Improving Maternal Outcomes Through Evidence-Based Intrapartum and Postpartum Care: A Prospective Observational Study in a Tertiary Maternity Hospital

Authors & Affiliations

Besty Varghese, RN, NP–Critical Care

Krishna Institute of Medical Sciences (Deemed to be University), Karad, India

Research Scholar, Shri Jagdishprasad Jhabarmal Tibrewala University, India

Email: bestyvarghese08@gmail.com

Abstract

Background: Maternal morbidity and mortality remain major public health challenges globally, with postpartum haemorrhage (PPH) and hypertensive disorders contributing substantially to preventable maternal deaths. Although evidence-based intrapartum and postpartum interventions are well established, inconsistent application in routine practice limits their effectiveness.

Objective: To assess the impact of evidence-based intrapartum and postpartum care practices—specifically Active Management of the Third Stage of Labour (AMTSL), Maternal Early Warning Scores (MEWS), and structured immediate postpartum monitoring—on PPH incidence and maternal and neonatal outcomes in a tertiary maternity hospital.

Methods: A prospective observational study was conducted from January to June 2024 in a 200-bed tertiary maternity hospital. A total of 1,020 mother–infant dyads were included. Data on intrapartum interventions, postpartum monitoring, maternal near-miss events, neonatal APGAR scores, and breastfeeding initiation were collected. Statistical analysis was performed using SPSS version 26. Categorical variables were analyzed using the chi-square test, with statistical significance set at $p < 0.05$.

Results: PPH incidence decreased significantly from 8.4% (baseline audit, 2023) to 4.1% during the study period ($p = 0.03$). AMTSL was significantly associated with reduced blood loss greater than 500 mL ($p = 0.02$). Maternal near-miss events declined from 14 to 7 cases. Neonatal outcomes improved, with APGAR scores ≥7 at 5 minutes increasing to 96.2% ($p = 0.04$). Early breastfeeding initiation within the first hour increased from 58% to 76% ($p = 0.01$).

Conclusion: Standardized implementation of evidence-based intrapartum and postpartum care practices significantly improves maternal safety and neonatal outcomes. These findings support the integration of structured clinical bundles and continuous staff training in maternity care settings.

Keywords: Intrapartum care; Postpartum care; Postpartum haemorrhage; Maternal outcomes; Active management of third stage of labour.

Introduction

Maternal morbidity and mortality continue to pose significant challenges worldwide, particularly in low- and middle-income countries. Postpartum haemorrhage (PPH) remains the leading cause of maternal mortality, followed closely by hypertensive disorders of pregnancy. Despite the availability of clear evidence-based guidelines from the World Health Organization (WHO) and the International Federation of Gynecology and Obstetrics (FIGO), gaps persist between recommended practices and their consistent implementation in clinical settings.

Active Management of the Third Stage of Labour (AMTSL) has been shown to reduce the risk of PPH by promoting effective uterine contraction and placental separation. Similarly, structured maternal monitoring tools such as Maternal Early Warning Scores (MEWS) enable early detection of clinical deterioration, allowing timely intervention. Immediate postpartum care—including vigilant observation, early mobilization, and breastfeeding support—plays a crucial role in optimizing maternal recovery and neonatal adaptation.

This study was conducted to evaluate the impact of systematically implementing evidence-based intrapartum and postpartum care practices on maternal and neonatal outcomes in a tertiary maternity hospital setting.

Review of Literature

1. Author: World Health Organization
Journal: WHO Guidelines on the Prevention and Treatment of Postpartum Haemorrhage
ISSN: Not applicable (WHO guideline document)
Year: 2012
Review:
The World Health Organization emphasized that postpartum haemorrhage is the leading cause of maternal mortality worldwide. The guideline strongly recommends Active Management of the Third Stage of Labour (AMTSL) for all vaginal births to reduce blood loss and prevent maternal morbidity. Evidence-based uterotonic use and systematic postpartum monitoring were highlighted as critical components of safe maternity care.

2. Author: Begley CM, Gyte GML, Devane D, McGuire W
Journal: Cochrane Database of Systematic Reviews
ISSN: 1469-493X
Year: 2019
Review:
This systematic review evaluated the effectiveness of AMTSL versus expectant management. The authors reported a significant reduction in postpartum haemorrhage and severe blood loss among women receiving AMTSL. The review concluded that routine use of prophylactic oxytocin plays a vital role in improving maternal outcomes during the third stage of labour.

3. Author: International Federation of Gynecology and Obstetrics (FIGO)
Journal: International Journal of Gynecology & Obstetrics
ISSN: 0020-7292
Year: 2018
Review:
FIGO guidelines reinforced the universal application of AMTSL as a life-saving intervention. The publication highlighted that consistent intrapartum practices, especially in tertiary and high-volume maternity units, can significantly reduce preventable maternal deaths related to haemorrhage.

4. Author: Carle C, Alexander P, Columb M, Johal J
Journal: International Journal of Obstetric Anesthesia
ISSN: 0959-289X
Year: 2013
Review:
This study assessed the role of Maternal Early Warning Scores (MEWS) in detecting early clinical deterioration. Findings demonstrated improved communication between healthcare teams and earlier escalation of care, leading to a reduction in maternal near-miss events and severe morbidity.

5. Author: Knight M, Nair M, Tuffnell D, Shakespeare J
Journal: BJOG: An International Journal of Obstetrics & Gynaecology
ISSN: 1470-0328
Year: 2016
Review:
The authors examined maternal outcomes related to postpartum monitoring practices. The study found that structured observation during the immediate postpartum period significantly reduced delays in identifying haemorrhage and hypertensive disorders, improving maternal safety outcomes.

6. Author: Moore ER, Bergman N, Anderson GC, Medley N
Journal: Cochrane Database of Systematic Reviews
ISSN: 1469-493X
Year: 2016
Review:
This review highlighted the benefits of early breastfeeding initiation within the first hour of birth. Improved neonatal APGAR scores, enhanced thermoregulation, and stronger mother–infant bonding were reported, emphasizing the role of structured postpartum support.

7. Author: Main EK, McCain CL, Morton CH, Holtby S, Lawton ES
Journal: Obstetrics & Gynecology
ISSN: 1099-3630
Year: 2017
Review:
The study demonstrated that standardized obstetric care bundles significantly reduced severe maternal morbidity across multiple healthcare institutions. Continuous staff training and adherence to evidence-based intrapartum and postpartum protocols were identified as key success factors.

Summary of Review of Literature

The reviewed literature provides strong evidence that implementation of standardized intrapartum and postpartum care—particularly AMTSL, MEWS, and structured postpartum monitoring—significantly improves maternal and neonatal outcomes. These findings justify the need for systematic application of evidence-based practices, forming the foundation for the present study.

Methodology

Study Design

A prospective observational study design was adopted to evaluate the impact of evidence-based intrapartum and postpartum care practices on maternal and neonatal outcomes.

Study Setting and Duration

The study was conducted in a 200-bed tertiary maternity hospital in India over a six-month period from January to June 2024. The hospital manages approximately 4,500 deliveries annually and provides comprehensive obstetric and neonatal services.

Study Population and Sample Size

A total of 1,020 mother–infant dyads were enrolled using consecutive sampling. Inclusion criteria comprised women with singleton pregnancies delivering at ≥37 weeks of gestation through vaginal or cesarean birth.

Excluding Criteria

Mothers with known coagulation disorders, severe pre-existing medical illness, or incomplete clinical records were excluded.

Study Interventions

Standardized evidence-based intrapartum and postpartum care practices were implemented uniformly, including:

- **Active Management of the Third Stage of Labour (AMTSL):** Administration of oxytocin 10 IU intramuscularly following delivery, controlled cord traction, and uterine massage after placental expulsion.
- **Maternal Early Warning Score (MEWS):** Hourly monitoring of vital signs and clinical parameters during the immediate postpartum period to enable early identification of maternal deterioration.
- **Immediate Postpartum Care:** Close observation for haemorrhage and hypertensive complications, support for early breastfeeding initiation within the first hour of birth, and patient education on postpartum warning signs.

Data Collection Tools and Procedure

Data were collected using structured observation checklists and standardized record review forms. Variables included maternal demographic characteristics, obstetric details, intrapartum interventions, estimated blood loss, incidence of postpartum haemorrhage, maternal near-miss events, neonatal APGAR scores at 1 and 5 minutes, and timing of breastfeeding initiation.

Outcome Measures

Primary outcome measures included the incidence of postpartum haemorrhage and occurrence of maternal near-miss events. Secondary outcomes included neonatal APGAR scores at 5 minutes and early initiation of breastfeeding.

Statistical Analysis

Data were entered and analyzed using SPSS version 26. Descriptive statistics were used to summarize baseline characteristics. Categorical variables were compared using the chi-square test. A p-value of less than 0.05 was considered statistically significant.

Results

Table 1. Maternal Outcomes Before and After Implementation of Evidence-Based Care Practices

Outcome	Baseline Audit (2023)	Study Period (2024)	p-value
PPH incidence	8.4%	4.1%	0.03
Blood loss >500 mL	Higher	Significantly reduced	0.02
Maternal near-miss events	14 cases	7 cases	–

Table 2. Neonatal Outcomes

Outcome	Baseline	Study Period	p-value
APGAR ≥7 at 5 min	92.8%	96.2%	0.04
Breastfeeding initiation ≤1 hour	58%	76%	0.01

Figure 1. Trend in Postpartum Haemorrhage Incidence

A comparative analysis demonstrates a marked reduction in PPH incidence following implementation of standardized intrapartum and postpartum care practices.

Figure 2. Improvement in Neonatal APGAR Scores at 5 Minutes

An upward trend in APGAR scores ≥7 at 5 minutes was observed during the study period compared to baseline data.

Maternal Outcomes

The incidence of postpartum haemorrhage reduced significantly from 8.4% in the 2023 baseline audit to 4.1% during the study period ($p = 0.03$). AMTSL implementation was significantly associated with reduced blood loss greater than 500 mL ($p = 0.02$). Maternal near-miss events related to haemorrhage and hypertensive disorders decreased from 14 cases in the previous year to 7 cases during the study period.

Neonatal Outcomes

Neonatal outcomes improved, with APGAR scores ≥7 at 5 minutes observed in 96.2% of newborns compared to 92.8% prior to implementation ($p = 0.04$). Early initiation of breastfeeding within the first hour increased from 58% to 76% following strengthened postpartum support ($p = 0.01$).

Statistical Analysis Justification

Statistical analysis was conducted using SPSS version 26 to ensure robust and reproducible results. Descriptive statistics were used to summarize demographic and clinical characteristics. The chi-square test was selected to compare categorical variables such as PPH incidence, APGAR score categories, and breastfeeding initiation rates before and after implementation of evidence-based practices. This test was appropriate given the categorical nature of the outcome variables and the adequate sample size. A p-value of less than 0.05 was considered statistically significant, aligning with conventional biomedical research standards.

Discussion

The findings demonstrate that structured implementation of evidence-based intrapartum and postpartum care practices significantly improves maternal and neonatal outcomes. The reduction in PPH aligns with WHO and FIGO recommendations advocating universal AMTSL. Improved neonatal APGAR scores and early breastfeeding rates highlight the importance of immediate postpartum support.

The decrease in maternal near-miss events underscores the value of MEWS in early recognition and management of clinical deterioration. These results reinforce the role of standardized care bundles, staff training, and continuous monitoring in enhancing patient safety and quality of care.

Limitations

This study was conducted in a single tertiary care center, which may limit generalizability to other healthcare settings. As an observational study, causal relationships cannot be definitively established. Additionally, long-term maternal and neonatal outcomes beyond the immediate postpartum period were not evaluated.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee of Krishna Institute of Medical Sciences (Deemed to be University), Karad. Written informed consent was obtained from all participating mothers prior to inclusion in the study. Confidentiality of patient information was maintained throughout the study, and data were used exclusively for research purposes.

Data Availability Statement

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable request, subject to institutional and ethical approvals.

Conclusion

Consistent application of evidence-based intrapartum and postpartum care—including AMTSL, structured maternal monitoring, and immediate postpartum support—significantly reduces PPH and improves maternal and neonatal outcomes. Adoption of standardized clinical protocols and continuous professional training can serve as scalable strategies for improving maternity care quality across diverse healthcare settings.

Recommendations

- Scale-up standardized intrapartum and postpartum care bundles across maternity units
- Regular training and competency assessment of maternity care staff
- Multi-center studies with long-term postpartum follow-up

References

1. World Health Organization. WHO recommendations for the prevention and treatment of postpartum haemorrhage. Geneva: WHO; 2012.
2. International Federation of Gynecology and Obstetrics (FIGO). Guidelines on active management of the third stage of labour. Int J Gynaecol Obstet. 2018.
3. Government of India. Confidential enquiries into maternal deaths in India. New Delhi: Ministry of Health and Family Welfare.
4. Say L, Chou D, Gemmill A, et al. Global causes of maternal death: a WHO systematic analysis. Lancet Glob Health. 2014;2(6):e323–e333.