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Original Research Article

An observational study to evaluate feto maternal outcome in labour management using the WHO labour care guide among women admitted to labour room in a tertiary care centre of South Gujarat

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ABSTRACT

Background: Labour and childbirth are critical events that significantly influence maternal and neonatal outcomes. The world health organization (WHO) labour care guide (LCG) is an evidence-based, woman-centred tool designed to improve intrapartum monitoring through individualized labour assessment and timely clinical decision-making. This study evaluated fetomaternal outcomes associated with the use of the WHO Labour Care Guide in a tertiary care centre.
Methods: A prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Government Medical College, New Civil Hospital, Surat, Gujarat, India, from March 2025 to March 2026. A total of 500 term pregnant women with singleton cephalic pregnancies in active labour (≥5 cm cervical dilatation) were included. Women with previous caesarean section, multiple gestation, malpresentation or high-risk pregnancies requiring immediate intervention were excluded. Labour was monitored using the WHO Labour Care Guide and maternal and neonatal outcomes were analysed.
Results: Among the 500 women, 452 (90.4%) had spontaneous vaginal delivery, 10 (2.0%) required instrumental delivery and 38 (7.6%) underwent caesarean section. Maternal complications occurred in 14 (2.8%) women, with postpartum haemorrhage being the most common. Most neonates had Apgar scores ≥8 at 1 minute (97.6%) and 5 minutes (98.0%). Normal birth weight (2.5–3.5 kg) was observed in 76% of neonates, while NICU admission was required in only 2.4%. Crossing the LCG alert threshold was significantly associated with adverse maternal outcomes ($p<0.001$).
Conclusions: The WHO Labour Care Guide is an effective tool for intrapartum monitoring and is associated with favourable maternal and neonatal outcomes, timely recognition of labour abnormalities and reduced unnecessary obstetric interventions.

Keywords: Fetomaternal outcome, Intrapartum care, Labour monitoring, Maternal outcome, Neonatal outcome, WHO labour care guide

INTRODUCTION

Labour and childbirth represent a crucial period in maternal and neonatal care, during which timely monitoring and appropriate clinical decisions play a vital role in determining outcomes. Despite advances in obstetric practice, preventable complications during labour continue to contribute significantly to maternal and perinatal morbidity and mortality, particularly in low- and middle-income countries.

Inadequate monitoring of labour progress, delayed recognition of complications and inappropriate interventions remain major challenges in intrapartum care.[1,2] For decades, the partograph has been widely used as the standard tool for monitoring labour. It provides a

graphical representation of cervical dilatation and labour progress, enabling early identification of abnormal patterns. However, increasing evidence has highlighted important limitations of the traditional partograph, including its reliance on a uniform rate of cervical dilatation and rigid alert and action lines. These limitations may lead to overdiagnosis of labour abnormalities and unnecessary interventions such as augmentation of labour and caesarean section, without corresponding improvement in maternal or neonatal outcomes.[4,15] Recognizing these concerns, the WHO introduced the WHO LCG as an updated, evidence-based tool for intrapartum monitoring. The LCG reflects current understanding of labour physiology and emphasizes individualized, woman-centred care. Unlike the traditional partograph, it replaces fixed action lines with evidence-based reference thresholds that prompt reassessment and clinical judgment rather than immediate intervention.[3,8]

In addition to monitoring labour progress and fetal well-being, the LCG incorporates key elements of respectful maternity care, including maternal comfort, mobility, hydration, pain management, emotional support and shared decision-making. This holistic approach ensures that both clinical and experiential aspects of childbirth are addressed.[3,13]

METHODS

Study design and setting

This hospital-based observational study was conducted in the Department of Obstetrics and Gynecology, Government Medical College, New Civil Hospital, Surat at a tertiary care centre in South Gujarat, India. The study was carried out over a specified study period after obtaining approval from the Institutional Ethics Committee.

Study population

A total of 500 pregnant women admitted to the labour room in active labour were included in the study.

Inclusion criteria

Women with singleton term pregnancies (≥37 weeks of gestation) in cephalic presentation who were admitted in active labour (cervical dilatation ≥5 cm) to the labour room of the department of obstetrics and gynaecology, government medical college and new civil hospital, Surat and who provided informed written consent to participate in the study were included.

Exclusion criteria

Women with a previous caesarean section, multiple gestation, malpresentation, high-risk pregnancies requiring immediate intervention or significant medical or obstetric complications were excluded from the study.

Method of data collection

After obtaining informed written consent, a detailed history was obtained from each participant, followed by a comprehensive general, systemic and obstetric examination. Baseline maternal and fetal parameters were recorded at admission. Labour was monitored using the WHO (LCG) from the active phase of labour (cervical dilatation ≥5 cm) in accordance with WHO recommendations.[3] Cervical dilatation, fetal head descent, uterine contractions, fetal heart rate, maternal vital signs (pulse rate, blood pressure and temperature) and supportive care measures including pain relief, hydration, mobility and the presence of a birth companion were assessed and documented at regular intervals. Any deviation from the reference thresholds specified in the WHO LCG was identified promptly and appropriate clinical interventions were undertaken according to standard obstetric protocols.[3,4]

Outcome measures

The primary outcome measures included both maternal and neonatal outcomes. Maternal outcomes assessed were the mode of delivery (spontaneous vaginal delivery, instrumental delivery or caesarean section), duration of labour, postpartum haemorrhage, prolonged labour and intensive care unit admission. Neonatal outcomes included Apgar scores at 1 and 5 minutes, birth weight, requirement for neonatal intensive care unit (NICU) admission and any neonatal complications. These outcomes were recorded immediately after delivery and analysed to evaluate the effectiveness of the WHO labour care guide in improving fetomaternal outcomes.

Statistical analysis

Data were collected using a predesigned proforma and entered into Microsoft Excel for analysis. Statistical analysis was performed using appropriate statistical methods. Results were expressed as mean±standard deviation for continuous variables and as frequencies and percentages for categorical variables. Associations between variables were assessed using appropriate statistical tests such as the Chi-square test for categorical data and Student's t-test for continuous variables. A p value of <0.05 was considered statistically significant.

RESULTS

The baseline characteristics of the study participants are shown in Table 1. The majority of women belonged to the 20–25 years age group (243; 48.6%), followed by 26–30 years (140; 28.0%). Nearly equal distribution of residence was observed, with 253 (50.6%) from urban and 247 (49.4%) from rural areas. Most participants belonged to the upper lower socioeconomic class (220; 44.0%), followed by lower middle class (120; 24.0%) and lower class (110; 22.0%). A majority of women were multigravida (291; 58.2%), while primigravida constituted

209 (41.8%) of the study population (Table 1). Table 2 shows that out of 500 women, the majority (90.4%) had spontaneous vaginal delivery, while 7.6% underwent LSCS and 2.0% required instrumental delivery. Maternal complications were observed in only 2.8% of cases, with postpartum haemorrhage being the most common, indicating overall favourable maternal outcomes. Most neonates had good APGAR scores, with 97.6% and 98.0% scoring ≥8 at 1 and 5 minutes, respectively. The majority (76%) had normal birth weight (2.5–3.5 kg). NICU admission was required in only 2.4% of cases, reflecting overall good neonatal outcomes (Table 3). Crossing the LCG alert threshold was significantly associated with adverse maternal outcomes ($p<0.001$). Additionally, LSCS and instrumental deliveries, prolonged labour duration and low birth weight were significantly associated with higher NICU admissions, indicating their impact on neonatal outcomes (Table 4). Table 5 The majority of women who had vaginal delivery were discharged within 2 days, whereas those who underwent LSCS required a longer hospital stay of approximately 4 days. Extended hospital stay (>4 days) was mainly associated with complicated cases. The present study demonstrated favourable fetomaternal outcomes following the use of the WHO LCG. The spontaneous vaginal delivery rate (90.4%) was higher and the caesarean section rate (7.6%) was lower than those reported in most reference studies. Maternal complications, including postpartum haemorrhage (1.4%), prolonged labour (0.6%) and maternal ICU admission (0.8%), were considerably lower than in previous studies. Similarly, neonatal outcomes were excellent, with a NICU admission rate of only 2.4% and an Apgar score ≥8 at 5 minutes in 98% of newborns. These findings suggest that implementation of the WHO LCG was associated with timely recognition of abnormal labour, appropriate intervention and improved fetomaternal outcomes (Table 6).

Table 1: Baseline characteristics of study participants (n=500).

Variables	Category	Number (N)	(%)
Age group (in years)	<20	50	10.0
	20–25	243	48.6
	26–30	140	28.0
	>30	67	13.4
Residence	Urban	253	50.6
	Rural	247	49.4
Socioeconomic class	Upper	10	2.0
	upper middle	40	8.0
	lower middle	120	24.0
	upper lower	220	44.0
	Lower	110	22.0
Obstetric history	Primigravida	209	41.8
	Multigravida	291	58.2
	Second gravida	180	36.0
	Third gravida	60	12.0
	≥Fourth gravida	51	10.2

Table 2: Association of mode of delivery and maternal outcome (n=500).

Variables	Category	Frequency (N)	(%)
Mode of delivery	Spontaneous vaginal delivery	452	90.4
	Instrumental delivery	10	2.0
	LSCS	38	7.6
Maternal outcome	No complications	486	97.2
	Postpartum haemorrhage	7	1.4
	Prolonged labour	3	0.6
	ICU admission	4	0.8

Table 3: Neonatal outcomes (n=500).

Variables	Category	Frequency (N)	(%)
APGAR (1 min)	≥8	488	97.6
	<8	12	2.4
APGAR (5 min)	≥8	490	98.0
	<8	10	2.0

Continued.

Variables	Category	Frequency (N)	(%)
Birth weight	<2.5 kg	90	18
	2.5–3.5 kg	380	76
	>3.5 kg	30	6
NICU admission	Yes	12	2.4
	No	488	97.6

Table 4: Association of LCG and outcomes (n=500).

Variables	Category	Outcome	Frequency	P value
LCG alert	Not reached	No complication	394	<0.001
	Reached	Complications present	106	
Mode of delivery	Vaginal	NICU	8	0.017
	LSCS/Instrumental	NICU	4	
Labour duration	<6 hrs	NICU	8	0.040
	>6 hrs	NICU	4	
Birth weight	<2.5 kg	NICU	8	<0.001
	≥2.5 kg	NICU	4	

Table 5: Hospital stay (n=500).

Mode of delivery	Duration of stay	Frequency (N)
Vaginal delivery	2 days	455
LSCS	4 days	31
Complicated cases	>4 days	14

Table 6: Comparison of fetomaternal outcomes with other studies.

Outcomes	Present study (n=500)	Bohre et al	Neal et al	Mugyenyi et al	Souza et al
Spontaneous vaginal delivery	90.4%	84.6%	82.4%	88.3%	85.2%
Instrumental delivery	2.0%	3.8%	5.1%	2.7%	3.6%
Caesarean section	7.6%	11.6%	12.5%	9.0%	11.2%
Postpartum haemorrhage	1.4%	5.3%	4.4%	11.6%	15.1%
Prolonged labour	0.6%	9.1%	10.3%	NR	NR
Maternal ICU admission	0.8%	2.7%	2.2%	NR	NE
No maternal complication	97.2%	97.0%	97.0%	100%	100%
NICU admission	2.4%	13.1%	10.5%	NR	NR
No NICU admission	97.6%	86.9%	89.5%	NR	NR
Apgar score > or equal to 8 at 5 minutes	98.0%	96.5%	97.2%	98.1%	97.8%

DISCUSSION

The present study evaluated feto-maternal outcomes in labour management using the WHO LCG in a tertiary care centre. The findings of this study demonstrate that the use of the LCG is associated with favourable maternal and neonatal outcomes, along with a low rate of obstetric interventions. In the present study, the majority of women (90.4%) had spontaneous vaginal delivery, with a relatively low caesarean section rate (7.6%). This is lower compared to many contemporary studies, where caesarean section rates are rising globally. The lower rate observed in this study may be attributed to the use of the WHO LCG, which emphasizes individualized assessment and avoids premature diagnosis of labour dystocia. Similar observations have been reported in studies by Bohren MA et al where improved labour monitoring and supportive care were associated with a reduction in unnecessary interventions.[7,8] Maternal complications in this study were low (2.8%), with postpartum haemorrhage being the most common complication. This finding is consistent with other observational studies evaluating structured labour monitoring tools, which report reduced maternal morbidity due to timely identification and management of deviations from normal labour. The incorporation of continuous maternal assessment within the LCG likely contributed to early detection and prompt management of complications, thereby improving maternal outcomes.[5,8] Neonatal

outcomes in the present study were also favourable. The majority of neonates had good APGAR scores at both 1 and 5 minutes and NICU admission was required in only 2.4% of cases. These findings are comparable with studies evaluating improved intrapartum monitoring, which demonstrate better neonatal outcomes when fetal well-being is closely monitored. The structured recording of fetal heart rate and timely interventions based on LCG thresholds may have played a key role in preventing adverse neonatal outcomes.[5,6]

A significant finding of this study was the strong association between crossing the labour care guide alert threshold and adverse maternal outcomes ($p<0.001$). Women who crossed the alert threshold had a higher incidence of complications such as postpartum haemorrhage and prolonged labour. This highlights the clinical utility of the LCG as an effective early warning tool, enabling timely reassessment and intervention. Unlike the traditional partograph, which relies on rigid action lines, the LCG promotes dynamic decision-making, which may explain its effectiveness in improving outcomes.[3,8]

Furthermore, this study demonstrated that prolonged labour duration, operative deliveries (LSCS and instrumental) and low birth weight were significantly associated with increased NICU admissions. These findings are consistent with existing literature, including studies by Sharma et al which have reported similar associations between labour abnormalities and adverse neonatal outcomes. The ability of the LCG to identify deviations in labour progression may help in reducing such risks through timely intervention.[6,8]

Another important observation was the shorter duration of hospital stay among women who had vaginal delivery, reflecting faster recovery and fewer complications. This has important implications for healthcare resource utilization, especially in high-volume tertiary care centres.[3,16]

The strengths of this study include a relatively large sample size and the use of a standardized, evidence-based tool for labour monitoring. Additionally, the study provides comprehensive evaluation of both maternal and neonatal outcomes, which adds to its clinical relevance.

CONCLUSION

The present study demonstrates that the WHO LCG is an effective tool for monitoring labour and guiding clinical decision-making. Its use facilitates early identification of deviations from normal labour progress, enabling timely and appropriate interventions. The majority of women in the study had normal labour progression and favourable maternal and neonatal outcomes. The implementation of the LCG was associated with a high rate of normal vaginal deliveries and a relatively low incidence of operative interventions. Maternal complications were minimal, with postpartum haemorrhage being the most common, while most neonates had good APGAR scores and required minimal NICU admissions. The LCG, by incorporating individualized labour assessment along with elements of respectful maternity care, provides a comprehensive approach to intrapartum management. It not only improves clinical outcomes but also enhances the overall quality of care provided to labouring women. However, further large-scale studies in diverse clinical settings are recommended to validate these findings and assess long-term outcomes.

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