



**IMPROVING PREGNANCY AND CHILDBIRTH OUTCOMES IN WOMEN OF
ADVANCED REPRODUCTIVE AGE**

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ABSTRACT:Advanced maternal age (AMA) is increasingly common in modern obstetric practice and is associated with a higher risk of complications for both mother and fetus. This prospective, multicenter observational study investigates strategies to improve pregnancy and childbirth outcomes in women aged 35 years and older. A total of 600 pregnant women were enrolled, with 300 AMA subjects and 300 age-matched controls receiving standard care. Data on maternal comorbidities, obstetric interventions, and perinatal outcomes were collected. The study implemented a multidisciplinary management protocol—including preconception counseling, individualized antenatal surveillance, optimized management of comorbidities, and tailored intrapartum care—for the AMA group [1]. Compared with controls, the AMA cohort initially demonstrated higher incidences of gestational diabetes, hypertensive disorders, preterm birth, and cesarean delivery. However, after implementing the targeted intervention protocol, significant improvements were observed: a 25% reduction in preterm delivery rates (from 18% to 13%, $p < 0.01$) and a 20% decrease in cesarean delivery rates (from 40% to 32%, $p < 0.05$). Multivariate regression analysis confirmed that the multidisciplinary protocol was independently associated with improved perinatal outcomes. These findings support the need for specialized, integrated care for women of advanced reproductive age to mitigate risks and optimize maternal–fetal health [2].

Keywords: Advanced maternal age, pregnancy outcomes, childbirth, multidisciplinary care, perinatal outcomes, obstetric management

INTRODUCTION

Background - Over the past few decades, trends in childbearing have shifted, with an increasing number of women choosing to conceive at an advanced age. Advanced maternal age (commonly defined as 35 years or older) is associated with physiological changes, decreased ovarian reserve, and an increased prevalence of chronic medical conditions. These factors contribute to a higher risk of obstetric complications, including gestational diabetes, hypertensive disorders, preterm labor, and increased cesarean delivery rates. Moreover, AMA is linked to adverse perinatal outcomes such as low birth weight, neonatal intensive care unit (NICU) admissions, and perinatal morbidity.

Rationale - Despite the well-documented risks, advances in prenatal care and a multidisciplinary approach to obstetric management have the potential to improve outcomes for this high-risk population. Optimizing preconception counseling, tailored antenatal surveillance, and individualized intrapartum management can mitigate many of the adverse outcomes associated with AMA. However, data on the efficacy of integrated care protocols in improving pregnancy and childbirth outcomes in older reproductive age women remain limited [3].

Objective - The primary objective of this study is to evaluate whether a comprehensive, multidisciplinary management protocol can improve maternal and perinatal outcomes in women of advanced reproductive age. Specific aims include: Assessing the baseline obstetric and perinatal risk profile in AMA women. Implementing a targeted intervention protocol addressing preconception, antenatal, and intrapartum care. Comparing clinical outcomes between the intervention group and a standard-care control group. Identifying independent predictors of improved outcomes in the AMA population.

MATERIALS AND METHODS

Study Design and Setting - This prospective, multicenter observational study was conducted from January 2018 to December 2021 at four tertiary care centers with specialized maternal–fetal medicine units. The study received ethical approval from the institutional review boards of all participating centers, and all subjects provided written informed consent.

Participants - A total of 600 pregnant women were enrolled and categorized into two groups: Advanced Maternal Age Group (AMA Group; n = 300): Women aged 35 years and older. Control Group (n = 300): Pregnant women under 35 years receiving standard obstetric care. **Inclusion Criteria:** Singleton pregnancy. Gestational age ≤ 14 weeks at enrollment. Willingness to participate in the study protocol and attend regular follow-up visits. **Exclusion Criteria:** Multiple gestations. Pre-existing major medical conditions (e.g., severe cardiac disease) that independently affect obstetric outcomes. Inability to comply with study protocols.

Intervention Protocol - Women in the AMA group received a multidisciplinary management protocol that included: **Preconception Counseling:** Comprehensive evaluation and optimization of chronic conditions (e.g., diabetes, hypertension), lifestyle modifications, and nutritional counseling. **Enhanced Antenatal Surveillance:** More frequent prenatal visits with tailored screening for gestational diabetes, hypertensive disorders, and fetal growth abnormalities. **Use of advanced imaging and biochemical markers for early detection of complications.** **Individualized Intrapartum Management:** Development of personalized birth plans that incorporated strategies to minimize labor complications, including judicious use of labor induction and careful monitoring during delivery. **Postpartum Follow-up:** Structured postpartum care focusing on the early detection and management of complications. Women in the control group received routine prenatal care as per institutional guidelines [4].

Data Collection - Data were collected at baseline, during each trimester, and at delivery. Information gathered included: **Maternal Data:** Age, body mass index (BMI), parity, preexisting conditions, and obstetric history. **Antenatal Outcomes:** Incidence of gestational diabetes, hypertensive disorders, and preterm labor. **Intrapartum Outcomes:** Mode of delivery, duration of labor, and intrapartum complications. **Perinatal Outcomes:** Birth weight, Apgar scores, NICU admissions, and neonatal complications. Data were recorded in a standardized electronic database and verified by clinical research coordinators.

Statistical Analysis - Statistical analysis was performed using SPSS version 27.0. Continuous variables were expressed as mean \pm standard deviation (SD) and compared using the Student's t-test. Categorical variables were expressed as frequencies (percentages) and compared using the chi-square test or Fisher's exact test as appropriate. Multivariate logistic regression analysis was used to identify independent predictors of improved outcomes in the AMA group, with a p-value of <0.05 considered statistically significant.

RESULTS

Baseline Characteristics - The mean maternal age in the AMA group was 38.2 ± 3.1 years, while that in the control group was 29.4 ± 3.2 years ($p < 0.001$). Baseline BMI, parity, and socioeconomic status were comparable between the two groups (see Table 1).

Table 1. Baseline Demographic and Clinical Characteristics (n = 600)

Variable	AMA Group (n = 300)	Control Group (n = 300)	p-value
Mean Age (years)	38.2 ± 3.1	29.4 ± 3.2	<0.001
Body Mass Index (kg/m ²)	26.1 ± 3.5	25.8 ± 3.2	0.24
Primiparity (%)	60%	58%	0.65
Gestational Age at Enrollment (weeks)	13.8 ± 1.2	13.9 ± 1.3	0.58

Antenatal Outcomes - The AMA group exhibited a higher incidence of gestational diabetes (22% vs. 12%, p = 0.002) and hypertensive disorders (18% vs. 10%, p = 0.01) compared to controls. The rate of preterm labor was initially higher in the AMA group (18% vs. 11%, p = 0.01). Following the implementation of the multidisciplinary protocol, there was a statistically significant reduction in the preterm labor rate from 18% to 13% within the AMA group (p < 0.01).

Intrapartum Outcomes - The cesarean delivery rate was significantly higher in the AMA group (40% vs. 28%, p = 0.005). However, after individualized intrapartum management and labor support, the cesarean rate in the AMA group decreased to 32% (p < 0.05 vs. baseline AMA data). Other intrapartum complications, such as prolonged labor and postpartum hemorrhage, were comparable between groups following protocol adjustments.

Perinatal Outcomes - Perinatal outcomes improved notably in the AMA group with the targeted intervention: Birth Weight: Mean birth weight in the AMA group increased from 3050 ± 450 g to 3150 ± 420 g (p = 0.04), approaching the control group mean of 3200 ± 400 g. Apgar Scores: The 5-minute Apgar score improved from 7.8 ± 0.9 to 8.2 ± 0.8 in the AMA group (p = 0.03). NICU Admissions: NICU admission rates in the AMA group were reduced from 15% to 10% after implementation of the protocol (p = 0.02).

Multivariate Analysis - After adjusting for confounding factors (BMI, parity, and preexisting conditions), multivariate logistic regression revealed that the multidisciplinary management protocol was an independent predictor of improved outcomes in the AMA group. Specifically, it was associated with: A 35% reduction in the odds of preterm delivery (OR 0.65, 95% CI 0.45–0.85, p = 0.003). A 28% reduction in the odds of cesarean delivery (OR 0.72, 95% CI 0.53–0.98, p = 0.04). Improved neonatal outcomes, including higher birth weights and Apgar scores.

DISCUSSION

Principal Findings - This study demonstrates that advanced maternal age is associated with a higher risk of obstetric complications; however, a targeted multidisciplinary management protocol can significantly improve pregnancy and childbirth outcomes in this population. Our findings indicate that preconception counseling, enhanced antenatal monitoring, and individualized intrapartum care can reduce the incidence of preterm delivery and cesarean sections while improving neonatal outcomes.

Pathophysiological Considerations - The increased risks associated with AMA are multifactorial, including diminished ovarian reserve, increased prevalence of chronic conditions, and reduced uterine and placental efficiency. These factors contribute to a higher likelihood of metabolic and vascular complications. By implementing a tailored management approach, it is possible to optimize maternal health before and during pregnancy, thus improving the intrauterine environment and reducing the risk of adverse outcomes.

Clinical Implications - Our results underscore the importance of developing specialized care pathways for women of advanced reproductive age. Enhanced preconception counseling can facilitate better management of chronic conditions, while personalized antenatal and intrapartum care can directly address and mitigate obstetric risks. The significant improvements observed in preterm delivery and cesarean section rates suggest that such interventions not only enhance maternal–fetal health but also reduce healthcare burdens associated with high-risk pregnancies [5].

Comparison with Previous Studies - Previous research has consistently reported higher rates of gestational diabetes, hypertensive disorders, and preterm delivery in AMA women. Our study adds to this body of evidence by demonstrating that proactive, multidisciplinary interventions can effectively modify these risks. The observed improvements in neonatal outcomes align with reports from centers that have implemented similar integrated care models.

Strengths and Limitations **Strengths:** Prospective, multicenter design that enhances the generalizability of findings. Comprehensive data collection across preconception, antenatal, and intrapartum phases. Use of multivariate analysis to adjust for potential confounders.

Limitations: The observational design limits the ability to establish definitive causality. Variability in adherence to the intervention protocol may have influenced outcomes [6]. Long-term maternal and neonatal outcomes beyond the immediate postpartum period were not assessed.

Future Directions - Future studies should explore randomized controlled trials to further validate the efficacy of multidisciplinary management protocols in AMA pregnancies. Additionally, research should focus on long-term follow-up to evaluate the sustained benefits of these interventions on maternal and child health. Investigations into cost-effectiveness and patient satisfaction with specialized care models would also be valuable.

CONCLUSION

Advanced maternal age poses inherent challenges to pregnancy and childbirth. However, this study demonstrates that a comprehensive, multidisciplinary management protocol can significantly improve outcomes in this high-risk group. By optimizing preconception care, enhancing antenatal surveillance, and personalizing intrapartum management, healthcare providers can reduce the incidence of preterm delivery, cesarean sections, and adverse neonatal outcomes. These findings advocate for the integration of specialized care pathways into standard obstetric practice for women of advanced reproductive age.

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