

Original Research Article

Comparison of neonatal outcome after labour monitoring by paperless partograph and modified who partograph

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ABSTRACT

Background: The sustainable development goal (SDG) 3.2 aims to reduce preventable neonatal mortality to 12 deaths per 1,000 live births by 2030. Monitoring of women in labour helps in the decrease, yet the modified WHO partograph is often not used. For use by clinicians in low resource areas, a paperless partograph has been developed. It is a simple, quick, easy to learn calculation to help monitor the progress of labour. One can decide the time to take action or to transfer a woman to another centre. The aim of the study was to compare neonatal outcome when labour is monitored by paperless partograph and modified WHO partograph.

Methods: 1040 women admitted in labour room were divided into two groups. and assessed during labour using Modified WHO partograph (group A) or using paperless partograph (group B). Neonatal outcome of two groups was observed and compared in terms of APGAR scores, NICU admissions (rate, reason and duration of admission).

Results: The Apgar score at 5 minutes was >7 for 99.03% in the paperless partograph and 98.07% in WHO partograph groups. There was no significant difference between the NICU admission rates, duration or reason in the two groups.

Conclusions: Since the outcome in the two groups is similar, paperless partograph can replace modified WHO partograph for monitoring of the labour in low resource settings.

Keywords: Modified WHO partograph, Neonatal mortality rate, Neonatal outcome, Paperless partograph

INTRODUCTION

India's neonatal mortality rate (NMR) was 20 per 1,000 live births in 2020.¹ The sustainable development goal (SDG) 3.2 aims to reduce preventable neonatal mortality to 12 deaths per 1,000 live births by 2030.²

One of the major causes of maternal deaths - prolonged and obstructed labour leads neonatal mortality and morbidity.³ Monitoring of women closely in labour will help reduce these adverse outcomes. The WHO modified partograph is highly effective in reducing complications and is associated with better neonatal outcome. It helps in making the correct decisions regarding the augmentation, timely caesarean section and timely transfer to higher centre.⁴ This is because implementation of a partograph

implies a functioning referral system with essential obstetric functions in place and its use improves the efficiency and effectiveness of maternity services. However, its use is limited due to lack of availability, training and time restrains.

The paperless partograph has been designed for use in low resource areas as a simple, less-time consuming, requiring only simple addition, identifying slow progress of labour.⁵

METHODS

The prospective comparative study was conducted in Zenana Hospital, Jaipur, a teaching hospital, from October 2022 till March 2023. Institutional review board and ethical committee clearance was taken before proceeding

with data collection. Women admitted in labour room with labour pains with full term singleton pregnancy and normal foetal heart rate for were selected. Plotting was started when cervical dilatation was four or more centimetres were selected. Women with any medical disorder, congenital anomaly, previous caesarean section, at the start of study were excluded. There were 520 patients in each group. One group was monitored using modified WHO partograph as per protocol and second group using paperless partograph where after the women had cervical dilatation of four cm or more, Using Friedman's Formula of cervical dilatation of 1 cm/hour, the alert expected time of delivery (ETD) was calculated. 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 calculated by adding four hours to alert ETD, to take timely action to avoid prolonged or obstructed labour.

On front page of woman's case sheet, both ETDs were written. Action ETD was encircled in red. Uterine contractions were recorded- C1/2/3 (contractions number/frequency/duration). First per vaginal

examination noted at the start, subsequent PV examination was done every 3 hours or as and when required.

Maternal parameters and foetal condition were monitored as per standard protocol. Neonatal outcome was recorded and compared. P value <0.05 was taken as significant. Medcalc 16.4 version software was used for all statistical calculations.

RESULTS

The mean age was around 25 years, similar in both group. Most of the women in presenting to hospital were booked for their antenatal care under Janani Shishu Suraksha Karyakram (JSSK). 78% of women were gravida 1 or 2. The two groups were statistically similar. 95.5% and 94.4% women were home makers in paperless and WHO partograph respectively. 57.6% and 60.19% women in paperless and WHO partograph groups respectively resided in rural areas. 52.30% women in paperless partograph and 45.76% in WHO partograph group were educated till 10th standard or less. The two groups were statistically similar.

Table 1: Neonatal outcomes.

	APGAR score at 1 minute			APGAR score at 5 minutes		Neonatal outcome	
	1-3	4-7	>7	4-7	>7	Alive	Mortality
Paperless partograph (n=520)	-	37 7.11%	483 92.88%	5 0.96%	515 99.03%	518 99.6%	2 0.3%
Modified WHO partograph (n=520)	2 0.38%	39 7.5%	479 92.11%	10 1.92%	510 98.07%	520 100%	-
P value	P value =0.355 (non-significant)			P value =0.30 (non-significant)		P value =0.479 (non-significant)	

Table 2. Duration of NICU admission.

Duration in NICU (days)	Paperless partograph (n=520)		WHO partograph (n=520)		
	N	%	N	%	
1-3	4	0.76	5	0.96	P value =0.64 (non-significant)
4-7	14	2.69	14	2.69	
7-14	4	0.76	6	1.15	
>14	4	0.76	1	0.19	
Total	26		26		
Mean±SD	7.86±8.52		6.44±7.52		

Table 3. Indications of NICU admission.

Indications	Paperless partograph (n=26)		Modified WHO partograph (n=26)		Test of significance- chi-square test
	N	%	N	%	
Meconium aspiration	11	42.30	10	38.46	Chi-square =1.19 P value= 0.755 (Non-significant)
Low birth weight	5	19.23	6	22.22	
Respiratory distress	9	34.61	10	37.03	
Neonatal asphyxia	1	3.84	-	-	

The Apgar score at 1 minute was >7 for 92.88% in the Paperless partograph group. Similarly, it was >7 for 92.11% in the WHO partograph. It was 4-7 for 7.11% neonates in the Paperless partograph group and 7.5% in WHO partograph group. The Apgar score at 5 minutes was >7 for 99.03% in the paperless partograph group and 98.07% in WHO partograph group.

99.6% neonates in paperless partograph and 100% in modified WHO partograph were born alive. 2 neonates in paperless partograph group succumbed to death due to meconium aspiration and respiratory distress respectively. There was no significant difference in neonatal outcomes between the paperless partograph and the WHO partograph (Table 1).

26 out of 520 neonates (5%) in the paperless partograph and in the WHO partograph group each were admitted in the NICU.

It was observed that 95% neonates in paperless partograph and in the modified WHO partograph did not require admission to NICU. 3.45% neonates were admitted for <7 days in NICU in paperless and 3.65% neonates in WHO partograph groups. There was no significant difference between the NICU admission rates of the neonates in the two groups (Table 2).

In paperless partograph group, 40.7% neonates were admitted due to meconium aspiration, 37% were due to respiratory distress and 18.5% were due to low birth weight and only 1 neonate was admitted for neonatal asphyxia. Similarly, in WHO partograph group 38.46% neonates were admitted for meconium aspiration, 37.03% for respiratory distress and 22.22% for low birth weight. The reasons for NICU admission of neonates were similar in the two groups (Table 3).

DISCUSSION

The mean APGAR score at 1 minute for paperless partograph group was 7.82 ± 0.64 and for WHO partograph group 7.79 ± 0.75 . No statistically significant difference was seen between the APGAR score at 1 and 5 minutes. Similar results were obtained in the study conducted by Thakur et al.⁶ Also, there was no significant difference in NICU admission rate or duration between the two partographs.

On analysing the perinatal outcome in a study by Deka et al, it was found that the average APGAR score after 1 min was 8.1 ± 1.7 in group A and 8.3 ± 0.7 in group B respectively ($p=0.12$). The Apgar score after 5 mins had an average of 9.6 ± 0.7 in cases randomized to the WHO partograph and 9.45 ± 1.6 in those subjected to the Paperless one. Thus, similar perinatal outcome was seen in both groups which had no statistically significant difference.⁷

Neonatal outcomes with no statistically significant difference between both the groups was also observed in the study done by Bansal et al.⁸

Mohammed et al reported that the average Apgar score after 1 minute and 5 minutes were (8.7 ± 0.4 and 99.9 ± 0.1 respectively), indicating that no newborn required neonate intensive care unit (NICU) admission or ventilation. This revealed the positive effect of paperless partogram on neonatal outcome.⁹

In the present study, the primary reasons for NICU admission were meconium aspiration and respiratory distress. Similarly, NICU admission was found in 5%. Major indication was also meconium aspiration as observed by Reshma et al.¹⁰ Fatouh et al, on analysing the perinatal outcome found that there was no statistically significant difference between the two studied groups (paperless versus WHO partograph) as regard to perinatal outcomes.¹¹

This was because the monitoring of labour done by using either of the partographs resulted in early detection and action of any deviation from normal.

Finding similar outcomes, Asha Jain et al also suggested that the paperless partogram was a simplified method to manage the active stage of labour that needs advocacy among caregivers, mostly in low-skilled and/or staffed settings.¹²

The study was performed in a tertiary care centre by gynecologists, which may not be representative of competence of the staff at peripheral hospitals. Hence more studies would be needed at their level.

CONCLUSION

Paperless partograph was equally effective in detecting abnormal labour, ensuring timely reassessment during labour, thus with similar neonatal outcome. It is simple, cost effective, easy to learn and use and less time consuming. Hence it can be implemented at the peripheral health centres, helping in reducing the neonatal mortality.

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