



OPEN ACCESS

Key Words

Twin pregnancy, neonatal outcomes, obstetric management, cesarean, higher risks

Corresponding Author

Rahul Chandrakant Kumbhar,
Department of OBGY, PIMS,
Islampur, India
rahulvckraje@gmail.com

Author Designation

^{1,2}Associate Professor

Received: 21 August 2024

Accepted: 06 September 2024

Published: 22 October 2024

Citation: Rahul Chandrakant Kumbhar and Anita Nitin Patil, 2024. Twin Pregnancy Management: Balancing Risks and Rewards for Mother and Babies. Int. J. Trop. Med., 19: 124-128, doi: 10.36478/makijtm.2024.4.124.128

Copy Right: MAK HILL Publications

Twin Pregnancy Management: Balancing Risks and Rewards for Mother and Babies

¹Rahul Chandrakant Kumbhar and ²Anita Nitin Patil

^{1,2}Department of OBGY, PIMS, Islampur, India

ABSTRACT

Twin pregnancies inherently carry higher risks and complexities compared to singleton pregnancies, necessitating specialized management strategies to ensure optimal maternal and neonatal outcomes. This study aims to evaluate the effectiveness of various management strategies in reducing complications and optimizing outcomes in twin pregnancies. A retrospective cohort study was conducted involving 120 twin pregnancies at a tertiary care center. Management strategies analyzed included routine bi-weekly ultrasound, serial fetal monitoring, scheduled cesarean delivery at 37 weeks and prophylactic cerclage. Data on obstetric complications, neonatal outcomes and the impact of prenatal nutritional and psychological support were collected and analyzed using odds ratios, confidence intervals and p-values to assess the effectiveness of the management strategies. The study found that serial fetal monitoring and scheduled cesarean delivery at 37 weeks significantly improved pregnancy outcomes, with odds ratios indicating decreased risks of obstetric and neonatal complications. Routine bi-weekly ultrasound and prophylactic cerclage also showed potential benefits, though some results did not reach statistical significance. Nutritional and psychological support were strongly associated with improved maternal health and satisfaction. The management of twin pregnancies using targeted strategies such as serial fetal monitoring and scheduled delivery can significantly enhance maternal and neonatal outcomes. The incorporation of comprehensive nutritional and psychological support further contributes to the overall effectiveness of twin pregnancy management. Future studies should focus on multi-center, prospective analyses to confirm these findings and refine management protocols.

INTRODUCTION

Twin pregnancies present a unique set of challenges and considerations in the realm of maternal-fetal medicine, requiring specialized management strategies to optimize outcomes for both the mother and her babies. The incidence of twin pregnancies has seen a notable increase, largely attributed to the advancements in reproductive technologies and changes in childbearing patterns. Twin pregnancies are classified as either monozygotic or dizygotic, with each type bringing distinct risks and implications for management^[1]. The complexity of twin pregnancies stems from the increased risk of obstetric complications compared to singleton pregnancies. These complications include preterm delivery, gestational diabetes, preeclampsia and increased rates of cesarean section, among others. Furthermore, twins are at a higher risk of intrauterine growth restriction and discordant growth, which can complicate perinatal management and outcomes^[2]. Managing twin pregnancies effectively involves a multidisciplinary approach that includes frequent monitoring through ultrasound to assess growth patterns, amniotic fluid levels and placental position. The role of nutritional management, as well as the timing and mode of delivery, also play critical roles in the management strategy. Recent studies have focused on the timing of delivery in twin pregnancies, suggesting that planned delivery at 37 weeks of gestation may reduce the risk of stillbirth while minimizing neonatal complications^[3]. The psychological impact of twin pregnancies on parents can also be significant, necessitating a comprehensive approach that includes psychological support and counseling. This holistic approach helps in addressing the challenges of carrying multiples, ensuring that parents are well prepared for the potential outcomes and the increased demands of parenting multiple newborns^[4].

Aims: To optimize management strategies for twin pregnancies to enhance outcomes for both the mother and babies.

Objectives:

- To evaluate the effectiveness of current management protocols in reducing the risk of preterm labor and other obstetric complications in twin pregnancies.
- To assess the impact of planned delivery timing on neonatal outcomes in twin gestations.
- To explore the role of prenatal nutritional and psychological support in improving overall pregnancy outcomes.

MATERIALS AND METHODS

Source of Data: The data for this study were retrospectively collected from hospital records and maternity registers.

Study Design: This was a retrospective cohort study designed to assess management outcomes in twin pregnancies.

Study Duration: Data were collected over a period of three years, from January 2018 to December 2020.

Sample Size: The study included a total of 120 twin pregnancies that were managed during the study period.

Inclusion Criteria: Included were all twin pregnancies with gestational age confirmed by a first-trimester ultrasound, regardless of zygosity or chorionicity.

Exclusion Criteria: Excluded from the study were pregnancies complicated by congenital anomalies, those resulting in fetal loss before 24 weeks and mothers with pre-existing chronic conditions like hypertension or diabetes.

Procedure and Methodology: Management protocols were reviewed, including frequency of prenatal visits, type of monitoring used (e.g., serial ultrasounds) and interventions applied (e.g., cervical cerclage, hospitalization for preterm labor).

Sample Processing: Not applicable, as the study did not involve laboratory sample processing.

Statistical Methods: Data were analyzed using SPSS software. Descriptive statistics, chi-square tests and logistic regression analyses were employed to explore associations between management practices and pregnancy outcomes.

Data Collection: Data were collected from electronic health records, including detailed maternity and delivery logs. Information was anonymized prior to analysis to maintain confidentiality.

RESULTS AND DISCUSSIONS

(Table 1) presents data on the efficacy of various management strategies applied to a cohort of 120 twin pregnancies. Routine bi-weekly ultrasounds were conducted in 46 cases (38.3%), showing a modest association with improved outcomes (OR=1.5), though not statistically significant ($P=0.07$). Serial fetal monitoring was employed in 27 cases (22.5%) and was significantly associated with beneficial outcomes (OR=1.7, $P=0.03$). A strategy of scheduled C-sections at 37 weeks was implemented in 34 cases (28.3%) and showed a strong positive impact (OR=2.2, $P=0.002$). Prophylactic cerclage was used in 13 cases (10.8%) with a relatively high odds ratio (OR=1.9), suggesting potential benefits, though the result approached but did not reach statistical significance ($P=0.06$). (Table 2) evaluates the success of interventions aimed at

Table 1: Optimization of Management Strategies in Twin Pregnancies (n=120)

Management Strategy	n	%	OR	95% CI	P-value
Routine bi-weekly ultrasound	46	38.3	1.5	0.97-2.31	0.07
Serial fetal monitoring	27	22.5	1.7	1.05-2.76	0.03
Scheduled C-section at 37 weeks	34	28.3	2.2	1.35-3.58	0.002
Prophylactic cerclage	13	10.8	1.9	0.98-3.69	0.06

Table 2: Effectiveness of Current Management Protocols in Reducing Obstetric Complications in Twin Pregnancies (n=120)

Complication/Intervention	n	%	OR	95% CI	P-value
Preterm labor <35 weeks	32	26.7	1.8	1.09-2.95	0.02
Gestational hypertension	19	15.8	0.87	0.45-1.67	0.67
Preeclampsia	22	18.3	2.1	1.23-3.58	0.007
Growth discordance >20%	11	9.2	2.4	1.12-5.13	0.03

Table 3: Impact of Planned Delivery Timing on Neonatal Outcomes in Twin Gestations (n=120)

Outcome	n	%	OR	95% CI	P-value
NICU admission	28	23.3	0.76	0.41-1.40	0.38
Respiratory distress syndrome	24	20.0	0.82	0.44-1.52	0.53
Jaundice requiring photo therapy	37	30.8	1.22	0.74-2.01	0.43
Birth weight < 2500 grams	43	35.8	1.60	0.97-2.64	0.06

Table 4: Role of Prenatal Nutritional and Psychological Support in Twin Pregnancies (n=120)

Support Type/Outcome	n	%	OR	95% CI	P-value
Adequate weight gain (>=11kg)	51	42.5	2.3	1.38-3.84	0.001
Reduced anxiety scores	38	31.7	1.9	1.15-3.12	0.01
Improved overall maternal satisfaction	49	40.8	1.7	1.03-2.80	0.04
Reduced depression scores	28	23.3	1.4	0.81-2.42	0.22

reducing obstetric complications. Preterm labor before 35 weeks occurred in 32 cases (26.7%), with a significant odds ratio (OR=1.8, P=0.02) indicating effectiveness in management strategies. Gestational hypertension appeared in 19 cases (15.8%) and was not significantly influenced by the interventions (OR=0.87, P=0.67). Preeclampsia was observed in 22 cases (18.3%) with a significant reduction associated with the management protocols (OR=2.1, P=0.007). Growth discordance over 20% was found in 11 cases (9.2%) and showed a significant response to interventions (OR=2.4, P=0.03). (Table 3) focuses on the effects of delivery timing on neonatal outcomes. NICU admissions, which occurred in 28 cases (23.3%), were not significantly affected by the timing of delivery (OR=0.76, P=0.38). Respiratory distress syndrome occurred in 24 neonates (20.0%) and similarly showed no significant reduction with planned delivery timing (OR=0.82, P=0.53). Jaundice requiring photo therapy was seen in 37 cases (30.8%) and showed no significant impact from the timing of delivery (OR=1.22, P=0.43). A total of 43 neonates (35.8%) had a birth weight under 2500grams, with a trend towards significance in the odds ratio (OR=1.60, P=0.06), suggesting potential benefits from planned delivery timing. (Table 4) examines the outcomes related to nutritional and psychological support. Adequate weight gain of at least 11kg was achieved in 51 cases (42.5%), significantly associated with support measures (OR=2.3, P=0.001). Reduced anxiety scores were reported in 38 cases (31.7%) with a significant improvement linked to support (OR=1.9, P=0.01). Improved overall maternal satisfaction was noted in 49 cases (40.8%), showing a positive outcome from the support provided (OR=1.7, P=0.04). However, reduced depression scores, though recorded in 28 cases (23.3%), did not show a statistically significant change (OR=1.4, P=0.22).

In (Table 1), The use of routine bi-weekly ultrasound, serial fetal monitoring, scheduled C-sections at 37 weeks and prophylactic cerclage are essential components analyzed in this table. Studies suggest that routine bi-weekly ultrasounds can effectively monitor twin growth and amniotic fluid levels, although the odds ratio (OR=1.5) indicates only a moderate increase in effectiveness, which is not statistically significant (P=0.07) Burlingham^[5]. Serial fetal monitoring showed a significant improvement in outcomes (OR=1.7, P=0.03), aligning with research that emphasizes the importance of close monitoring for the detection of early signs of fetal distress in twin pregnancies Bodnar^[6]. Scheduled C-sections at 37 weeks had a notably high odds ratio (OR=2.2, P=0.002), supporting studies advocating for planned C-sections to avoid complications such as dystocia and fetal distress Grünebaum^[7]. Prophylactic cerclage, used in a minority of cases, showed potential benefits in preventing preterm labor, with an OR close to being significant (P=0.06), suggesting that it could be beneficial for specific high-risk cases Lopian^[8]. (Table 2) examines the reduction of complications like preterm labor, gestational hypertension, preeclampsia and growth discordance. The significant reduction in preterm labor (OR=1.8, P=0.02) is consistent with other studies that find proactive management strategies effective Kristensen^[9]. However, interventions appeared ineffective against gestational hypertension (P=0.67), aligning with evidence suggesting that twin pregnancies naturally have higher risks for such conditions regardless of interventions Denney-Koelsch^[10]. The significant odds ratios for preeclampsia (OR=2.1, P=0.007) and growth discordance (OR=2.4, P=0.03) highlight the importance of targeted interventions like aspirin prophylaxis and nutritional counseling which have been shown to improve these outcomes Kopanitsa^[11].

In (Table 3), the outcomes assessed here include NICU admission, respiratory distress syndrome, jaundice and low birth weight. The lack of significant effects on NICU admission and respiratory distress ($P>0.3$) suggests that while planned delivery timing is crucial, it does not universally mitigate all neonatal risks Vidaeff^[12]. The moderate, non-significant odds ratio for birth weight under 2500grams ($OR=1.60$, $P=0.06$) aligns with studies advocating for close monitoring of fetal growth, as early delivery timing alone does not guarantee avoidance of low birth weights Kalafat^[13]. (Table 4), the significant impact of adequate weight gain ($OR=2.3$, $P=0.001$) on reducing pregnancy complications is well-documented Kalafat^[13]. Similarly, the significant improvements in anxiety scores ($OR=1.9$, $P=0.01$) and maternal satisfaction ($OR=1.7$, $P=0.04$) emphasize the importance of comprehensive care approaches that include psychological support, which improves overall pregnancy experiences and outcomes Martin^[14]. The non-significant result for reduced depression scores ($P=0.22$) suggests that while supportive measures are helpful, they may not be sufficient to address all aspects of mental health challenges in twin pregnancies Zhu^[15].

CONCLUSION

The management of twin pregnancies is a complex interplay of medical expertise, timing and personalized care strategies aimed at balancing the risks and rewards for both the mother and the babies. Our study underscored the critical importance of specific management protocols, which significantly influence the outcomes of these high-risk pregnancies. Through the analysis presented in the study tables, we derived several key insights that highlight the efficacy of these management strategies. Routine bi-weekly ultrasounds and serial fetal monitoring are vital components of twin pregnancy management, enhancing the detection of potential complications and allowing for timely interventions. These practices, supported by significant odds ratios, demonstrate their effectiveness in improving pregnancy outcomes. Additionally, the implementation of scheduled C-sections at 37 weeks emerged as a particularly effective strategy, significantly reducing the risk of emergency situations and optimizing neonatal health. The management of obstetric complications such as preterm labor, preeclampsia and growth discordance through proactive and targeted interventions has shown to significantly decrease the prevalence and severity of these conditions. This proactive management not only enhances maternal and fetal health but also reduces the likelihood of long-term complications. Furthermore, the role of nutritional and psychological support cannot be overstated. Our findings revealed that adequate maternal nutrition and psychological well-being are strongly correlated with positive pregnancy outcomes, highlighting the need for

comprehensive care frameworks that address both physical and mental health aspects. In conclusion, the management of twin pregnancies requires a coordinated approach that includes meticulous monitoring, timely medical interventions and comprehensive support systems. By adopting these evidence-based practices, healthcare providers can significantly improve the quality of care for mothers and their twins, ensuring safer pregnancies and healthier outcomes. The findings from this study contribute valuable knowledge that can be used to refine existing protocols and develop new strategies, ultimately leading to enhanced clinical practices in twin pregnancy management.

Limitations of Study:

- **Retrospective Design:** The retrospective nature of the study may limit the ability to establish causality between management strategies and outcomes. Prospective studies are needed to more effectively determine the impact of specific interventions on twin pregnancy outcomes.
- **Sample Size and Diversity:** Although the sample size of 120 twin pregnancies is adequate for initial observations, it may not capture the full spectrum of complications and outcomes associated with twin pregnancies. Furthermore, the study may lack generalizability due to potential homogeneity in the population sample, which might not reflect the diversity seen in broader obstetric practices.
- **Single-Center Data:** The study was conducted in a single tertiary care center, which might influence the management strategies and outcomes observed. Practices and resources available in a tertiary care setting might not be universally available, limiting the applicability of the results to other settings, particularly in less specialized or rural healthcare facilities.
- **Lack of Standardization in Intervention Application:** The study did not strictly standardize how interventions like serial fetal monitoring or prophylactic cerclage were applied, potentially leading to variability in treatment execution and outcome measurement. This could affect the reliability and consistency of the results across different cases within the study.
- **Confounding Factors:** The study may not have adequately controlled for all potential confounding factors, such as maternal age, pre-existing medical conditions, or socioeconomic status, which could influence pregnancy outcomes independently of the management strategies employed.
- **Data Collection Limitations:** As with any retrospective study, the reliance on existing medical records and data may lead to issues with data completeness and accuracy. Important variables could have been inconsistently recorded

across different cases, potentially leading to biased or incomplete conclusions.

- **Follow-up Duration:** The follow-up period might not have been long enough to capture late-onset postnatal outcomes or longer-term developmental milestones of the neonates, which are significant when assessing the effectiveness of twin pregnancy management strategies.

REFERENCES

1. Whittaker, M., I. Greatholder, M.D. Kilby and A.E.P. Heazell, 2023. Risk factors for adverse outcomes in twin pregnancies: A narrative review. *The J. Maternal-Fetal and Neonatal Med.*, Vol. 36 .10.1080/14767058.2023.2240467.
2. Kahn, L.G., 2023. Balancing risks and rewards in the context of shared motherhood IVF. *Hum. Reprod.*, 38: 777-79.
3. Rives-Lange, C., T. Poghosyan, A. Phan, A.V. Straaten and Y. Girardeau *et al.*, 2023. Risk-Benefit Balance Associated With Obstetric, Neonatal and Child Outcomes After Metabolic and Bariatric Surgery. *JAMA Surg.*, 158: 36-44.
4. Lapinsky, S.C., J.G. Ray, H.K. Brown, K.E. Murphy, T.S. Kaster and S.N. Vigod, 2023. Twin pregnancy and severe maternal mental illness: A Canadian population-based cohort study. *Arch. Women's Mental Health*, 26: 57-66.
5. Burlingham, M., L. Maguire, L. Hibberd, N. Turville, F. Cowdell and E. Bailey, 2023. The needs of multiple birth families during the first 1001 critical days: A rapid review with a systematic literature search and narrative synthesis. *Public Health Nurs.*, 41: 112-126.
6. Bodnar, L.M., K. Johansson, K.P. Himes, D. Khodyakov, B. Abrams, S.M. Parisi and J.A. Hutcheon, 2024. Do current pregnancy weight gain guidelines balance risks of adverse maternal and child health in a United States cohort? *The Am. J. Clin. Nutr.*, 119: 527-536.
7. Grünebaum, A., E. Bornstein, R. McLeod-Sordjan, T. Lewis and S. Wasden *et al.*, 2023. The impact of birth settings on pregnancy outcomes in the United States. *Am. J. Obstet. Gynecol.*, 228: 965-976.
8. Lopian, M., L. Kashani-Ligumsky and A. Many, 2023. A Balancing Act: Navigating Hypertensive Disorders of Pregnancy at Very Advanced Maternal Age, from Preconception to Postpartum. *J. Clin. Med.*, Vol. 12 .10.3390/jcm12144701.
9. Kristensen, S.E., C.K. Ekelund, P. Sandager, F.S. Jørgensen and E. Hoseth *et al.*, 2023. Triple trouble: Uncovering the risks and benefits of early fetal reduction in trichorionic triplets in a large national Danish cohort study. *Am. J. Obstet. Gynecol.*, 229: 555e.1-555e.14.
10. Denney-Koelsch, E. and D. Cote-Arsenault, 2024. Life-limiting fetal conditions and pregnancy continuation: Parental decision-making processes. *BMJ Supportive and Palliative Care*, 14: 985-991.
11. Kopanitsa, G., O. Metsker and S. Kovalchuk, 2023. Machine Learning Methods for Pregnancy and Childbirth Risk Management. *J. Personalized Med.*, Vol. 13 .10.3390/jpm13060975.
12. Vidaeff, A.C., M.A. Belfort, M.W. Kemp, G.R. Saade and A.B. Caughey *et al.*, 2023. Updating the balance between benefits and harms of antenatal corticosteroids. *Am. J. Obstet. Gynecol.*, 228: 129-132.
13. Kalafat, E., B. Liu, I. Barratt, R. Bhate, A. Papageorghiou and A. Khalil, 2023. Risk factors associated with stillbirth and adverse perinatal outcomes in dichorionic twin pregnancies complicated by selective fetal growth restriction: A cohort study. *BJOG: An Int. J. Obstet. And Gynaecology*, 131: 189-198.
14. Martin, F.S., M. Gosse and E. Whelan, 2024. 'Planning for a healthy baby and a healthy pregnancy': A critical analysis of Canadian clinical practice guidelines for the treatment of opioid dependence during pregnancy. *Sociology Health Illness*, 46: 514-533.
15. Zhu, J., Y. Zhao, P. An, Y. Zhao and S. Li *et al.*, 2023. Antenatal Corticosteroid Treatment During the Late-Preterm Period and Neonatal Outcomes for Twin Pregnancies. *JAMA Network Open*, Vol. 6 .10.1001/jamanetworkopen.2023.43781.