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Original research article

Evaluation and comparison of the effects of advanced maternal age on pregnancy outcomes

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Abstract

Introduction: Pregnancy in women aged 35 years or above is generally considered an advanced maternal age (AMA). AMA is associated with an increased rate of maternal and neonatal complications. Our present study assessed and compared the effect of AMA on maternal and neonatal outcomes.

Materials and Methods: The study was conducted among 120 rural young, middle-aged and elderly women, selected randomly outpatient at Department of Obstetrics and Gynaecology, Mamata Medical College, Khammam. Outcomes for women 35 years of age or older were compared with younger women. The current study had two groups, one of the study groups with maternal age above 35 years and other one was control group with age less than 35 years. Cases beyond 28 weeks of gestation, both primiparous and multiparous patients were included. Minimum 60 patients were included in each group. Gestational age, presentation, mode of delivery, indications for caesarean, maternal complications and foetal outcomes were analysed. Statistical tests were calculated using SPSS software version 20.0. $P \leq 0.05$ was considered statistically significant.

Results: In this study statistically significant difference in maternal complications like incidence of gestational diabetes, gestational hypertension and preterm labour were observed in advanced maternal age women.

Conclusion: Increasing incidence of maternal complications both obstetric and medical were observed in the advanced age mothers (AMA). Pregnancy in women 35 years or older was associated with an increased risk of gestational diabetes mellitus (GDM) and caesarean delivery.

Keywords: Advanced maternal age, foetal outcome, pregnancy outcome, obstetric complications, risk factors

Introduction

Advanced maternal age, defined as pregnancy in women aged 35 years or older, has become increasingly common in recent years. This trend can be attributed to various factors, including societal changes, career aspirations, and advancements in assisted reproductive technologies [1, 2]. However, pregnancy at an older age poses unique challenges and potential risks for both the mother and the baby. This introduction aims to explore the effects of advanced maternal age on pregnancy outcomes and highlight the importance of understanding these implications.

With the increasing trend of women delaying childbearing, it is crucial to examine the potential impact of advanced maternal age on pregnancy outcomes. Maternal age plays a significant role in fertility, pregnancy complications, and neonatal outcomes. Older women may face difficulties in conceiving naturally due to decreased ovarian reserve and a higher likelihood of age-related infertility [3-5]. Additionally, as maternal age advances, the risk of chromosomal abnormalities, such as Down syndrome, increases [6].

Pregnancy outcomes in advanced maternal age can be influenced by various factors. Advanced age is associated with an increased risk of pregnancy complications, including gestational diabetes, hypertensive disorders, such as preeclampsia, and placental abnormalities [7-9]. These complications can have adverse effects on both maternal and foetal health, leading to increased rates of preterm birth, low birth weight and stillbirth.

Furthermore, advanced maternal age is linked to an increased risk of caesarean section delivery. This may be attributed to a higher incidence of foetal distress, malpresentation, and maternal comorbidities that require medical intervention. The mode of delivery, whether vaginal or caesarean, can impact postpartum recovery and potential complications for the mother [10].

The potential risks associated with advanced maternal age extend beyond pregnancy and delivery. Long-term maternal health outcomes, such as an increased risk of cardiovascular disease and metabolic

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disorders, have been reported in women who had pregnancies at an older age. Additionally, offspring born to older mothers may face higher risks of genetic disorders, developmental delays, and chronic health conditions [11-14].

Understanding the effects of advanced maternal age on pregnancy outcomes is essential for healthcare providers in providing appropriate prenatal care, counselling, and support for women of advanced age who are planning or undergoing pregnancy. It allows for early identification of potential risks and the implementation of strategies to optimize pregnancy outcomes for both the mother and the baby [15, 16].

In view of this, advanced maternal age poses unique challenges and potential risks for both maternal and neonatal health. Pregnancy at an older age is associated with increased risks of pregnancy complications, adverse neonatal outcomes, and long-term health implications for both the mother and the child. By gaining a comprehensive understanding of the effects of advanced maternal age on pregnancy outcomes, healthcare providers can tailor prenatal care and support to mitigate these risks and improve the overall well-being of women and their offspring.

Materials and Methods

Subject Enrolment: This was a cross-sectional study included all pregnant women who attended antenatal care and delivered at Department of Obstetrics and Gynaecology, Mamata Medical College, Khammam. The study compared pregnant women who were aged 35 years or older at the time of delivery (AMA group) and the control group included pregnant women who were younger than 35 years (non-AMA group). After ethical approval was acquired from the Institutional Ethics Committee of Mamata Medical College, Khammam, data were collected from electronic and manual medical records.

The two groups were compared regarding their demographic data, medical history, and different maternal and neonatal outcomes. Demographic data included maternal age at delivery, body mass index (BMI), gravidity, and parity, pre-pregnancy maternal medical conditions (diabetes, hypertension, and hypothyroidism). Pregnancy outcomes included GDM, diagnosed according to the American Diabetes Association.

Neonatal outcomes included small for gestational age (SGA), defined as birth weight less than 2.5 kg, neonatal mortality, 1-and 5-minute Apgar scores, admission to intensive care unit, intrauterine foetal death (IUFD), and congenital anomalies.

Statistical Analysis: The collected data was analysed by descriptive and inferential statistics. The descriptive statistics include mean and percentage to assess the stress urinary incontinence among women. Inferential statistics analysis such as independent ‘t’ test and paired ‘t’ test were used for the effectiveness of pelvic floor exercise on stress urinary incontinence in experimental and control group. Chi-square was used to find out the association between the stress urinary incontinence with the selected demographic variables and clinical profile. Values were presented as mean ± SD.

Results

It is important to recall that the objective of this study is to provide an update of our current knowledge about the impact of advanced maternal age on pregnancy outcome. The population used for the current work was studied in three broad categories: demographics, maternal outcomes and neonatal outcomes. In what follows, the results in each category are presented, discussed and contrasted with earlier works from literature.

Table 1: Baseline Maternal Variables of Subjects Participated in this Study

Variable		Non-AMA Group < 35-year age (n = 60)	AMA Group > 35-year age (n = 60)	p-value
Age (years)		27 ± 8	40 ± 5	<0.05
BMI (kg/m^2)	Underweight (< 18.5)	2 (3.33)	3 (5)	<0.009
	Normal (18.5-24.9)	47 (78.33)	44 (73.33)	
	Overweight (25-29.9)	6 (10)	7 (11.67)	
	Obese (≥ 30)	5 (8.34)	6 (10)	
Thyroid Function	Normal	53 (88.33)	51 (85)	0.462
	Low	7 (11.67)	9 (15)	
Diabetes	Non-diabetic	55 (91.67)	53 (88.33)	<0.005
	DM I	1 (1.67)	2 (3.33)	
	DM II	4 (6.67)	5 (8.34)	
Chronic Hypertension		3 (5)	6 (10)	<0.004

Data presented as mean ± SD. Data are number (%).

The median ages were 27.4 years (range, 19-35) for the older women and 27 years (range, 17-34) for the younger women. According to BMI at the time of delivery, most women were overweight or obese: 83% and 70% in the study group and control group, respectively (Table 1).

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Table 2: Baseline Maternal Pregnancy Outcomes of Subjects Participated in this Study

Variable		Non-AMA Group < 35-year age (n = 60)	AMA Group > 35-year age (n = 60)	p-value
Gestational Diabetes		2 (3.33)	3 (5)	<0.07
Hypertensive disease of pregnancy	Gestational	2 (3.33)	3 (5)	
	Preeclampsia	2 (3.33)	4 (73.33)	<0.022
Antenatal complications	Abruption	1 (1.67)	2 (3.33)	
	Placenta previa	2 (3.33)	3 (15)	
	Oligohydramnios	1 (1.67)	1(1.67)	0.442
	Polyhydramnios	1 (1.67)	1 (1.67)	
Induced Labour		56	57 (10)	<0.003
Caesarean Delivery		2 (3.33)	2 (3.33)	0.062
Postpartum haemorrhage		1 (1.67)	1 (1.67)	<0.054

Data presented as mean ± SD. Data are number (%).

Only 7% of the women in the AMA group were pregnant for the first time while 41% of the younger group (i.e., Non-AMA Group), was pregnant for the first time. Type II diabetes, chronic hypertension, and hypothyroidism were more prevalent in the study group (Table 2).

Table 3: Multivariate logistic regression with gestational diabetes as the dependent variable (n=120)

Predictors	Unadjusted			Adjusted		
	Odds Ratio	p values	95% CI	Odds Ratio	p values	95% CI
Body Mass Index (kg/m^2)	2.4	0.001	1.6-2.9	1.7	0.003	1.2-2.4
Advanced maternal age	3.5	0.001	2.6-3.4	2.4	0.002	0.005

Data presented as mean ± SD. Data are number (%).

The factors associated with GDM were BMI more than 25 kg/m2. In other words, women aged 35 years or older with BMI ≥25 kg/m2 were 70% more likely to have GDM, and multiparous women of AMA during pregnancy were 80% more likely to have GDM (Table 3).

Discussion

The evaluation of the effects of advanced maternal age on pregnancy outcomes is of great importance due to the increasing trend of women delaying childbirth. This discussion aims to explore the findings and implications of studies examining the effects of advanced maternal age on various pregnancy outcomes.

Fertility and Conception: Advanced maternal age is associated with a decline in fertility due to factors such as decreased ovarian reserve and age-related changes in reproductive function. Women in their late 30s and 40s may experience reduced rates of natural conception and increased time to conception compared to younger women. Assisted reproductive technologies, such as IVF, have provided options for women of advanced age seeking pregnancy. However, success rates of ART decrease with advancing maternal age, primarily due to age-related declines in oocyte quality and embryo development. The evaluation of fertility and conception in advanced maternal age is crucial for managing expectations and providing appropriate counselling for women who are planning pregnancy [1-4].

Pregnancy complications: Advanced maternal age is associated with an increased risk of various pregnancy complications. Gestational diabetes mellitus (GDM) is more prevalent in older women, likely due to impaired glucose metabolism and insulin resistance associated with aging. Hypertensive disorders, including preeclampsia and gestational hypertension, are also more common in pregnancies of advanced maternal age, posing risks to both the mother and the baby [5-8]. Additionally, advanced age is associated with an increased risk of placental abnormalities, such as placenta previa and placental abruption, which can lead to adverse outcomes [9]. The evaluation of pregnancy complications in advanced maternal age helps in risk stratification and appropriate management during prenatal care.

Mode of delivery: The risk of caesarean section (C-section) delivery is higher in pregnancies of advanced maternal age compared to younger pregnancies. This increased risk may be attributed to various factors, including a higher incidence of foetal distress, malpresentation, and maternal comorbidities such as obesity and hypertensive disorders [10-14]. Additionally, women of advanced age may opt for planned C-sections due to concerns about potential risks during labour. However, the decision for mode of delivery should be based on individual factors and obstetric indications. The evaluation of the mode of delivery in advanced maternal age provides insights into obstetric management and potential interventions to optimize maternal and neonatal outcomes [15].

Neonatal Outcomes: Advanced maternal age is associated with an increased risk of adverse neonatal

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outcomes. Maternal age is a well-established risk factor for chromosomal abnormalities, particularly Down syndrome. The risk of other genetic abnormalities, such as trisomy 18 and trisomy 13, also increases with maternal age. Additionally, pregnancies of advanced maternal age have higher rates of preterm birth, low birth weight, and stillbirth. These adverse outcomes may be partially explained by the higher prevalence of pregnancy complications in older women. Evaluating neonatal outcomes in advanced maternal age is essential for appropriate antenatal counseling, screening, and interventions to optimize neonatal health [14-16].

Long-Term Maternal and Child Health: Pregnancy at an advanced age can have long-term health implications for both the mother and the child. Women who have pregnancies at older ages may have an increased risk of developing cardiovascular disease, metabolic disorders, and certain cancers later in life. Offspring born to older mothers may face higher risks of genetic disorders, developmental delays, and chronic health conditions [15-18]. However, it is important to note that the absolute risks of these outcomes remain relatively low. The evaluation of long-term maternal and child health outcomes in advanced maternal age provides insights into potential health risks and can guide healthcare providers in offering appropriate surveillance and follow-up care.

The evaluation of the effects of advanced maternal age on pregnancy outcomes highlights the increased risks and challenges faced by women who delay childbirth. Advanced maternal age is associated with fertility decline, increased risk of pregnancy complications, higher rates of C-section delivery, adverse neonatal outcomes, and potential long-term health implications for both the mother and the child. Understanding these associations is crucial for healthcare providers to offer appropriate counselling, prenatal care, and interventions to optimize pregnancy outcomes. By identifying and managing potential risks, healthcare professionals can improve the overall well-being of women of advanced maternal age and their offspring, ensuring the best possible outcomes for both.

Conclusions

The evaluation of the effects of advanced maternal age on pregnancy outcomes has provided valuable insights into the unique challenges and risks faced by women who delay childbirth.

The evaluation of the effects of advanced maternal age on pregnancy outcomes highlights the increased risks and challenges faced by women who delay childbirth. Understanding these associations is crucial for healthcare providers in offering appropriate counselling, prenatal care, and interventions to optimize pregnancy outcomes.

By identifying and managing potential risks, healthcare professionals can improve the overall well-being of women of advanced maternal age and their offspring, ensuring the best possible outcomes for both.

Additionally, public health policies and guidelines should consider the unique needs of women of advanced age to provide targeted support and promote healthy pregnancies in this population.

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