International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
**Indexing:** Embase
**Impact Factor (RJIF):** 6.71

www.gynaecologyjournal.com
2026; 10(1): 547-554
Received: 21-10-2025
Accepted: 24-11-2025

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# Fetomaternal outcomes in elderly primigravida: A one-year retrospective observational study at a tertiary care centre

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**DOI:** https://www.doi.org/10.33545/gynae.2026.v10.i1g.1923

**Abstract**
**Background:** Delayed childbearing has resulted in an increasing number of women conceiving for the first time at advanced maternal age. Pregnancies in elderly primigravida are associated with higher rates of medical complications, increased operative delivery, and adverse neonatal outcomes due to age-related physiological changes and the growing use of assisted reproductive techniques.[1–3]
**Methods:** This retrospective observational study was conducted over a one-year period at Amrita Institute of Medical Sciences, Kochi, a tertiary care teaching hospital. During the study period, 1182 deliveries occurred, of which 50 women were elderly primigravida (≥35 years), giving an incidence of 4.23%. Maternal demographic characteristics, socioeconomic status, educational status, medical comorbidities, mode of conception, obstetric outcomes, intraoperative and postoperative complications, and neonatal outcomes were analysed. Twins were considered as separate neonates. Data were expressed as frequencies and percentages.
**Results:** The majority of women were aged 35–39 years (60%), while 40% were aged ≥40 years. According to the Modified Kuppuswamy classification, 56% belonged to the upper middle and 44% to the lower middle socioeconomic class. Gestational diabetes mellitus was the most common maternal complication (40%). Followed by Hypertensive disorders of pregnancy: 30%, Overt diabetes mellitus: 20% and Hypothyroidism: 18%. Assisted reproductive techniques accounted for 56% of conceptions. Caesarean section was the predominant mode of delivery (82%). Intraoperative complications were infrequent; postpartum haemorrhage occurred in one patient (2%), and postoperative urinary retention was noted in one patient (2%), both managed conservatively. A total of 56 neonates were delivered, including six twin gestations. Adverse neonatal outcomes were observed in 30 neonates (53.6%), NICU admission was required in 24 neonates (42.9%), and neonatal mortality occurred in two cases (3.6%).The observed neonatal morbidity profile reflects the tertiary referral nature nature of the study centre with advanced neonatal intensive care and paediatric cardiology services.

**Keywords:** Elderly primigravida, advanced maternal age, fetomaternal outcomes

## 1. Introduction
Maternal age is an important determinant of pregnancy outcome, and pregnancy in elderly primigravida women has long been recognised as a high-risk condition. Elderly primigravida is defined as a woman experiencing her first pregnancy at or beyond 35 years of age [1]. Early studies have demonstrated that pregnancy outcomes in elderly primigravida women are less favourable when compared to younger women, with increased maternal and perinatal complications [2].
Advancing maternal age is strongly associated with an increased risk of chromosomal abnormalities, particularly aneuploidy, which contributes to higher rates of fetal loss and congenital anomalies [3]. In addition, several large studies have shown that increasing maternal age is independently associated with adverse obstetric outcomes such as gestational diabetes mellitus, hypertensive disorders of pregnancy, operative delivery, and postpartum complications [4-7]. These risks are attributed to age-related physiological changes, including altered glucose metabolism, endothelial dysfunction, and reduced cardiovascular reserve [7].
Pregnancies in elderly primigravida women are also associated with adverse perinatal outcomes, including preterm birth, low birth weight, increased neonatal intensive care unit admission, and perinatal mortality [8, 11]. The increasing use of assisted reproductive technologies among women of advanced maternal age has further influenced pregnancy outcomes, contributing to higher

intervention rates and increased obstetric surveillance [8, 9].

Studies from different populations have reported variable maternal and neonatal outcomes in elderly primigravida pregnancies, influenced by healthcare access, referral patterns, and availability of specialised obstetric and neonatal services [9-12]. In developing countries, many elderly primigravida women are referred to tertiary care centres due to associated medical disorders or fetal complications, thereby increasing the observed burden of adverse outcomes [12].

Professional bodies recognise pregnancy in older women as high risk and recommend enhanced antenatal surveillance and delivery in centres with appropriate facilities [13]. Large population-based studies and systematic reviews have further confirmed the association between delayed childbearing and adverse pregnancy outcomes [14, 15].

In view of the rising incidence of elderly primigravida pregnancies and the limited data from tertiary care centres managing high-risk obstetric populations, the present study was undertaken to evaluate the maternal and neonatal outcomes among elderly primigravida women delivered at a tertiary care centre.

## 2. Materials and Methods

The present retrospective observational study was conducted in the Department of Obstetrics and Gynaecology at Amrita Institute of Medical Sciences, Kochi, a tertiary care teaching hospital with advanced neonatal intensive care and paediatric cardiology facilities, from January 2025 to December 2025.

All elderly primigravida women admitted to the Department of Obstetrics and Gynaecology during the study period were included. Elderly primigravida was defined as a woman experiencing her first pregnancy at or beyond 35 years of age.[1] Eligible elderly primigravida women fulfilling the inclusion criteria were enrolled in the study.

Women who did not meet the inclusion criteria or had incomplete medical records were excluded from the study.

At admission, a detailed obstetric history and clinical examination were carried out. Routine laboratory investigations were performed as per institutional protocol. Obstetric ultrasonography was undertaken to assess fetal growth, gestational age, and placental localisation. Details regarding antenatal complications, mode of conception, mode of delivery, and intraoperative and postoperative maternal complications were recorded in a predesigned proforma.

Neonatal outcomes were evaluated for all deliveries. In cases of twin gestations, each neonate was considered separately for analysis. Neonatal parameters assessed included adverse neonatal outcomes, requirement for neonatal intensive care unit (NICU) admission, and neonatal mortality.

All women received antenatal, intrapartum, and postpartum care in accordance with institutional protocols for high-risk pregnancies and recommended guidelines for pregnancy in older women [13].

Data were analysed using descriptive statistics and expressed as frequencies and percentages.

## 3. Results and Observations

The present study was conducted from January 2025 to December 2025 at Amrita Institute of Medical Sciences, Kochi, and included 50 elderly primigravida women (≥35 years).

### 3.1 Incidence

During the study period, a total of 1182 deliveries were conducted at the institution. Of these, 50 women were elderly primigravida, yielding an incidence of 4.23%.

### 3.2 Maternal demographic characteristics

#### 3.2.1 Age distribution

Most women belonged to the 35–39 years age group (60%), while 40% were aged ≥40 years.

**Table 1:** Distribution of respondents based on age

| Age in years | Percentage |
|---|---|
| 35-39 | 60 |
| ≥40 | 40 |
| Total | 100 |

#### 3.2.2 Religion

The majority of the study population belonged to the Hindu religion (72%), followed by Muslims (18%) and Christians (10%).

**Table 2:** Distribution of respondents based on religion

| Religion | Percentage |
|---|---|
| Hindu | 72 |
| Muslim | 18 |
| Christian | 10 |
| Total | 100 |

#### 3.2.3 Socioeconomic status (SES)

Based on the Modified Kuppuswamy classification, 56% of women belonged to the upper middle socioeconomic class, while 44% were from the lower middle socioeconomic class.

**Table 3:** Distribution of respondents based on SES

| SES | Percentage |
|---|---|
| Upper middle | 56% |
| Lower middle | 44% |
| Total | 100% |

### 3.3 Period of gestation

From the data presented in Table 4 and figuren 1, it can be seen that most women delivered at term (≥37 weeks), accounting for 35 cases (70%). Preterm delivery (<37 weeks) was observed in 15 women (30%). No post-term deliveries (>40 weeks) were recorded in the study.

**Table 4:** Distribution of respondents based on period of gestation

| Period of gestation | Number of cases | Percentage |
|---|---|---|
| Pre-term (<37 weeks) | 15 | 30% |
| Term (≥37 weeks) | 35 | 70% |
| Post-term (>40 weeks) | 0 | 0% |
| Total | 50 | 100% |

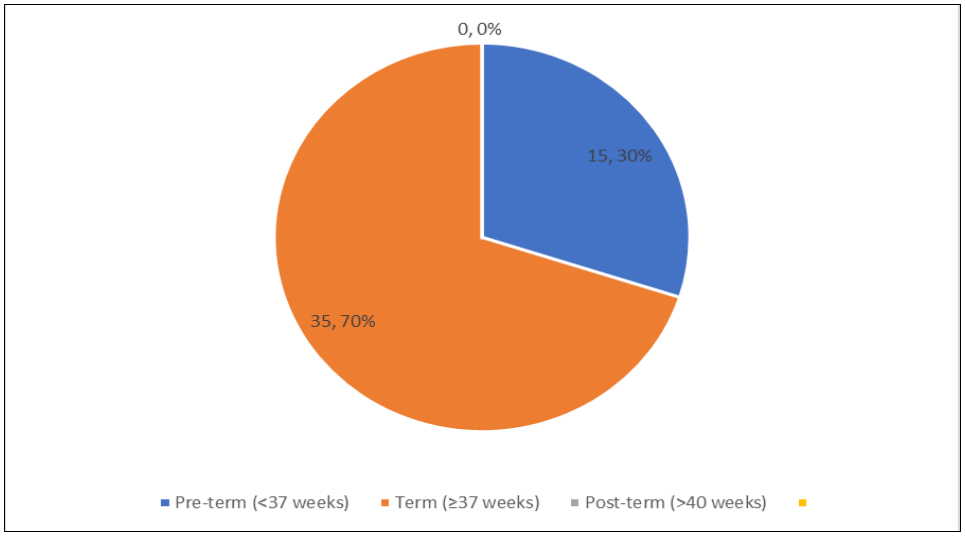


**Fig 1:** Distribution of respondents based on period of gestation

### 3.4 Antenatal comorbidities

Among the 50 elderly primigravida women, 42 women (84%) had at least one antenatal comorbidity, whereas 8 women (16%) had no associated medical disorders. Of those with comorbidities, 16 women (32%) had a single antenatal comorbidity, while 26 women (52%) had two or more coexisting antenatal comorbidities. Table 5 and Figure 2 present the data on antenatal comorbidity burden in the study subjects. Gestational diabetes mellitus was the most common antenatal complication, observed in 40% of women. Hypertensive disorders of pregnancy were noted in 30%, overt diabetes mellitus in 20%, and hypothyroidism in 18% of cases. The total percentages exceeds 100% as several women had more than one antenatal comorbidity.

**Table 5:** Distribution of respondents based on antenatal comorbidities

| Antenatal comorbidities | Number of cases | Percentage |
|---|---|---|
| No comorbidities | 8 | 16% |
| Exactly one comorbidity | 16 | 38% |
| ≥2 comorbidities | 26 | 46% |

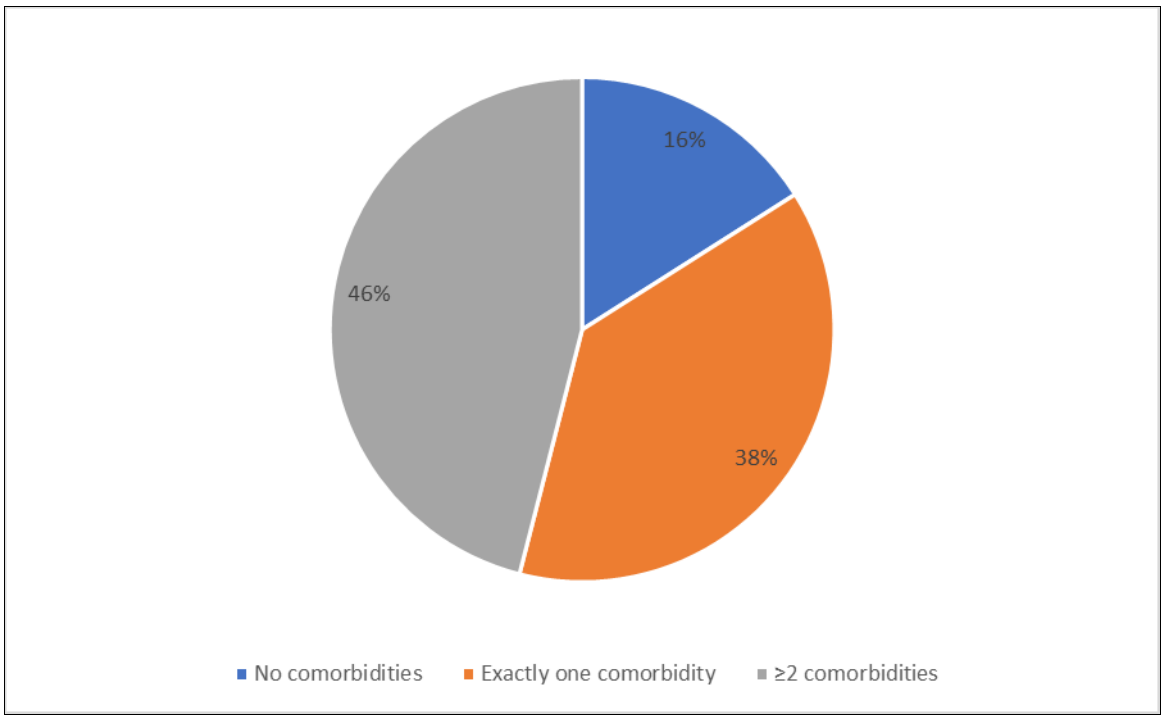


**Fig 3:** Distribution of Comorbidity Burden in elderly primigravida

The comorbidities in the study subjects led to several complications and the distribution of these complications are listed in Table 6.

**Table 6:** Distribution of respondents based upon the medical disorders

| Complication | Number of cases(n=50) | Percentage |
|---|---|---|
| **No comorbs** | 8 | 16% |
| **Diabetes:** | 20 | 40% |
| **Gestational Diabetes Mellitus(GDM)** | 12 | 24% |
| GDM on MNT | 1 | 2% |
| GDM on OHA | 8 | 16% |
| GDM on Insulin | 3 | 6% |
| **Overt Diabetes mellitus** | 8 | 16% |
| Overt DM on Insulin | 2 | 4% |
| Overt DM on Insulin + OHA | 6 | 12% |
| **Hypertensive disorders in pregnancy** | 10 | 20% |
| Chronic hypertension | 2 | 4% |
| Gestational hypertension | 3 | 6% |
| Preeclampsia | 3 | 6% |
| Severe pre eclampsia | 1 | 2% |
| Chronic hypertension with superimposed preeclampsia | 1 | 2% |
| **Hypothyroidism** | 9 | 18% |
| **Other medical disorders*** <br> Other medical disorders included: <br> Bronchial asthma <br> Hashimotos thyroiditis <br> Beta thalassemia trait <br> Multiple sclerosis <br> Pancreatitis with cholelithiasis <br> Fibroid complicating pregnancy | 6 | 12% |

The gestational comorbidities such as hypertension, diabetes and hypothyroidism in elderly primigravida are illustrated in Figures 4, 5 and 6.

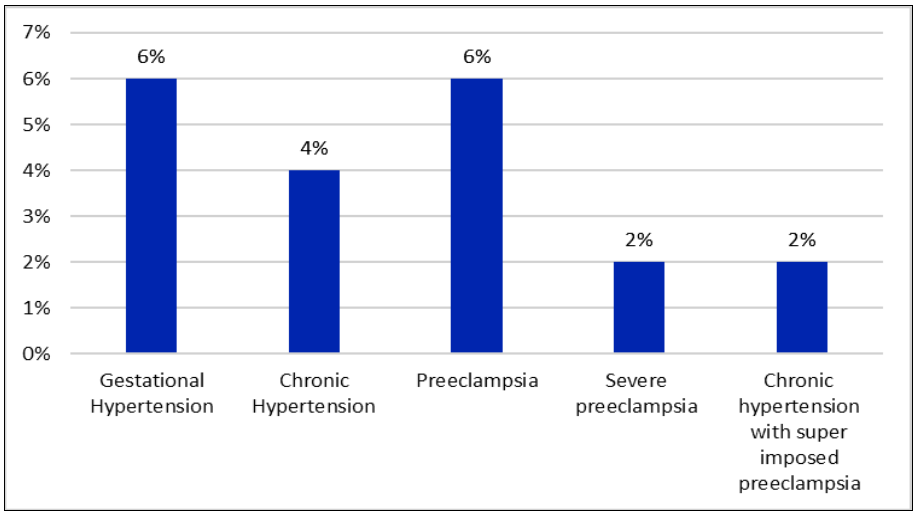


**Fig 4:** Hypertensive Disorders

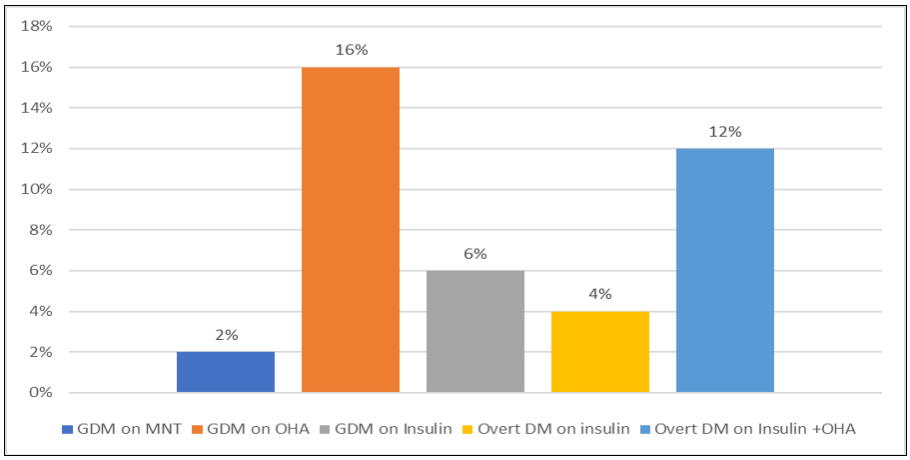


**Fig 5:** Diabetes Subtypes (n=50)

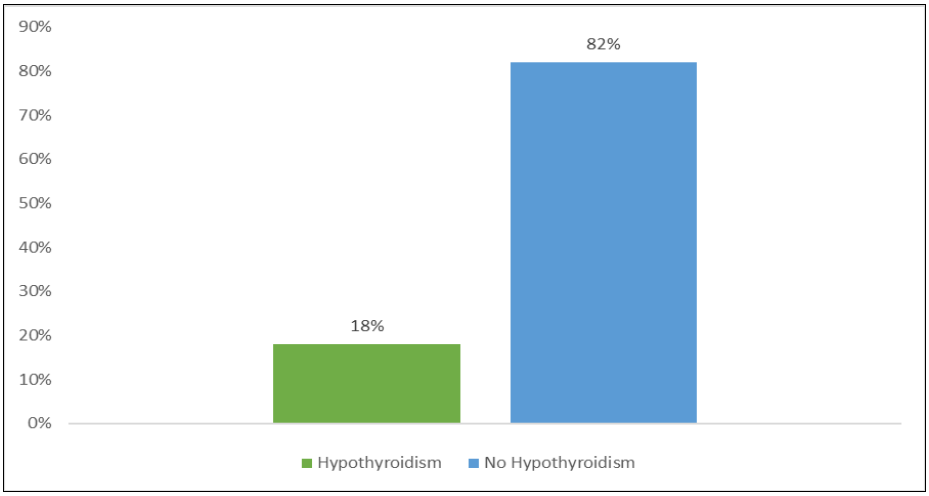


**Fig 6:** Hypothyroidism Status (n=50)

### 3.5 Mode of conception

From Table 7 it can be seen that assisted reproductive techniques were used in 56% of pregnancies, while 44% of women conceived spontaneously.

**Table 7:** Distribution of respondents based on mode of conception

| Mode of conception | Percentage |
|---|---|
| Assisted reproductive techniques | 56% |
| Spontaneous Conception | 44% |
| Total | 100% |

### 3.6 Mode of delivery

As can be seen in table 8 and figure 7 that caesarean section was the predominant mode of delivery and was performed in 41 women (82%). Vaginal delivery occurred in 9 women (18%). Among vaginal deliveries, spontaneous vaginal delivery was observed in 7 women (14%), while instrumental vaginal delivery (forceps- or vacuum-assisted) was required in 2 women (4%).

**Table 8:** Distribution of respondents based on mode of delivery

| Mode of delivery | Number of cases | Percentage |
|---|---|---|
| Caesarean section | 41 | 82% |
| Spontaneous vaginal delivery | 7 | 14% |
| Instrumental vaginal delivery | 2 | 4% |

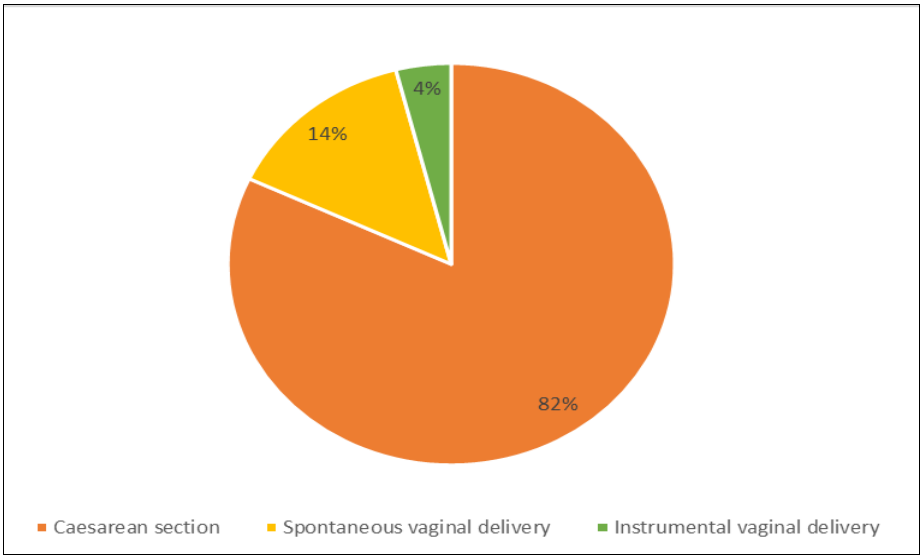


**Fig 7:** Mode of delivery

### 3.7 Intraoperative and postoperative maternal complications

Maternal intraoperative and postoperative complications were infrequent. Postpartum haemorrhage occurred in one patient (2%), and postoperative urinary retention was observed in one patient (2%). Both complications were managed conservatively.

### 3.8 Neonatal outcomes

Neonatal outcomes were assessed on a per-neonate basis. In

pregnancies with multiple gestations, each neonate was analysed individually. A total of 56 neonates were delivered during the study period, including six twin gestations. Outcome categories were not mutually exclusive, as an individual neonate could experience more than one morbidity.

### 3.9 Sex distribution

As can be seen in table 9, among the neonates, male babies predominated. Male neonates accounted for 32 (57.1%), while female neonates accounted for 24 (42.9%) of the total neonatal population.

**Table 9:** Distribution of respondents based on sex of the baby

| Sex distribution | Number of cases | Percentage |
|---|---|---|
| Male | 32 | 57.1% |
| Female | 24 | 42.9% |
| Total | 56 | 100% |

### 3.10 Birth weight

From the data presented in table 10,.most neonates had a satisfactory birth weight. Thirty-eight neonates (67.9%) had a birth weight ≥2.5 kg, whereas 18 neonates (32.1%) were of low birth weight (<2.5 kg). Low birth weight was more frequently observed among preterm deliveries and multiple gestations.

**Table 10:** Distribution of respondents based on birth weight of the baby

| Birth weight | Number of cases | Percentage |
|---|---|---|
| ≥2.5 kg | 38 | 67.9% |
| <2.5 kg | 18 | 32.1% |
| Total | 56 | 100% |

### 3.11 Apgar score at 5 minutes

The distribution of Apgar scores at 5 minutes among the 56 neonates were determined and given in table 11. The scores were Apgar 9/10 in 7 neonates (12.5%), 8/10 in 28 neonates (50.0%), 7/10 in 15 neonates (26.8%), and 6/10 in 6 neonates (10.7%). Overall, 35 neonates (62.5%) had Apgar scores of ≥8/10, indicating good immediate neonatal adaptation.

**Table 11:** Distribution of respondents based on Apgar score of the baby

| Apgar Score | Number of cases | Percentage |
|---|---|---|
| 9/10 | 7 | 12.5% |
| 8/10 | 28 | 50% |
| 7/10 | 15 | 26.8% |
| 6/10 | 6 | 10.7% |
| Total | 56 | 100% |

### 3.12 Major neonatal morbidities and structural anomalies:

Of the 56 neonates, 32 babies (57.1%) had a normal neonatal outcome. Respiratory distress syndrome (RDS) was observed in 12 neonates (21.4%). Hyperbilirubinemia was noted in 5 neonates (8.9%), either as an isolated finding or in association with other morbidities as can be seen in the data presented in table 12. Congenital anomalies were identified in 16 neonates (28.6%). Congenital cardiac diseases constituted the majority, affecting 10 babies (17.9%). Other congenital anomalies included Edward syndrome, Klinefelter syndrome, EIF2B4 gene carrier state, ileal atresia, prominent cisterna magna, and ruptured omphalocele. Intraventricular hemorrhage (IVH) was observed in 2 neonates (3.6%). The neonatal outcome profile reflects the tertiary referral nature of the centre, with availability of advanced neonatal intensive care and pediatric cardiology services, resulting in referral of high-risk pregnancies.

**Table 12:** Neonatal outcomes among study neonates (n=56)

| Neonatal outcomes | Number of babies | Percentage (%) |
|---|---|---|
| **Normal neonatal outcome** | 32 | 57.1% |
| **Respiratory distress syndrome(RDS)** | 12 | 21.4% |
| **Hyperbilirubinemia** | 5 | 8.9% |
| **Congenital anomalies:** | 16 | 28.6% |
| (a) Congenital cardiac disease | 10 | 17.9% |
| I. ASD | | |
| II. DORV | 3 | 5.4% |
| III. TAPVC | 1 | 1.8% |
| IV. VSD | 1 | 1.8% |
| V. TOF | 3 | 5.4% |
| VI. Tricuspid pulmonary atresia, | 1 | 1.8% |
| PDA | 1 | 1.8% |
| (b) Other congenital anomalies* | 6 | 10.7% |
| **Intraventricular haemorrhage** | 2 | 3.6% |

*****Other congenital anomalies included Edward syndrome, Klinefelter syndrome, E1F2B4 gene carrier, ileal atresia, prominent cisterna magna ASD: Atrial septal defect, DORV: Double outlet right ventricle, TAPVC: Total anomalous pulmonary venous connections, VSD: entricular septal defect, TOF: Tetrology of fallot, PDA: Patent ductus arteriosus

**3.13 Neonatal mortality:** There were two neonatal deaths (3.6%), one due to a lethal congenital anomaly (ruptured omphalocele) and the other associated with severe prematurity and intracranial complications.

**Table 13:** Neonatal Mortality and Survival

| Neonatal mortality | Number of cases | Percentage (%) |
|---|---|---|
| Neonatal death | 2 | 3.6% |
| Survived | 54 | 96.4% |
| Total | 56 | 100% |

## 4. Discussion

The present study evaluated fetomaternal and neonatal outcomes among elderly primigravida women managed at a tertiary care referral centre. With the increasing trend of delayed childbearing due to sociocultural and professional factors, pregnancies in elderly primigravidae are being encountered more frequently in contemporary obstetric practice. Advanced maternal age is a well-established independent risk factor for adverse pregnancy outcomes, owing to age-related physiological changes and a higher prevalence of pre-existing medical disorders [1-2].

In this study, the majority of women were aged between 35 and 39 years, with a substantial proportion aged ≥40 years, a distribution comparable to that reported in previous studies on elderly primigravida pregnancies [2-4]. Antenatal comorbidities were common, reflecting the high-risk nature of pregnancies in advanced maternal age. Gestational diabetes mellitus (GDM) was the most frequent antenatal comorbidity observed. This finding is consistent with existing literature demonstrating a strong association between advancing maternal age and glucose intolerance during pregnancy, attributed to increased insulin resistance and reduced pancreatic β-cell reserve [5, 6]. In addition, a subset of women had overt diabetes mellitus, further contributing to increased obstetric and neonatal risk.

Hypertensive disorders of pregnancy constituted another major group of antenatal comorbidities, including chronic hypertension, gestational hypertension, and preeclampsia. Preeclampsia was observed more frequently among women of advanced maternal age, which has been attributed to endothelial dysfunction, reduced vascular compliance, and placental

maladaptation in older women [7, 8]. The presence of chronic hypertension further increased the risk of superimposed preeclampsia and adverse perinatal outcomes. Hypothyroidism was also noted in a considerable proportion of women, a finding supported by studies reporting increased thyroid dysfunction with advancing maternal age and its association with adverse pregnancy and neonatal outcomes when inadequately controlled [9].

More than half of the pregnancies in this cohort were conceived using assisted reproductive techniques (ART). Increased utilisation of ART among elderly primigravida women has been widely reported and reflects both delayed fertility and referral bias to tertiary care centres [10, 11]. ART pregnancies are known to be associated with increased obstetric surveillance, higher rates of hypertensive disorders, operative delivery, and neonatal morbidity [12].

The caesarean section rate in the present study was high, comparable to rates reported in similar studies involving elderly primigravidae [6, 13]. Factors contributing to this included advanced maternal age, presence of multiple antenatal comorbidities such as GDM and hypertensive disorders, ART conception, and a lower threshold for operative delivery to optimise neonatal outcomes. Despite the high operative delivery rate, maternal intraoperative and postoperative complications were infrequent, indicating the effectiveness of planned delivery and multidisciplinary management in a tertiary care setting [14].

Neonatal outcomes were analysed on a per-neonate basis, accounting for multiple gestations, resulting in a total of 56 neonates, including six twin gestations. Although the majority of neonates had a favourable outcome, a considerable burden of neonatal morbidity was observed. Respiratory distress syndrome (RDS) was the most common neonatal morbidity, affecting 12 neonates, predominantly associated with prematurity and multiple gestations. Similar findings have been reported in previous studies, where prematurity and advanced maternal age were linked to increased respiratory morbidity [15, 16]. Hyperbilirubinemia was observed in five neonates, either as an isolated finding or in association with other morbidities.

Congenital anomalies were identified in 16 neonates, with congenital cardiac diseases constituting the majority, affecting 10 neonates. Advanced maternal age is a recognised risk factor for chromosomal and structural anomalies [3]. In the present study, other congenital anomalies included Edwards syndrome, Klinefelter syndrome, EIF2B4 gene carrier state, ileal atresia, prominent cisterna magna, and intraventricular haemorrhage. The relatively higher proportion of cardiac anomalies observed is likely influenced by the tertiary referral nature of the centre, with availability of advanced neonatal intensive care and paediatric cardiology services, resulting in referral and delivery of pregnancies complicated by suspected or confirmed fetal cardiac anomalies [13, 14].

Two neonatal deaths were recorded in this study, yielding a neonatal mortality rate of 3.6%. One neonatal death was attributed to a lethal congenital anomaly (ruptured omphalocele), while the other was associated with severe prematurity and intracranial complications. Although neonatal mortality was low, these findings highlight the cumulative impact of prematurity, congenital anomalies, and severe neonatal morbidity on survival outcomes in elderly primigravida pregnancies [15].

Overall, the findings of this study emphasise that elderly primigravida pregnancies are characterised by a high prevalence of antenatal comorbidities particularly gestational diabetes mellitus and hypertensive disorders along with increased operative delivery rates and significant neonatal morbidity. While maternal outcomes can be optimised through vigilant antenatal care and planned delivery, neonatal outcomes remain a concern. Early risk stratification, strict control of medical comorbidities, multidisciplinary management, and delivery in well-equipped tertiary care centres are essential to improve fetomaternal outcomes in this high-risk group [16].

## 5. Conclusion

Elderly primigravida pregnancies are associated with an increased prevalence of metabolic and hypertensive comorbidities, higher utilisation of assisted reproductive techniques, and a predominance of operative delivery, as documented in earlier studies [1-5]. In the present study, major intraoperative and postoperative maternal complications were infrequent; however, neonatal morbidity remained substantial, with a considerable proportion of neonates requiring NICU admission. The relatively high burden of adverse neonatal outcomes observed may, in part, reflect the study setting, as the institution functions as a tertiary care referral centre with advanced neonatal intensive care and paediatric cardiology services, resulting in a higher proportion of high-risk fetuses being managed. Similar observations have been reported from other tertiary centres catering to high-risk obstetric populations [6-10]. These findings emphasise the importance of early risk stratification, multidisciplinary antenatal surveillance, and planned delivery in well-equipped tertiary care centres to optimise fetomaternal outcomes in elderly primigravida women [11-15].

## Conflict of Interest

The authors have no conflict of interest.

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**How to Cite This Article**
Murali V, Bhargavi B, Kochumon SP, Bhadran RS, Radhamany K, Nair CKK. Fetomaternal outcomes in elderly primigravida: A one-year retrospective observational study at a tertiary care centre. International Journal of Clinical Obstetrics and Gynaecology 2026; 10(1): 547-554