Maternal and neonatal outcomes of pregnancies in women aged 40 years and above

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Abstract

Background: The incidence of pregnancy among women aged 40 years and above has increased worldwide due to delayed childbearing, improved socioeconomic status, and advances in assisted reproductive techniques. Advanced maternal age is associated with an increased risk of adverse maternal and neonatal outcomes, making these pregnancies an important concern in obstetric practice.

Aim: To evaluate the maternal and neonatal outcomes of pregnancies in women aged 40 years and above managed at a tertiary care center.

Materials and Methods:A hospital-based observational descriptive study was conducted in the Department of Obstetrics and Gynecology of a tertiary care teaching hospital. A total of 150 pregnant women aged 40 years and above with a gestational age of 28 weeks or more were included using consecutive sampling. Demographic, obstetric, maternal, and neonatal data were collected using a predesigned case record form. Maternal outcomes included gestational hypertension, preeclampsia, gestational diabetes mellitus, placenta previa, placental abruption, preterm labour, postpartum haemorrhage, maternal ICU admission, and mode of delivery. Neonatal outcomes included birth weight, Apgar score, preterm birth, NICU admission, respiratory distress, congenital anomalies, stillbirth, early neonatal death, and perinatal mortality. Data were analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages.

Results: Among the 150 participants, 68.0% were aged 40–42 years, and 69.3% were multigravida. Gestational diabetes mellitus (19.3%), preterm labour (22.7%), and gestational hypertension (16.0%) were the most common maternal complications. Caesarean section was performed in 61.3% of women. Preterm birth occurred in 22.7% of neonates, while 20.0% had low birth weight. NICU admission was required in 16.0% of newborns, respiratory distress was observed in 9.3%, and perinatal mortality was 3.3%. The mean birth weight was 2.82 ± 0.54 kg, and the mean Apgar score at 5 minutes was 8.8 ± 0.8.

Conclusion: Pregnancy in women aged 40 years and above is associated with an increased incidence of maternal and neonatal complications. Comprehensive antenatal care, early identification of high-risk pregnancies, timely obstetric intervention, and delivery at tertiary care centers are essential to improve maternal and neonatal outcomes in this age group.

Keywords: Advanced maternal age; Pregnancy; Neonatal outcome

Introduction

The trend of delayed childbearing has increased worldwide over the past few decades due to higher educational attainment, career aspirations, improved socioeconomic status, effective contraception, and the widespread use of assisted reproductive technologies. Consequently, pregnancies among women aged 40 years and above have become increasingly common and represent an important area of obstetric practice.[1,2] Advanced maternal age is generally defined as pregnancy occurring at 35 years or older, while pregnancies in women aged 40 years and above are considered to carry substantially higher maternal and fetal risks. Although many women in this age group experience successful pregnancies, increasing maternal

age has been associated with a greater incidence of medical and obstetric complications.[3,4]

Women aged 40 years and above are more likely to develop pregnancy-related complications such as gestational hypertension, preeclampsia, gestational diabetes mellitus, placenta previa, placental abruption, postpartum hemorrhage, and increased operative delivery, particularly cesarean section.[1,5,6] The higher prevalence of chronic medical disorders, reduced physiological reserve, and age-related changes in reproductive organs contribute to these adverse outcomes.[2,4]

Advanced maternal age also influences neonatal outcomes. Infants born to older mothers are at increased risk of preterm birth, low birth weight, fetal growth restriction, low Apgar scores, neonatal intensive care unit (NICU) admission, stillbirth, and perinatal mortality.[7,8] These adverse outcomes are thought to result from placental insufficiency, maternal comorbidities, chromosomal abnormalities, and pregnancy-related complications.[4,9]

Several studies conducted across different populations have consistently demonstrated a significant association between advanced maternal age and unfavorable maternal and neonatal outcomes. However, the magnitude of these risks varies according to healthcare access, antenatal care, socioeconomic status, and institutional management protocols.[3,5,10]

Tertiary care centers receive a large proportion of high-risk pregnancies and provide comprehensive obstetric and neonatal services. Evaluating pregnancy outcomes among women aged 40 years and above in such settings is essential to understand the burden of maternal and neonatal complications and to optimize clinical management strategies.

Therefore, the present study was undertaken to evaluate the maternal and neonatal outcomes of pregnancies in women aged 40 years and above managed at a tertiary care center.

Material and Methods

This hospital-based observational descriptive study will be conducted in the Department of Obstetrics and Gynecology of a tertiary care teaching hospital over a period of 12 months or until the required sample size is achieved. The study population will comprise pregnant women aged 40 years and above who are admitted for delivery at the tertiary care center during the study period.

A total of 150 pregnant women aged 40 years and above will be included in the study using consecutive sampling. All eligible women fulfilling the inclusion criteria during the study period will be recruited until the desired sample size is achieved. Pregnant women aged 40 years and above with singleton or multiple pregnancies, having a gestational age of 28 weeks or more, delivering at the study hospital, and willing to provide written informed consent will be included in the study. Women who do not provide informed consent, those referred after delivery from another institution with incomplete clinical records, and patients with insufficient obstetric or neonatal data will be excluded. After obtaining approval from the Institutional Ethics Committee and written informed consent from the participants, relevant demographic, obstetric, and clinical details will be recorded using a predesigned and pretested case record form. Information regarding maternal age, gravidity, parity, gestational age, antenatal complications, medical disorders, mode of conception, mode of delivery, maternal complications, birth weight, Apgar score, gestational age of the newborn, NICU admission, neonatal complications, and perinatal outcome will be collected from patient interviews and hospital records.

Maternal outcomes assessed will include gestational hypertension, preeclampsia/eclampsia, gestational diabetes mellitus, placenta previa, placental abruption, premature rupture of membranes, preterm labor, mode of delivery, postpartum hemorrhage, maternal ICU admission, and maternal mortality, if any. Neonatal outcomes will include birth weight, low birth weight, prematurity, Apgar score at 1 and 5 minutes, NICU admission, respiratory distress, congenital anomalies, stillbirth, early neonatal death, and perinatal mortality. The collected data will be entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous variables will be expressed as mean ± standard deviation, while categorical variables will be presented as frequencies and percentages. Appropriate statistical tests, including the Chi-square test or Fisher's exact test for categorical variables and Student's t-test for continuous variables wherever applicable, will be used. A p-value of less than 0.05 will be considered statistically significant.

Prior approval from the Institutional Ethics Committee will be obtained before commencement of the study. Written informed consent will be obtained from all participants, and confidentiality of the collected information will be strictly maintained throughout the study.

Results

Table 1: Table 1 shows the baseline demographic and obstetric characteristics of the study participants. Out of 150 pregnant women, the majority (68.0%) belonged to the age group of 40–42 years, followed by 24.0% in the 43–45 years age group and 8.0% aged 46 years or above. Multigravida women constituted 69.3% of the study population, while 30.7% were primigravida. Most participants (72.0%) were multiparous. A total of 77.3% of women delivered at term

(≥37 weeks), whereas 22.7% had preterm deliveries. Spontaneous conception was observed in 86.0% of pregnancies, while assisted reproductive techniques were used in 14.0% of cases.

Table 2: Table 2 depicts the maternal complications observed among the study participants. Gestational diabetes mellitus was the most common complication, affecting 19.3% of women, followed by preterm labour (22.7%) and gestational hypertension (16.0%). Preeclampsia/eclampsia was reported in 12.0% of participants, while premature rupture of membranes occurred in 10.0%. Placenta previa and placental abruption were observed in 6.0% and 2.7% of women, respectively. Postpartum haemorrhage occurred in 5.3% of cases, maternal ICU admission was required in 2.0%, and maternal mortality was reported in one patient (0.7%).

Table 3: Table 3 presents the mode of delivery among women aged 40 years and above. Elective caesarean section was the most common mode of delivery, accounting for 36.0% of cases, followed by emergency caesarean section in 25.3%. Normal vaginal delivery was achieved in 32.0% of women, while instrumental vaginal delivery was performed in 6.7% of cases. Overall, caesarean section constituted the predominant mode of delivery in the study population.

Table 4: Table 4 summarizes the neonatal outcomes of the newborns. Preterm birth was observed in 22.7% of neonates, while 20.0% had low birth weight. NICU admission was required for 16.0% of newborns, and respiratory distress was reported in 9.3%. An Apgar score of less than 7 at 5 minutes was noted in 7.3% of neonates. Congenital anomalies were present in 3.3% of newborns. Stillbirth and early neonatal death were observed in 2.0% and 1.3% of cases, respectively, resulting in an overall perinatal mortality rate of 3.3%. Table 5: Table 5 shows the birth weight and Apgar score of the newborns. The mean birth weight was 2.82 ± 0.54 kg. The mean Apgar scores at 1 minute and 5 minutes were 7.4 ± 1.2 and 8.8 ± 0.8, respectively. Low birth weight (<2.5 kg) was observed in 20.0% of newborns, whereas 80.0% had a birth weight of 2.5 kg or more, indicating that the majority of neonates had a satisfactory birth weight and favorable immediate postnatal condition.

Table 1. Baseline demographic and obstetric characteristics of the study participants (n = 150)

Variable	Frequency (n)	Percentage (%)
Age (years)		
40–42	102	68.0
43–45	36	24.0
≥46	12	8.0
Gravidity		
Primigravida	46	30.7
Multigravida	104	69.3
Parity		
Nulliparous	42	28.0
Multiparous	108	72.0
Gestational age at delivery		
28–36+6 weeks	34	22.7
≥37 weeks	116	77.3
Mode of conception		
Spontaneous	129	86.0
Assisted reproductive techniques	21	14.0

Table 2. Maternal complications among women aged 40 years and above (n = 150)

Maternal complication	Frequency (n)	Percentage (%)
Gestational hypertension	24	16.0
Preeclampsia/Eclampsia	18	12.0
Gestational diabetes mellitus	29	19.3
Placenta previa	9	6.0
Placental abruption	4	2.7
Premature rupture of membranes	15	10.0
Preterm labour	34	22.7
Postpartum haemorrhage	8	5.3
Maternal ICU admission	3	2.0
Maternal mortality	1	0.7

Table 3. Mode of delivery among study participants (n = 150)

Mode of delivery	Frequency (n)	Percentage (%)
Normal vaginal delivery	48	32.0
Instrumental vaginal delivery	10	6.7
Elective caesarean section	54	36.0
Emergency caesarean section	38	25.3
Total	**150**	**100.0**

Table 4. Neonatal outcomes among newborns (n = 150)

Neonatal outcome	Frequency (n)	Percentage (%)
Low birth weight (<2.5 kg)	30	20.0
Preterm birth	34	22.7
Apgar score <7 at 5 minutes	11	7.3
NICU admission	24	16.0
Respiratory distress	14	9.3
Congenital anomalies	5	3.3
Stillbirth	3	2.0
Early neonatal death	2	1.3
Perinatal mortality	5	3.3

Table 5. Birth weight and Apgar score of newborns (n = 150)

Variable	Value
Birth weight (kg), Mean ± SD	**2.82 ± 0.54**
Apgar score at 1 minute, Mean ± SD	**7.4 ± 1.2**
Apgar score at 5 minutes, Mean ± SD	**8.8 ± 0.8**
Birth weight <2.5 kg, n (%)	**30 (20.0)**
Birth weight ≥2.5 kg, n (%)	**120 (80.0)**

Discussion

The present study evaluated the maternal and neonatal outcomes of pregnancies in women aged 40 years and above managed at a tertiary care center. Advanced maternal age is increasingly encountered in modern obstetric practice due to delayed childbearing, improved socioeconomic status, and the availability of assisted reproductive techniques. Pregnancies in this age group are considered high-risk because of the increased incidence of obstetric and neonatal complications.

In the present study, the majority of women belonged to the age group of 40–42 years, and most were multigravida. Similar demographic findings have been reported by Wang et al., who observed that pregnancies among women aged 40 years and above were more frequently seen in multiparous women and were associated with a higher prevalence of obstetric complications.[12]

Gestational diabetes mellitus, preterm labour, and gestational hypertension were among the most common maternal complications observed in the present study. These findings are consistent with those reported by Bayrampour and Heaman, who demonstrated that advanced maternal age is associated with an increased risk of pregnancy-related complications and a greater need for obstetric interventions.[11] The rate of cesarean section in the present study was high, with both elective and emergency cesarean deliveries accounting for the majority of births. Similar observations were reported by Ludford et al., who found that women of advanced maternal age had significantly higher cesarean delivery rates owing to obstetric complications and increased clinical vigilance during labor.[13]

With regard to neonatal outcomes, the present study demonstrated increased frequencies of preterm birth, low birth weight, NICU admission, respiratory distress, and perinatal mortality. These findings are comparable with those reported by Fretts, who emphasized that advancing maternal age is associated with adverse neonatal outcomes because of placental dysfunction, maternal comorbidities, and fetal complications.[14] Furthermore, Khalil et al. reported that women aged 40 years and above have an increased risk of adverse maternal and perinatal outcomes, including hypertensive disorders, operative delivery, preterm birth, and neonatal morbidity.[15] The findings of the present study are in agreement with these observations, highlighting the importance of meticulous antenatal surveillance and timely obstetric intervention in this high-risk group.

Overall, the findings of the present study support the existing evidence that pregnancies in women aged 40 years and above are associated with increased maternal and neonatal morbidity. Appropriate antenatal care, early identification of high-risk pregnancies, multidisciplinary management, and delivery in well-equipped tertiary care centers can contribute to improved maternal and neonatal outcomes.

Conclusion

The present study concludes that pregnancies in women aged 40 years and above are associated with an increased incidence of maternal and neonatal complications. Gestational diabetes mellitus, gestational hypertension, preterm labour, and cesarean section were among the major maternal outcomes observed, while preterm birth, low birth weight, NICU admission, and adverse perinatal outcomes were the predominant neonatal complications. Early identification of high-risk pregnancies, comprehensive antenatal care, timely obstetric intervention, and delivery at tertiary care centers are essential for minimizing maternal and neonatal morbidity and improving pregnancy outcomes in this age group.

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