph and WHO partograph on 10 patients each and then fill a user assessment tool form.Data was then analysed.

Results: Paperless Partograph had great potential to prevent prolonged labour and adverse maternal and foetal outcomes and was more acceptable because it was more user friendly, feasible,preferred and thus overall more useful.

Conclusion: Paperless Partograph was easier and user friendly yet as effective and thus, can be used instead of WHO partograph.

Keywords: Paperless partograph, User friendliness, Modified WHO partograph,monitoring

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Introduction

Around 86% of the maternal deaths occur in African and Southern Asian regions.[1] Majority of the deaths take place in lower- and middle-income countries. India has shown a significant decline in the Maternal Mortality Ratio from 130 in 2014-2016 to 88 per lakh live births in 2020-2022.[2]

Obstructed labor accounted for 2.8 percent of all maternal deaths globally.[3] Monitoring of women closely in labour has helped reduce these adverse outcomes.

Implementation of a partograph improves the efficiency and effectiveness of maternity services. It can only be used where women present to health facility in labour and where staff fulfil certain minimum training criteria.[4] The Modified WHO partograph was recommended as a part of Safe Motherhood initiative.[4]

Though improved maternal outcomes from correct partograph use are reported, several factors have been implicated in underuse and incorrect use of the partograph at all levels of maternity care like lack of awareness and proper training, low availability of partographs, negative perceptions of the partograph, high patient load, iadequate staff at the facilities, lack of supervision, and negative attitudes among some of the health workers.[5]

In resource-poor countries, problems of paucity of skilled labor, increased delivery load leads to challenges faced by treating obstetrician. Thus, it became important to devise a method that would help organize the minimal workforce in a busy labor room. Dr. Debdas proposed the use of Paperless Partograph as a simple , two step calculation requiring only basic addition and use of a watch to monitor labour progress.[6] This method could be implemented at the Primary Health Centres/Community Health Centres (PHC/CHC) without any additional cost.[7]

The use of Paperless partograph was never adopted in our hospital setting, hence this study was undertaken to study the user assessment of paperless partograph and modified WHO partograph in terms of user friendliness, preference and overall usefulness.

Material and method

It was a hospital based prospective analytical study done over a period of one year in a tertiary care centre. Women with singleton, live, term uncomplicated pregnancy with vertex presentation,in spontaneous labour having cervical dilatation of four cm or more was selected, Women with previous caesarean section, any medical disorder or any congenital anomaly or foetal distress at the start of study were excluded from the study.

Sample size: Sample size of 25 doctors assessing 10 patients by both partograph was required for user assessment, at 80% study Power and alpha error of 0.05 calculated using study of Deka G et al.[8]

Detailed history was taken and examination was done of each woman and labour monitored. WHO partograph was used as usually done,Using paperless Partograph ,the labour was monitored using Alert ETD (Estimated Time of Delivery) and Action ETD, using Friedman's curve.[9] ALERT ETD was calculated by adding the remaining dilatation to first PV finding and action ETD was calculated by adding four hrs to ALERT ETD. Both ETDs were written in big bold letters on front page of women's case sheet and ACTION ETD was encircled in red.

25 Resident doctors were asked to use both partographs on 10 patients each and to then fill a user assessment tool. This was pre validated by three consultants assigned by Head of Department. The User Assessment tool assessed both the partographs on the basis of – User Friendliness, Feasibility, Preference and Overall use,having sub questions which were scored independently and then total score calculated for each graph.

All data collected was entered in a pre- designed proforma and analysed. P value < 0.05 was taken as significant. Medcalc 16.4 version software was used for all statistical calculations.

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Results

The user friendliness of both Paperless and Modified WHO partograph was compared in terms of level of understanding, difficulty level in use and time taken to plot data (in minutes) and each factor was scored 1-5 according to difficulty level and time taken by using both on 10 women. The mean ± SD user friendliness score for Paperless partograph was 3.56 ± 12.70 and for WHO partograph was 6.80 ±18.04, indicating that the Paperless partograph with a lower score was perceived as slightly more user friendly compared to WHO partograph.

For scoring the difficulty in understanding, difficulty level of use and time taken to plot data (in minutes) there was a significant difference (p-value=0.00000066, 0.000000212 and 0.00000489 respectively) between Paperless and WHO partograph making it easier to understand, easier to use and more efficient than Modified WHO partograph (Table 1).

Table 1 Comparision of user friendliness between paperless and modified WHO Partograph

User friendliness	Paperless partograph (n=25)	Modified WHO partograph (n=25)	p-value	
1.Difficulty level in Understanding? Score				
1- No Difficulty 2- less difficulty 3- difficulty 4- Moderate difficulty 5- Not understood	19 Users – No difficulty (Score -19) 6 Users- less difficulty (Score- 12)	1 User- No difficulty (Score 1) 17 Users- Less difficult (Score-34) 7 Users- Moderate difficult (Score -21)	p-value =0.00000066 **(Significant)**	
2.Difficulty level in use? Score 1- Not difficult 2- less difficult 3- difficult 4- More difficult 5- Very difficult	20 Users- not difficult (Score- 20) 5 User- Less difficult (Score-10)	1 User- not difficult (Score- 1) 17 Users- less difficult (Score-34) 7 Users- Difficult (Score- 21)	p-value= 0.000000212 **(Significant)**	p-value= 3.76*10^{-17} **(Significant)**
3.Time taken to plot data (in minutes)- Score 1- 1 min 2- 2 min 3- 3 min 4- 4 min 5- 5 or more min	22 Users- 1 min (Score- 22) 3 Users- 2 min (Score-6)	1 User- 1 min (Score-1) 15 Users- 2min (Score-30) 9 Users- 3 min (Score- 27)	p-value =0.00000489 **(Significant)**	
Total score	**89**	**170**		
MEAN ± SD	3.56 ± 12.70	6.80 ±18.04		

Comparison of Feasibility of Paperless and WHO partograph was carried in terms of- need of graph, training level required, extra time to plot data, complexity of graph and the cost of plotting the graph. The combined feasibility was more for the Paperless partograph, there was a highly significant difference in the feasibility between the Paperless and WHO partograph, score being 16 (Paperless) v/s 144 (WHO). The Paperless partograph was more feasible than WHO partograph because there was no need of chasing the graph, no or minimal training required, minimal or less bothersome to require extra time to plot the data, less complex and no cost involved as it can be recorded on the first page of bed head ticket itself (Table 2).

In regard to preferences of residents between the two partographs, Paperless partograph was more preferred than WHO partograph. 90% residents preferred Paperless partograph. 32 % residents believed WHO partograph could also be preferred. There was a statistically significant difference (p-value= 0.00000990) in preferences between the Paperless and Modified WHO partograph, Paperless partograph being more preferred (Table 3).

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Table 2 Comparison of Feasibility of Paperless and Modified WHO Partograph

Feasiblity	**Paperless partograph (n=25)**	**Modified WHO partograph (n=25)**	**p-value**	
1.Need of Graph Score 0- Not required 1-Required	25 Users- Not required (Score-0)	25 Users- Required (Score-25)	p-value= 1.14*10^ {-11}	
2.Training level required? Score 0- Not required 1-Minimal required 2-Required	15 Users- Not required (Score-0) 10 Users-Minimal Required (Score-10)	1 User- Not required (Score-0) 11 Users- Minimal required (Score-11) 13 Users- Required (Score-26)	p-value =3.26*10^ {-6}	
3.Extra time to plot data Score 0- Minimal 1-Not bothersome 2-Bothersome	21 Users- Minimal (Score- 0) 4 Users-Not Bothersome (Score-4)	3 Users- Minimal (Score-0) 16 Users- Not bothersome (Score-16) 6 Users- Bothersome (Score-12)	p-value = 1.59*10^ {-6}	
4.Complexity of Graph Score 0- Not complex 1-Less complex 2-Complex	24 Users- Not required (Score-0) 1 User- less complex (Score-1)	20 Users- less complex (Score-20) 5 Users- Complex (Score-10)	p-value= 9.33*10^ {-11}	p-value = 7.86*10^ {10}
5.Cost of plotting the Graph Score 0- Not required 1-Yes but minimal 2-Yes and significant	24 Users- Not required (Score-0) 1 User- Yes but minimal (Score-1)	1 User- Not required (Score-0) 24 Users- Yes but Minimal (Score-24)	p-value= 4.89*10^ {-10}	**(significant)**
Total score	**16**	**144**		

Table 3 Comparison of Preference between Paperless and Modified WHO Partograph

Preferences	**Paperless partograph (n=25)**	**Modified who partograph (n=25)**	**p-value**
Score 0- Preferred 1-Not preferred	24 Users- Preferred (Score-0) 1 User- Not preferred (Score-1)	8 Users- Preferred (Score-0) 17 Users- Not preferred (Score-17)	p-value= 0.00000990 **(significant)**
TOTAL SCORE	1	17	

Paperless partograph was found to be overall more useful compared to WHO partograph. The mean score ± SD for Paperless partograph was 4.36 ± 22.52 and for Modified WHO partograph was 3.04 ± 22.82. There was a significant difference in the overall usefulness between the two partographs. The significant difference in overall usefulness can be attributed to the ability of Paperless partograph to address almost all issues of noncompliance faced while using WHO partograph even in the resource poor and high patient load settings (Table 4).

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Table 4 Comparison of overall usefulness of paperless and modified WHO partograph

Overall usefullness	Paperless partograph (n=25)	Modified who partograph (N=25)	p-value
Score			
1- Not useful at all	1 User- Good should be used (Score-3)	2 Users- Yes can be used (Score-4)	
2-Yes can be used	14 users- Should be recommended in all cases of labour (Score-56)	20 User- Good should be used (Score-60)	p-value
3-Good should be used	10 Users- Mandatory Use	3 Users- Should be used in all cases (Score-12)	=0.0001
4-Should be recommended in all cases of labour	(Score-50)		
5-Mandatory use			**(Significant)**
Total score	109	76	
MEAN ± SD	4.36 ± 22.52	3.04 ± 22.82	

Discussion

The mean user friendliness score was higher for the WHO Modified Partograph (6.80±18.04) while it was low for the paperless partograph (3.56±12.70) which differed from the study conducted by Deka G et al.[8] Thakur N et al.[10] also compared Paperless partograph to WHO Partograph which had findings similar to present study (significantly lower User friendliness score (9 ± 0.89 vs. 5.83 ± 0.75).[10] The Paperless partograph was much user friendly compared to WHO Partograph as it was easier to understand, easy to use with only simple two step calculation required and also, less time was taken to plot the data.

The combined feasibility was lower for the Paperless partograph, there was a highly significant difference in the feasibility between the Paperless and WHO partograph, score being 16 (Paperless) v/s 144 (WHO). In regard to teachability as observed by Veena L et al.,[5] the paperless Partograph (Mean Score=7.9±0.6) was rated better than the WHO Modified Partograph (Mean Score= 3.7± 1.6). Observers found it easier to train others (interns, nurses) on the utility and maintenance of Paperless partograph. The Paperless partograph was more feasible than WHO partograph because there is no need of chasing the graph, no or minimal training required, minimal or less bothersome to require extra time to plot the data, less complex and no cost involved as it can be recorded on the first page of bedhead ticket itself. Similar results were obtained in the study by Deka G et al.,[8] where most of the resident doctors (66.6%) preferred to use the paperless Partograph rather than the WHO partograph (33.4%) as it was simple graphless and less time consuming.[8] The reason for more preference of Paperless partograph was it being more user friendly and feasible. As compared to Paperless partograph, WHO partograph had significantly lower overall usefulness (7.5 ± 0.55 vs. 8.83 ± 0.41, P=0.005) as concluded in their study by Thakur N et al.[10] There was thus, a significant difference in overall usefulness of Paperless partograph.

Conclusion

Paperless Partograph thus has great potential to prevent prolonged labour and adverse maternal and foetal outcomes and is more acceptable to health care workers because of the benefits when compared to Modified WHO partograph- simple to use and understand, less time consuming, no graph to plot or chase the curve, no or minimal training, basic addition and time observation, easy to use in resource poor settings like PHCs and hospitals with high patient load, gives a right time frame to refer the patient to higher centre for timely intervention and thus reduce morbidity and mortality and more user friendly and hence, preferable. Thus, Paperless Partograph use should be encouraged as it is more user friendly.

Recommendation_

Paperless Partograph is as easier, effective and user friendly as WHO Modified Partograph. This can help in monitoring of women in labour even in resource poor settings and hence, help reduce maternal and foetal morbidity and mortality and can be used instead of WHO partograph.

Limitation of the study

1. The user assessment tool was used by 25 third year residents of Obstetrics and Gynaecology who are well versed with the plotting of the partograph during labour and thus, the results may not be reflective of the doctors posted in peripheral centres who are usually MBBS graduate. More studies would be required to assess the user friendliness of the paperless partograph on these doctors.

2. Since, the study was carried out in a tertiary centre any other limitation which could arise during the use of Paperless partograph in PHCs, CHC or sub-district hospitals could not be identified. Hence, more such studies need to be carried out in peripheral institutes.

Compliance with Ethical Standards: conflict of interest/financial disclosure:

Funding: This study was not funded by anyone.

Ethical approval: All procedures performed in studies involving human participants were in accordance

with the ethical standards of the institutional and national research committee and with the 1964 Helsinki

declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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None.

Conflict of interest

We declare that we have no conflict of interest.

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