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FETAL OUTCOMES IN ELDERLY PRIMIGRAVIDA PATIENTS PRESENTING TO A TERTIARY CARE HOSPITAL

Original Research

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ABSTRACT

Background: The global trend toward delayed childbearing has resulted in a growing number of women experiencing their first pregnancy at an advanced maternal age. Elderly primigravida, defined as women aged 35 years or older at first conception, are considered a high-risk obstetric group due to age-related physiological changes and increased susceptibility to pregnancy complications. Despite this rising prevalence, locally relevant data on fetal outcomes in elderly primigravida remain limited. Generating context-specific evidence is essential to guide antenatal counseling, risk stratification, and perinatal care in tertiary healthcare settings.

Objective: To determine the frequency and pattern of adverse fetal outcomes among elderly primigravida women presenting to a tertiary care hospital.

Methods: A descriptive study was conducted in the Department of Obstetrics and Gynecology, Saidu Group of Teaching Hospital, from 03 September 2024 to 02 March 2025. Pregnant women aged 35–45 years with a gestational age greater than 20 weeks and primigravid status were enrolled using consecutive non-probability sampling. Participants were followed until delivery. Fetal outcomes assessed included preterm birth, stillbirth, neonatal intensive care unit (NICU) admission, and low Apgar score at five minutes. Demographic and clinical data were recorded, and statistical analysis was performed using IBM SPSS version 25.

Results: A total of 221 elderly primigravida women were included. The mean maternal age was 40.04 ± 2.81 years, mean gestational age was 35.52 ± 4.65 weeks, and mean body mass index was 23.98 ± 2.64 kg/m². Most participants were aged 40 years or below (60.6%), and 54.3% delivered at or before 36 weeks of gestation. Prematurity was the most frequent fetal outcome, observed in 40.3% of cases, followed by NICU admission in 29.9%, low Apgar score in 24.9%, and stillbirth in 20.4% of pregnancies.

Conclusion: Elderly primigravida pregnancies were associated with a substantial burden of adverse fetal outcomes, with prematurity being the most common. These findings highlight the need for vigilant antenatal surveillance and optimized perinatal care to improve fetal outcomes in this growing obstetric population.

Keywords: Apgar Score, Infant, Premature, Pregnancy Outcome, Primigravida, Stillbirth, Tertiary Care Centers, Women, Aged.

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Women aged 35 years or older at first conception are at increased risk for pregnancy complications

OBJECTIVE

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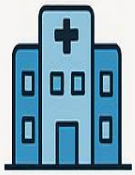
RESULTS

Sep 3, 2024 – Mar 2; 2025

METHODS



Descriptive study at a tertiary care hospital

221 elderly primigravida women

Gestational age ≥ 20 weeks

35-45 years

CONCLUSION

20.4% Prematurity

24.9% Low Apgar Score

40.3% NICU

CONCLUSION Elderly primigravida pregnancies were associated with a substantial burden of adverse fetal outcomes, with prematurity being the most common.

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INTRODUCTION

Over the past two to three decades, the proportion of women experiencing their first pregnancy at an advanced maternal age has risen steadily worldwide. Elderly primigravida—commonly defined as women aged 35 years or older at the time of delivery—represent a growing obstetric subgroup, reflecting broader social transitions such as delayed marriage, pursuit of higher education, workforce participation, and changing family structures (1). While the decision to postpone childbearing is shaped by complex social, cultural, religious, and economic factors that vary across regions, the demographic shift toward later first pregnancies has important implications for maternal and neonatal health. First childbirth is a pivotal life event that not only influences subsequent reproductive outcomes but also intersects with long-term socioeconomic status, education, and broader population dynamics, thereby extending its impact beyond individual families (2,3). From a clinical perspective, advanced maternal age in primigravida women has been repeatedly associated with an increased risk of obstetric complications. These include pregnancy-induced diabetes mellitus, hypertensive disorders of pregnancy, antepartum and postpartum hemorrhage, prolonged and obstructed labor, malpresentations and malpositions, as well as higher rates of labor induction and operative delivery (4). In parallel, biological changes accompanying advancing age—such as declining ovarian reserve, reduced oocyte quality, and cumulative ovulatory exposure—contribute to reduced fertility and a higher likelihood of chromosomal abnormalities, aneuploidy, and spontaneous pregnancy loss (5). As a result, elderly primigravidas are often considered a vulnerable obstetric population, requiring closer surveillance throughout pregnancy and childbirth due to their predisposition to adverse maternal and fetal outcomes (6).

Evidence from international and regional studies underscores the potential neonatal risks associated with elderly primigravida pregnancies. Studies reported notably higher proportions of preterm birth, low Apgar scores, neonatal intensive care unit admissions, and stillbirths among older first-time mothers, highlighting the clinical relevance of maternal age at first delivery for fetal well-being (7,8). Despite these observations, available data remain largely derived from specific populations, and findings cannot be universally generalized. In many low- and middle-income settings, particularly within local and regional demographics, there is a paucity of systematically collected evidence describing fetal outcomes among elderly primigravida women. Given the increasing frequency of elderly primigravida pregnancies in recent clinical practice and the limited context-specific data available, there is a clear need to evaluate pregnancy and fetal outcomes within the local population. The present study is therefore designed to address this gap by systematically assessing fetal outcomes among elderly primigravida women, with the objective of generating evidence that can inform clinical decision-making, risk stratification, and targeted counseling for this growing and clinically significant group of obstetric patients.

METHODS

A descriptive study design was employed to evaluate fetal outcomes among elderly primigravida women presenting to the Department of Obstetrics and Gynecology, Saidu Group of Teaching Hospital, during the study period from 03 September 2024 to 02 March 2025. Pregnant women aged 35 to 45 years with a gestational age greater than 20 weeks were included in the study. Elderly primigravida was operationally defined as a woman conceiving for the first time at the age of 35 years or above. Patients with known endocrine disorders, uterine pathologies, chronic hypertension, chronic liver disease, or chronic kidney disease were excluded to minimize confounding due to pre-existing medical conditions. The sample size was calculated as 221 using the WHO sample size calculator, assuming an expected frequency of neonatal intensive care unit (NICU) admission of 29.8%, a margin of error of 6%, and a confidence level of 95% (9). Eligible participants were recruited through consecutive non-probability sampling from the inpatient obstetrics unit. Prior to enrollment, ethical approval was obtained from the hospital's Research Review Board and the study was conducted in accordance with the principles of the Declaration of Helsinki. All participants were provided with detailed information regarding the study objectives, potential risks, and benefits, and written informed consent was obtained before inclusion. Baseline demographic and clinical data were recorded using a structured proforma. These included maternal age (years), gestational age (weeks), body mass index calculated as weight in kilograms divided by height in meters squared (kg/m²), place of residence (urban or rural), educational status, occupation, and socioeconomic status. Participants were followed prospectively until delivery in the labor room. All deliveries were managed according to standard hospital protocols for primigravida patients, and decisions regarding mode of delivery, including cesarean section or instrumental vaginal delivery, were made on clinical grounds by the attending obstetric team.

Fetal outcomes were assessed and recorded according to predefined operational definitions. Preterm birth was defined as delivery occurring before 37 completed weeks of gestation. Stillbirth was defined as the delivery of a fetus with no signs of life, while a low Apgar score was defined as an Apgar score of less than 7 at five minutes after birth (10). Admission to the neonatal intensive care unit

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was documented for newborns requiring specialized postnatal care. These outcomes constituted the primary variables of interest. Data analysis was performed using IBM SPSS Statistics version 25. Qualitative variables, including place of residence, education, occupation, socioeconomic status, and fetal outcomes (preterm birth, low Apgar score, NICU admission, and stillbirth), were summarized as frequencies and percentages. Quantitative variables such as maternal age, body mass index, and gestational age were assessed for normality using the Shapiro–Wilk test and presented as mean ± standard deviation for normally distributed data or median with interquartile range for non-normally distributed data. To control for potential effect modifiers, fetal outcomes were stratified according to maternal age groups, occupation, and place of residence. Post-stratification comparisons were performed using the chi-square test or Fisher's exact test, as appropriate, with a p-value of less than 0.05 considered statistically significant.

RESULTS

A total of 221 elderly primigravida women were included in the final analysis. The mean maternal age of the study participants was 40.04 ± 2.81 years, while the mean gestational age at delivery was 35.52 ± 4.65 weeks. The mean body mass index was 23.98 ± 2.64 kg/m², reflecting an overall normal-weight population. When categorized, the majority of women were aged 40 years or younger, accounting for 60.6% of the cohort, whereas 39.4% were older than 40 years. More than half of the participants delivered at or before 36 weeks of gestation (54.3%), and 57.9% had a body mass index of 24.0 kg/m² or below. Most women were unemployed (82.4%), and a greater proportion resided in urban areas (69.2%), indicating an urban-dominant and largely non-working study population. Adverse fetal outcomes were commonly observed among the participants. Prematurity emerged as the most frequent outcome, affecting 40.3% of pregnancies. Admission to the neonatal intensive care unit was required for 29.9% of newborns, while 24.9% were born with a low Apgar score at five minutes. Stillbirths were recorded in 20.4% of cases. Overall, a substantial proportion of pregnancies in elderly primigravida women were complicated by at least one unfavorable fetal outcome, highlighting the clinical burden associated with advanced maternal age at first pregnancy. When fetal outcomes were stratified according to maternal age, gestational age, body mass index, and place of residence, statistically significant associations were observed. Prematurity was significantly more frequent among women aged more than 40 years compared with those aged 40 years or below (48.3% vs. 35.1%, p = 0.041). Similarly, delivery at or before 36 weeks of gestation showed a strong association with adverse fetal outcomes, including higher rates of NICU admission (38.3% vs. 19.8%, p = 0.003) and low Apgar scores (32.5% vs. 15.8%, p = 0.005). Stillbirths were also significantly more common among pregnancies delivered at ≤36 weeks (26.7% vs. 12.9%, p = 0.009). Body mass index demonstrated a significant relationship with fetal outcomes. Participants with a BMI greater than 24.0 kg/m² had higher rates of prematurity (48.4% vs. 34.4%, p = 0.032) and NICU admission (37.6% vs. 24.2%, p = 0.028). No statistically significant association was observed between BMI categories and stillbirth (p = 0.118). Residence showed a modest but significant association with NICU admission, with urban residents exhibiting higher NICU admissions compared to rural residents (33.3% vs. 22.1%, p = 0.048). Occupational status did not demonstrate a statistically significant association with any of the measured fetal outcomes (p > 0.05).

Table 1: Descriptive statistics of study participants (n = 221)

Parameters	Mean	Std. Deviation
Age (years)	40.04	2.806
PoG (weeks)	35.52	4.653
BMI (kg/m2)	23.982	2.6387

Table 2: Baseline clinical and demographic characteristics of study participants (n = 221)

parameters	Subgroups	Frequency	Percent
Age (years)	40 or below	134	60.6
	More than 40	87	39.4
G age (weeks)	36 or below	120	54.3

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parameters	Subgroups	Frequency	Percent
	more than 36	101	45.7
BMI (kg/m2)	24.0 or below	128	57.9
	More than 24.0	93	42.1
Profession	Employed	39	17.6
	Unemployed	182	82.4
Residence	Rural	68	30.8
	Urban	153	69.2

Table 3: Fetal Outcomes among study participants (n = 211)

Fetal outcomes	Subgroups	Frequency	Percent
Still birth	Yes	45	20.4
	No	176	79.6
Prematurity	Yes	89	40.3
	No	132	59.7
NICU admission	Yes	66	29.9
	No	155	70.1
Low Apgar	Yes	55	24.9
	No	166	75.1

Table 4: Association of Maternal Characteristics with Adverse Fetal Outcomes (n = 221)

Variable	**Outcome**	**Category**	**n (%)**	**p-value**
Maternal Age	Prematurity	≤40 years	47 (35.1)	0.041
		>40 years	42 (48.3)	
Gestational Age	NICU Admission	≤36 weeks	46 (38.3)	0.003
		>36 weeks	20 (19.8)	
	Low Apgar	≤36 weeks	39 (32.5)	0.005
		>36 weeks	16 (15.8)	
	Stillbirth	≤36 weeks	32 (26.7)	0.009
		>36 weeks	13 (12.9)	
BMI	Prematurity	≤24.0 kg/m²	44 (34.4)	0.032
		>24.0 kg/m²	45 (48.4)	
	NICU Admission	≤24.0 kg/m²	31 (24.2)	0.028
		>24.0 kg/m²	35 (37.6)	
Residence	NICU Admission	Urban	51 (33.3)	0.048
		Rural	15 (22.1)	

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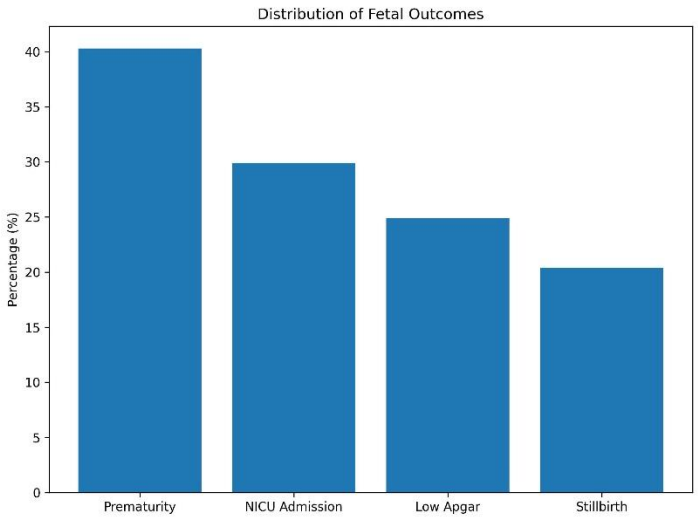

Figure 2 Distribution of Fetal Outcomes

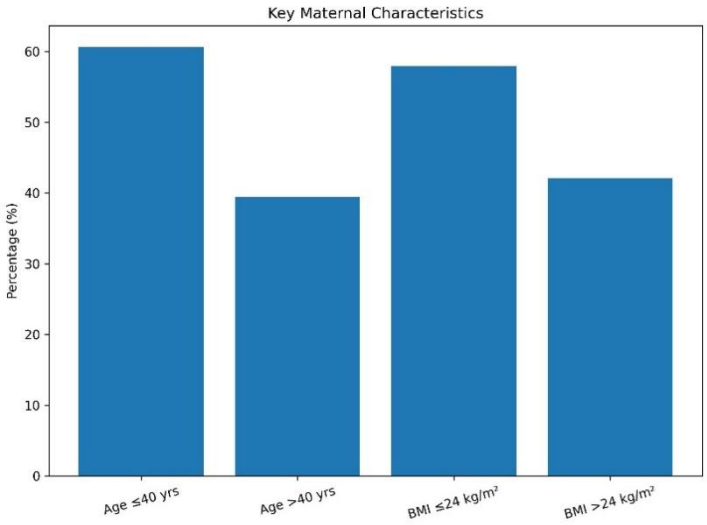

Figure 2 Key Maternal Characteristics

DISCUSSION

The increasing tendency of women to delay childbearing beyond the age of 35 has brought renewed focus to the obstetric and neonatal consequences associated with elderly primigravida. The findings of the present study support this growing concern by demonstrating a substantial burden of adverse fetal outcomes in this population. The observed rise in elderly primigravida aligns with previously reported trends, where a comparable proportion of late first pregnancies was documented, reflecting broader social changes such as delayed marriage, extended education, and evolving reproductive priorities (11). Lower reported incidence in some settings has been attributed to limited access to health facilities and higher rates of early pregnancy loss, particularly miscarriages and induced abortions before viability, which may obscure the true prevalence of elderly primigravidity (12). Sociodemographic patterns observed in this study were largely consistent with earlier reports. A predominance of unemployed or housewife participants was noted, similar to findings where the majority of elderly primigravida were not formally employed, despite varying levels of educational attainment (13). This highlights a complex interplay between education, fertility timing, and employment status, suggesting that delayed conception may occur both as a consequence of prolonged subfertility and as a deliberate choice linked to personal or socioeconomic goals. The distribution across socioeconomic strata further reinforces this shift, as elderly primigravida were no longer confined to higher socioeconomic groups. Comparable observations from previous studies demonstrated increasing representation of middle- and lower-income women, likely reflecting improved access to obstetric services and changing societal perceptions regarding late-age pregnancy (14-16).

A notable strength of the present study was the high proportion of women receiving regular antenatal care, exceeding that reported in several earlier investigations. Consistent antenatal follow-up has been associated with improved detection and timely management of pregnancy-related complications, thereby contributing to more favorable fetomaternal outcomes (17). This may partially explain the relatively low incidence of hypertensive disorders observed in the current cohort. While advanced maternal age has traditionally been linked to an increased risk of pregnancy-induced hypertension, the absence of a significant association in this study mirrors findings from other reports where no statistically significant relationship was identified, possibly due to effective antenatal surveillance and early intervention (18). Despite these strengths, preterm delivery emerged as a prominent adverse outcome in this study, occurring at a higher frequency than reported in several previous investigations, where substantially lower rates of preterm birth were observed (19). Differences in clinical protocols, referral patterns, and the categorization of elderly primigravida as high-risk pregnancies may account for this variation. Proactive hospital admission and closer monitoring of older mothers could contribute to earlier delivery decisions, particularly in the presence of subtle maternal or fetal concerns. Similarly, the proportion of neonates with low Apgar scores and NICU admissions in this study exceeded those reported in some earlier literature, although other studies have documented comparable or higher rates, underscoring the heterogeneity of outcomes across populations (20,21). The absence of perinatal mortality in the present cohort,

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despite these adverse indicators, suggests that prompt neonatal resuscitation and availability of specialized care may have mitigated fatal outcomes.

The study's strengths included a well-defined population, standardized operational definitions, and comprehensive assessment of fetal outcomes within a single tertiary care setting. However, several limitations warrant consideration. The descriptive design limited causal inference, and the absence of multivariable regression analysis restricted adjustment for potential confounders. Additionally, the single-center nature of the study may limit generalizability to other settings with differing healthcare resources. Future research employing multicenter designs and analytical approaches with adjusted risk estimates would provide a more robust understanding of predictors of adverse outcomes in elderly primigravida. Overall, the findings contribute to the growing body of evidence indicating that first pregnancies at advanced maternal age are associated with increased fetal risk. These results underscore the importance of vigilant antenatal care, individualized risk assessment, and strengthened perinatal services for elderly primigravida, while also highlighting the need for further large-scale studies to refine management strategies and optimize outcomes for both mother and child.

CONCLUSION

Pregnancy outcomes among elderly primigravida women remain heterogeneous, yet this study demonstrates that favorable maternal and fetal outcomes are achievable when pregnancies are appropriately monitored and managed. Although advancing maternal age inherently increases vulnerability to obstetric and age-related medical challenges, most women in the present cohort experienced uncomplicated deliveries without significant adverse consequences. Maternal age alone did not appear to be a decisive factor for hypertensive complications; however, the tendency toward increased obstetric interventions, particularly cesarean delivery, warrants careful evaluation to distinguish between true clinical necessity and age-based caution. These findings underscore the importance of timely antenatal surveillance, access to comprehensive emergency obstetric services, and skilled intrapartum care in mitigating risks associated with first pregnancies at advanced maternal age, thereby reinforcing that safe motherhood and favorable fetal outcomes remain attainable in this growing population.

AUTHOR CONTRIBUTIONS

Author	**Contribution**
Asma Iqbal	Substantial Contribution to study design, analysis, acquisition of Data Manuscript Writing Has given Final Approval of the version to be published
Saima Parveen*	Substantial Contribution to study design, acquisition and interpretation of Data Critical Review and Manuscript Writing Has given Final Approval of the version to be published
Parveen Naveed	Substantial Contribution to acquisition and interpretation of Data Has given Final Approval of the version to be published
Tabassum Ikram	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published
Sumbal Afzal Khan	Contributed to Data Collection and Analysis Has given Final Approval of the version to be published

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