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Original Research Article

A comparative study of paperless partograph and modified WHO partograph in management of labour

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ABSTRACT

Background: Maternal mortality ratio (MMR) in India has declined to 97 deaths per lakh in 2020. Though the use of partograph for monitoring of women in labour helped in the decline, several factors have been implicated in the underuse and incorrect use of the modified WHO partograph at all levels of maternity care. A paperless partograph has been designed for use by clinicians in low resource areas as a simple, non-time consuming, two step calculation to monitor progress of labour, the time to intervene or to transfer a woman to higher centres with facilities for caesarean section. Aim of the study was to compare paperless partograph and modified WHO partograph in the management of labour.
Methods: 1040 women who were admitted in labour room were selected and divided into two equal. Group A women were assessed during labour using modified WHO partograph and Group B women using paperless partograph. Outcome was observed were: Spontaneous normal delivery or assisted normal delivery or caesarean section, duration of labour, no. of women delivering before or at ALERT ETD, between ALERT and ACTION ETD and others delivering beyond ACTION ETD, indication for caesarean section if done. Foetal outcome was also recorded: APGAR scores, NICU admissions (reason of admission, duration of stay, outcome and compared.
Results: There was no significant difference in mode of delivery between both the partographs (p-value= 0.771488). The outcome in terms of time taken from 4 cm to to delivery and delivery in relation to Alert and Action line / ETD was comparable.
Conclusions: Paperless partograph can be easily used in place of modified WHO partograph in low resource settings with similar outcome.

Keywords: Estimated time of delivery, Maternal mortality ratio, Modified WHO partograph, Paperless partograph

INTRODUCTION

Maternal mortality ratio (MMR) in India has declined to 97 deaths per lakh in 2018-2020.[1] More than one third of maternal deaths, half of stillbirths and a quarter of neonatal deaths result from complications during labour and childbirth.[2,3] Improving the quality of care around the time of birth by monitoring of labour using partograph has been identified as the most impactful strategy for reducing stillbirths and maternal and new-born deaths, compared with antenatal or postnatal care strategies.[4]

The modified WHO partograph, recommended as a part of Safe Motherhood initiative developed by WHO in 2000, is highly effective in reducing complications with better neonatal outcome. It helps in making the correct decisions regarding the augmentation, timely caesarean section and timely transfer to higher centre.[5] However, 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, inadequate staff at the facilities, lack of supervision, and negative attitudes among some of the

health workers.[6] In resource-poor countries, problems of paucity of skilled labour, increased delivery load, lack of basic amenities for foetal monitoring leads to challenges faced by treating obstetrician. The paperless partograph designed by Dr Debdas for use by clinicians in low resource areas is a simple, non-time consuming, two step calculation 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.[7] Aim of the study was to compare paperless partograph and modified WHO partograph in the management of labour.

METHODS

The study was conducted in a tertiary care hospital, from October 2022 till March. Women admitted in labour room with single, live, term pregnancy in vertex presentation with spontaneous labour, suitable for vaginal delivery and cervical dilatation of four or more centimetres were selected. Women with previous caesarean section, any medical disorder or any congenital anomaly or foetal distress at the start of study were excluded. There were 520 patients in each group. Group A women were monitored during labour using modified WHO partograph and Group B women using paperless partograph. In Group A women, plotting of WHO partograph was begun after the women reached a cervical dilatation of four cm or more recorded every four hours. Maternal parameters and foetal condition were monitored as per standard protocol. In Group B cases, after the women had cervical dilatation of four cm or more, the two Estimated Time of Delivery (ETD) were calculated using Friedman's formula of cervical dilatation of 1cm/hour. ALERT ETD was calculated by adding the remaining dilatation to first PV finding and is the time when clinician is alerted to monitor the women closely. ACTION ETD was the time taken by women beyond ALERT ETD to take timely action to avoid prolonged or obstructed labour. It was calculated by adding four hrs to ALERT ETD.

Both ETDs were written in big bold letters on front page of woman's case sheet and ACTION ETD was encircled in red. Maternal condition in terms of general condition, pulse rate, blood pressure and temperature noted. Foetal heart rate was also noted.

Uterine contractions were recorded-C1/2/3 (contractions number/frequency/duration). First per vaginal examination noted at the start of plotting the data of partograph and subsequent PV examination was done every 3 hours or as and when required. The outcome of labour was recorded at the end of every partograph and compared.

RESULTS

The mean age was 25.88±4.26 years in paperless group and 25.66±4.06 years in WHO partograph group. Around 90% of the women in paperless partograph group and 89.4% in WHO partograph one presenting to hospital were booked for their antenatal care under Janani Suraksha Yojana (JSY) and Janani Shishu Suraksha Karyakram (JSSK). 78.7% of women were Gravida 1 or 2 in paperless partograph group and 78.06% in WHO partograph group. 2.88% in Paperless partograph group and 3.65% in WHO partograph group were illiterate. The two groups were statistically similar (Table 1).

Table 1: Characteristics of study population.

		Paperless partograph (n=520) (%)	Modified WHO partograph (n=520) (%)
Age (years)	Mean	25.88±4.26	25.66±4.06
Literacy level	Illiterate	2.88	3.65
Booking status	Booked	90	89.4
Gravid	≤2	78.7	78.06

Table 2: Mode of delivery.

Mode of delivery	Paperless partograph (n=520)		Modified WHO partograph (n=520)	
	N	%	N	%
Spontaneous normal delivery	493	94.8	493	94.8
Caesarean section	26	5	27	5.19
Instrumental delivery	1	0.19	-	-

It was observed that 94.8% in paperless partograph group and 94.8% in modified WHO partograph group delivered spontaneously and only 5% in Paperless and 5.19% in WHO partograph group underwent caesarean section. Only one monitored by paperless partograph had instrumental delivery. The difference in mode of delivery between both groups was not significant (Table 2).

95.18% women in paperless and 91.92% in WHO partograph groups took <6 hours to deliver from 4 cm cervical dilatation. Remaining 4.82% in paperless and 8.08% in WHO group took 6-12 hours from 4cm dilatation to delivery (Table 3).

It was observed that 94.8% and 93.07% women delivered before Estimated Time of Delivery (ETD)/Alert line when

monitored by paperless partograph and WHO partograph groups respectively (p value= 0.773).4.8% in paperless partograph group and 5.7% in WHO partograph group delivered between ETD and alert ETD/ and action line (p value= 0.500) and only 2 women (0.4%) in paperless partograph group and 6 (1.15%) in WHO partograph group delivered beyond action ETD/action line (p value=0.157). The difference between the two groups was not statistically significant (p value = 0.28119) considering p<0.05 as significant (Table 4).

Table 3: Time taken to progress from 4 cm to delivery.

Time taken to progress (in hours)		Paperless partograph (n=520)		Modified WHO partograph (n=520)		P value
		N	%	N	%	
4cm to delivery	<3	127	24.42	132	25.38	0.159 (non-significant)
	3-6	368	70.76	346	66.54	
	6-9	22	4.24	38	7.31	
	9-12	3	0.58	4	0.77	
Mean±SD		3.93±1.57		4.00±1.72		

Table 4: Delivery of women in relation to ETD/alert and action line.

Before Alert ETD (PP)/Alert line (WHO P)	Paperless partograph (n=520)		Modified WHO partograph (n=520)		P value
	N	%	N	%	
Before ETD (PP)/alert line (WHO P)	493	94.8	484	93.07	0.773
Between alert ETD and action ETD(PP) and alert line and action line (WHO PP)	25	4.8	30	5.77	0.500
Beyond action ETD (PP)/action line (WHO P)	2	0.4	6	1.16	0.157

DISCUSSION

In the study, the difference in mode of delivery between when monitored by the two partographs was not significant. Veena et al also observed that mode of delivery in 85% of cases monitored by the paperless partograph and 79% cases monitored by WHO partograph had spontaneous delivery. Thus, course of labour with paperless partograph was comparable with that of WHO modified partograph.[6] since similar monitoring criteria and timely intervention were done in the two.

Note: The mean time±SD for PP and WHO P from 4 cm to delivery was 3.93 3.93±1.57 and for WHO partograph group was 4.00±1.72 with no significant difference between the groups.

In studies conducted by Faswila et al, Agarwal et al and Deka et al, it was observed that most of the cases in two groups delivered before reaching the alert line/ETD. They concluded that the paperless partograph was as efficient as the WHO partograph for monitoring labour.[8-10] There was an alert in both groups whenever there was deviation from normal labour and this helped to intervene immediately and improve neonatal outcome.

CONCLUSION

Both paperless partograph and WHO partograph are equally effective in detecting abnormal labour through proper monitoring of women in labour ensuring timely reassessment during labour progress and hence, improve maternal and foetal outcome.

Thus, the paperless partograph being a simple, graphless, 20 second tool to monitor women in labour can be easily used in place of modified WHO partograph in low resource and high patient load settings. This method can be implemented at the peripheral health centres and will help in reducing maternal mortality, without any additional cost.

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