International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
Indexing: Embase
Impact Factor (RJIF): 6.71

www.gynaecologyjournal.com
2025; 9(6): 1269-1273
Received: 17-08-2025
Accepted: 22-09-2025

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Comparison of labour outcome using the new who labour care guide versus standard partogram in a tertiary care hospital in Kashmir

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DOI: https://www.doi.org/10.33545/gynae.2025.v9.i6g.1788

Abstract
Background: Labor monitoring is crucial for ensuring maternal and neonatal well-being. The traditional WHO Partograph and the WHO Labor Care Guide (LCG) are two widely used tools for monitoring labor progression. This study aimed to compare maternal and neonatal outcomes between labor monitored using the WHO Partograph and the WHO LCG among women delivering at a tertiary care hospital in Kashmir, India.
Methods: This prospective observational comparative study was conducted at the Postgraduate Department of Obstetrics and Gynaecology, Lal Ded Hospital, Government Medical College Srinagar, over 18 months (July 2022 - December 2023). A total of 200 pregnant women with low-risk pregnancies were enrolled and randomized into two groups: Group A (labor monitored with the WHO Partograph) Group B (labor monitored with WHO LCG). Labor parameters, delivery outcomes, maternal complications, neonatal and patient satisfaction were analyzed using descriptive and inferential statistics (SPSS v22), with $p < 0.05$ considered statistically significant.
Results: Both groups had comparable sociodemographic characteristics ($p > 0.05$). There was no significant difference in mode of delivery (80% vs. 85% normal vaginal deliveries; $p = 0.889$), duration of labor stages ($p > 0.05$), or need for labor augmentation ($p > 0.05$). Maternal complications, including postpartum hemorrhage (10% vs. 8%; $p = 0.677$) and perineal trauma (5% vs. 4%; $p = 0.448$), were also similar between groups. Neonatal outcomes, including birth weight ($p = 0.570$), Apgar scores at 1 and 5 minutes ($p > 0.05$), and NICU admissions (7% vs. 6%; $p = 0.234$), were comparable. However, patient satisfaction was significantly higher in the WHO LCG group (95% vs. 82%, $p = 0.004$), and attendant satisfaction was greater (94% vs. 75%, $p = 0.001$).
Conclusion: Both the WHO Labor Care Guide and the Partograph were effective in monitoring labor with no significant differences in maternal and neonatal outcomes. However, the WHO LCG demonstrated superior patient and attendant satisfaction, emphasizing its potential as a preferred labor monitoring tool.

Keywords: Labor Monitoring, WHO Labor Care Guide, Partograph, Maternal Outcomes, Neonatal Outcomes

Introduction
Childbirth is a transformative and celebratory event for most women, yet it carries inherent risks requiring vigilant monitoring [1]. Labor, a physiological process through which the fetus, membranes, umbilical cord, and placenta are expelled, is divided into three stages [1]. Despite advancements, significant fetal and maternal risks remain during labor, highlighting the need for meticulous monitoring to safeguard maternal and neonatal health [3].
Labor monitoring involves assessing uterine contractions, cervical dilation, fetal descent, and position. Advances like electronic fetal monitoring (EFM) and ultrasound have enhanced assessments, allowing real-time tracking of fetal heart rate (FHR) and uterine contractions [4]. These methods provide critical insights into labor progression and fetal well-being. Additionally, tools like the partograph, a graphical representation of labor progress, have been instrumental in identifying deviations and preventing complications like prolonged labor and PPH [5].
The World Health Organization's Labor Care Guide (WHO LCG) is a recent innovation prioritizing respectful maternity care and minimizing unnecessary interventions. Unlike the partograph, WHO LCG focuses on the entire labor experience, emphasizing continuous monitoring during the second stage to ensure maternal and fetal well-being [6]. Parameters such as uterine contractions, FHR, maternal vitals, and fetal descent are closely observed. The guide

advocates for maternal positions facilitating labor and identifies the need for timely interventions, including instrumental delivery [7].

Comparing the partograph and WHO LCG reveals both tools' strengths in improving labor outcomes. While the partograph offers precise, quantitative analysis, the WHO LCG emphasizes individualized, holistic care [8]. The choice between them depends on healthcare resources, training, and the care philosophy. However, direct comparisons between these modalities remain limited, particularly in India.

This study aimed to compare labor outcomes using the WHO Labor Care Guide versus the standard partograph among women delivering at a tertiary care hospital in Kashmir, India. The research seeks to evaluate the effectiveness of these tools in enhancing labor management and improving maternal and neonatal outcomes.

Materials and Methods

Study design and area

The study was conducted in the Postgraduate Department of Gynaecology and Obstetrics at Lal Ded Hospital, Govt. Medical College Srinagar, over a period of 18 months (from July 2022 to December 2023) after obtaining clearance from the Institutional Ethical Committee and written informed consent from the patients. It was a prospective observational comparative study.

Study population

Patients presenting to the study institution in labor were monitored with either WHO Standard partograph or WHO Labor Care Guide (LCG) and the outcomes of their labor were assessed.

Inclusion Criteria: Pregnant women presenting to the study institution with low Risk pregnancies in a labor and scheduled for delivery.

Exclusion Criteria

- Patients with severe anemia.
- Patient with hypertension, diabetes mellitus, renal disease, or pulmonary disease
- Patients with obstetric complications like pre-term birth, multiple gestation, previous cesarean delivery, breech position, postdated pregnancy, or bad obstetrical history

Sample size and sampling technique

The sample size for the present study was calculated based on the formula for the calculation of sample sizes from two proportions:

Neach group = Z1-α/22 X (p1q1 + p2q2) / (p1 - p2)2

Where $Z_{1-\alpha/2}$ is the critical value at α level of confidence, p_1 and p_2 are the proportion of outcomes of interest (rates of cesarean section) in group I (partogram) and group II (WHO Labor care guide) respectively. Considering α of 95%, and p_1 and p_2 17.8% and 8.5% as per the findings of Pandey *et al*., the calculated sample size for the present study was 99.5, which was rounded up to 100 patients in each of the study groups [9]. A block randomization sampling methodology was utilized in order to allocate 200 patients in each of the study groups.

Study methodology

Each of the patient when recruited into either of the two study groups, they underwent an interview using a predesigned, pretested questionnaire. In the partogram group, the patients underwent labor monitoring using the standard partograph. On the other hand, in the labor care group, the labor was monitored using the WHO Labor care guide (2020). Throughout the study period, the accurate and complete entry of every LCG plot and partogram plot was ensured. In the LCG group, active phase of labor began with 5cm of cervical dilation. Maternofetal monitoring followed LCG parameters, highlighting alert thresholds that triggered corresponding interventions, such as starting oxytocin when uterine contractions m*et al*ert criteria. Specific lag times for each centimeter of dilation were also provided, and the alert was triggered if progress lagged beyond these times. The LCG followed an "action-oriented labor" approach, where parameters were assessed, recorded, and checked against alert thresholds to determine the next management step. The partograph group started active labor management from 4 cm cervical dilation, with deviations from alert or action lines prompting reevaluation or intervention. Oxytocin was initiated in cases of inadequate contractions. The decision-making role of each partograph was analyzed in both groups.

In the LCG group, protracted or arrested labor was defined a condition in which cervical dilation fails to progress beyond specific measurements for an extended duration. This includes dilation remaining at 5 cm for 6 hours or more, 6 cm for 5 hours or more, 7 cm for 3 hours or more, 8 cm for 2.5 hours or more, or 9 cm for 2 or more hours. In contrast, the partogram group defined protracted or arrested labor as minimal or no progress in cervical dilation or descent of the fetal head during the active phase of labor (4 cm or more) for at least 4 hours with adequate uterine contractions or 6 hours with inadequate contractions, even after administering the maximum permissible dose of oxytocin. Adequate contractions were characterized by a frequency of 3 to 5 contractions every 10 minutes, each lasting 30 to 40 seconds, with an increase in intensity or perceived progressive pain by the parturient. For labor augmentation, oxytocin was initially administered at 1 mIU/min, and the dosage was increased by 1 to 2 mIU/min every 20 to 30 minutes until reaching a maximum of 32 mIU/min or achieving adequate contractions, whichever occurred first.

Data management and statistical analysis

The collected data were checked for consistency, completeness and entered into Microsoft Excel (MS-EXCEL, Microsoft Corp.) data sheet. Analyzed with the statistical program Statistical Package for the Social Sciences (IBM SPSS, version 22). Data were organized and presented using the principles of descriptive and inferential statistics. The data were categorized and expressed in proportions. The continuous data were expressed as mean±SD. The data were graphically presented in the form of tables, vertical bars, horizontal bar, pie diagram. Where analytical statistics were performed, a p-value of <0.05 was considered to be statistically significant for the purpose of the study. For analytical statistics, Chi-square test was used for categorical data and student's t-test was used for continuous data.

Ethical consideration

The Institutional Ethics Committee of study institution reviewed and approved the project before it was carried out. All of the participants were informed in their own language about the study and their rights for participation before providing data for the researcher-administered questionnaire. They were informed about the participant's role and rights, to clarify that their

participation was voluntary, the information was treated confidentially, and they could withdraw from the study at any time. After the collection of data, the data was cleaned, anonymized and stored in a password protected spreadsheet for data analysis.

Results

The results of this study, as outlined in the tables, provide comprehensive insights into the sociodemographic characteristics, delivery outcomes, adverse outcomes, and patient satisfaction between two groups monitored using the WHO Labor Care Guide (Group A) and the traditional partograph (Group B).The study enrolled 200 participants evenly divided into Group A and Group B. The mean age and gestational age were comparable between groups ($p = 0.445$ and $p = 0.951$, respectively), with 41% of participants in each group being primigravida. Most participants were from rural areas and socioeconomic class IV ($p = 0.091$ and $p = 0.740$, respectively). (Table 1)

Delivery mode distribution showed no significant difference. Normal vaginal deliveries (NVD) occurred in 80% of Group A and 85% of Group B participants ($p = 0.889$). Cesarean sections due to fetal distress, non-descent of the head, and arrest of dilation were infrequent and similar across the groups ($p > 0.05$). The active stage of labor duration was shorter in multigravidas compared to primigravidas, yet this difference was consistent between groups. For primigravidas, 83.3% in Group A and 78.8% in Group B had an active labor duration of less than 6 hours ($p = 0.211$). Multigravidas predominantly experienced an active labor duration under 2 hours in both groups ($p = 0.292$). Similar trends were observed in the first and second stages of labor, with no significant differences between the groups ($p > 0.05$). The proportion of women in either of the two study groups who required augmentation were also statistically non-significantly similar. This was true for both primi ($p = 0.334$) and multigravida ($p = 0.122$) women. (Table 2)

Adverse maternal outcomes such as postpartum hemorrhage (PPH) and perineal trauma occurred infrequently, with no significant intergroup differences (PPH: 10% in Group A vs. 8% in Group B, $p = 0.677$; perineal trauma: 5% in Group A vs. 4% in Group B, $p = 0.448$). Importantly, there were no maternal or neonatal deaths in either group. Birthweight and APGAR scores at 1 and 5 minutes were comparable, indicating similar neonatal health outcomes ($p > 0.05$). Admission to the neonatal intensive care unit (NICU) was slightly higher in Group A (7%) compared to Group B (6%), but this difference was not statistically significant ($p = 0.234$). (Table 3)

Patient satisfaction significantly favored the WHO Labor Care Guide (Group B). Among patients, 82% in Group A and 95% in Group B reported being satisfied with their care ($p = 0.004$). Satisfaction among attendants was also higher in Group B, with 94% expressing satisfaction compared to 75% in Group A ($p = 0.001$). (Table 4)

Discussion

This study compared the outcomes of labor monitoring using the WHO Labor Care Guide (LCG) versus the standard partograph in a tertiary care hospital. LCG has recently gained much traction as a viable alternative of partogram in the monitoring of labor in obstetric suites across the world. An important strength of the LCG is its alignment with updated labor management guidelines that prioritize patient-centered care. Hofmeyr *et al*. highlighted the LCG's transition from traditional alert and action lines to evidence-based benchmarks, improving the accuracy of labor monitoring and reducing unnecessary interventions [10]. The LCG also incorporates parameters that encourage supportive labor practices, such as maternal positioning and continuous monitoring during the second stage, aligning with global trends in respectful maternity care.

The present study found that duration of labor across various stages was comparable in both groups, indicating that the tools were equally effective in managing labor progression. Rajpriya *et al*. demonstrated that simplified monitoring tools like the LCG are as effective as traditional partographs in tracking labor progression while being easier to use [11]. The LCG's evidence-based benchmarks for cervical dilation, as discussed by Hofmeyr *et al*., likely contributed to this consistency, enabling healthcare providers to identify deviations and intervene appropriately [10]. It was also seen that the mode of delivery was also similar between the groups. There was seen a lower cesarean section rate for arrest of dilation in the LCG group (3%) compared to the partograph group (7%). This aligns with findings by Pandey *et al*., who demonstrated a significantly lower primary cesarean delivery rate in the LCG group. The structured monitoring and action thresholds provided by the LCG likely enabled earlier and more precise interventions, reducing the occurrence of protracted labor. Similarly, Bernitz *et al*. found that adherence to labor progression guidelines, whether using the partograph or alternative frameworks like Zhang's curve, did not significantly alter intrapartum cesarean section rates [12]. These findings highlight the potential of the LCG to optimize labor outcomes by promoting timely decision-making, a notion also emphasized by Hofmeyr *et al*. (2021), who discussed how the LCG's evidence-based benchmarks could enhance clinical care.

Maternal adverse outcomes, such as postpartum hemorrhage (PPH) and perineal trauma, showed no significant differences between the two groups. This concurs with Sospeter *et al*., who reported similar rates of PPH and maternal trauma when comparing the LCG and partograph [13]. Although no significant differences were observed, the LCG's focus on individualized care and prompt interventions offers promise for improved maternal outcomes in diverse populations. Hofmeyr *et al*. underscored the importance of the LCG's modifications, such as the removal of contraction strength measurements, which often proved challenging in clinical practice, and the incorporation of second-stage labor monitoring to address maternal safety comprehensively [10].

Neonatal outcomes, including birthweight, APGAR scores, and NICU admissions, were also comparable between the groups, mirroring the results of Pandey *et al*. Their study noted no significant differences in neonatal outcomes, despite the shorter duration of active labor in the LCG group. This suggests that the LCG ensures fetal safety without compromising neonatal outcomes, even as it emphasizes timely interventions. Additionally, Yash *et al*. observed that the LCG supports the identification of fetal distress and enables appropriate responses, reinforcing its utility in improving neonatal care without increasing unnecessary interventions [14].

Patient satisfaction emerged as a key area where the LCG outperformed the partograph. In this study, 95% of participants in the LCG group expressed satisfaction compared to 82% in the partograph group. This is supported by Pingray *et al*., who highlighted that the LCG's design promotes respectful maternity care and shared decision-making, enhancing the overall birthing experience [15]. Similarly, Patabendjge *et al*. extolled the LCG's woman-centered approach, emphasizing its role in fostering positive patient-provider interactions and improving maternal confidence during labor [16].

The study's findings support the feasibility of implementing the LCG in resource-limited settings without compromising labor outcomes. The structured and actionable format of the LCG ensures that labor management is both systematic and adaptable to different healthcare environments. Patabendjge *et al*. emphasized that the LCG, while user-friendly, requires adequate training and a supportive infrastructure to maximize its potential [16]. This aligns with Sospeter *et al*., who called for larger-scale studies to evaluate the LCG's performance in high-risk pregnancies and busy labor wards [13].

Despite the comparable clinical outcomes observed in this study, the LCG's superior performance in patient satisfaction underscores its potential as a preferred tool in labor management. By emphasizing respectful care and shared decision-making, the LCG addresses critical gaps in traditional partograph use, as noted by Pingray *et al*. (2021). Moreover, the reduced cesarean section rates and maintained neonatal outcomes associated with the LCG highlight its efficacy as a modern, evidence-based alternative.

Table 1: Sociodemographic characteristics of the participants (n=200)

Parameters	Group A (n=100)	Group B (n=100)	p-value
Mean age	25.3±0.5	25.9±0.6	0.445
Rural residence	75	64	0.091
Socioeconomic status as per B.G Prasad Scale			
I	2	1	0.740
II	15	21	
III	29	25	
IV	47	44	
V	7	9	
Parity			
1	41	41	0.445
2	20	31	
3	34	19	
4	5	9	
Mean gestational age (weeks)	38.4±1.1	38.4±1.2	0.951
Mean BMI	22.4±4.1	22.2±3.6	0.855
Education			
Primary	23	21	0.136
Secondary	36	49	
Higher secondary	27	15	
Graduate	14	15	

Table 2: Delivery outcome related characteristics of the participants (n=200)

Parameters	Group A (n=100)	Group B (n=100)	p-value
Mode of delivery			
NVD	80	85	0.889
LSCS due to acute fetal distress	10	9	0.772
LSCS due to non-descent of head (SECOND STAGE LSCS)	3	3	1.000
LSCS due to Non progression of labor (Arrest of Dilatation)	7	3	0.466
Duration of active stage of labor			
Primi (n=63)			0.211
<6 hours	25 (83.3)	26 (78.8)	
6-12 hours	5 (16.7)	7 (21.2)	
Multi (n=102)			0.292
<2 hours	45 (90)	45 (86.5)	
2-4 hours	5 (10)	7 (13.5)	
Duration of first stage of labor			
Primi (n=63)			0.461
<12 hours	28 (93.3)	29 (87.8)	
12-18 hours	2 (6.7)	4 (12.2)	
Multi (n=102)			0.324
<8 hours	47 (94%)	46 (88.4%)	
8-12 hours	3 (6%)	6 (11.6%)	
Duration of second stage of labor			
Primi (n=63)			0.905
<60 minutes	6 (20%)	7 (21.2%)	
60-120 minutes	24 (80%)	26 (78.8%)	
Multi (n=102)			0.915
<30 minutes	37 (74%)	38 (73.1%)	
30-60 minutes	13 (26%)	14 (26.9%)	
Augmentation required			
Primi (n=63)	14 (42%)	11 (36.6%)	0.334
Multi (n=102)	13 (26%)	9 (18%)	0.122

Table 3: Adverse outcome related characteristics of the participants (n=200)

Parameters	Group A (n=100)	Group B (n=100)	p-value
Adverse maternal and delivery outcomes			
PPH	10	8	0.677
Perineal trauma	5	4	0.448
Maternal death	0	0	-
Stillbirth	0	0	-
Adverse birth outcomes	0	0	
Birthweight	3.1±0.5	3.2±0.5	0.570
APGAR at 1 min	7.8±0.9	8.1±0.8	0.168
APGAR at 5 mins	8.8±0.5	8.8±0.5	0.683
NICU	7	6	0.234
Neonatal death	0	0	-

Table 4: Patient satisfaction characteristics of the participants (n=200)

Patient satisfaction	Group A (n=100)	Group B (n=100)	p-value
Patient satisfied	82	95	0.004*
Attendants satisfied	75	94	0.001*

*Statistically significant

Conclusion

In conclusion, this study demonstrated that the WHO Labor Care Guide is comparable to the standard partograph in terms of maternal and neonatal outcomes but surpasses it in patient satisfaction. The LCG's evidence-based benchmarks and emphasis on woman-centered care position it as a promising alternative for labor monitoring. The findings reinforce the potential of the LCG to enhance labor management practices while promoting positive birthing experiences.

Conflict of Interest

Not available.

Financial Support

Not available.

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How to Cite This Article

Fayaz I, Qureshi A, Iqbal A. Comparison of labour outcome using the new who labour care guide versus standard partogram in a tertiary care hospital in Kashmir. International Journal of Clinical Obstetrics and Gynaecology. 2025;9(6):1269-1273.