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Original Research Article

Obstetric Outcome of Advanced Maternal Age in Women Presenting to a Tertiary Care Hospital

Karishma Alam*, Lubna Bibi, Laila Irshad, Alveena Ayub, Huma Ali

Department of Obstetrics & Gynaecology, Hayatabad Medical Complex, Peshawar, Pakistan
**Corresponding author`s email address:* Krshalam92@gmail.com

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Abstract: *Advanced maternal age (AMA), commonly defined as pregnancy at 35 years or older, is associated with increased maternal and perinatal complications. Women of advanced age are at higher risk of obstetric comorbidities such as gestational diabetes mellitus and pre-eclampsia, which may influence delivery outcomes, particularly the rate of caesarean section.* ***Objective:*** *To determine obstetric outcomes in women of advanced maternal age presenting to a tertiary care hospital.* ***Methods:*** *This cross-sectional study included 69 women aged 35–50 years with singleton pregnancies. Women with multiple gestations, previous caesarean section, immune disorders, and known fetal chromosomal abnormalities (microdeletions or aneuploidies) were excluded. Data were collected on maternal comorbidities, including gestational diabetes mellitus, pre-eclampsia, anaemia, and fetal distress. Obstetric outcome was assessed in terms of mode of delivery, particularly caesarean section. Data analysis was performed using SPSS version 25. Associations were evaluated using appropriate statistical tests, with a p-value <0.05 considered statistically significant.* ***Results:*** *The mean maternal age was 43.67 ± 3.92 years, and the mean body mass index was 25.9 ± 1.1 kg/m². Gestational diabetes mellitus was present in 29.0% of patients, while 20.3% developed pre-eclampsia. Caesarean section was performed in 43.5% of cases. A statistically significant association was observed between caesarean delivery and the presence of gestational diabetes and pre-eclampsia (p < 0.05).* ***Conclusion:*** *Advanced maternal age was associated with a high rate of caesarean section (43.5%). The likelihood of operative delivery was significantly increased in women with gestational diabetes mellitus and pre-eclampsia. Enhanced antenatal surveillance and early identification of high-risk conditions may improve obstetric outcomes in this population.*

Keywords: Obstetric Outcome, Advanced Maternal Age, Caesarean Section, Fertility

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Introduction

The phenomenon of advanced maternal age (AMA) has become increasingly relevant in obstetric practice. Delayed childbearing is the outcome of complex socio-economic and educational factors, as well as evolving social norms, which can afford women greater independence over reproductive timing. Such demographic change is seen worldwide with a noticeable rise in births among older women during the past few decades, encouraging intense clinical and public health scrutiny into related obstetric outcomes. Advanced maternal age is no longer considered an outlier but a common clinical scenario in both high- and low-income settings (1-3). AMA is associated with the increased incidence of GDM as well as hypertensive disorders such as pre-eclampsia, i.e., represent noteworthy contributors to the maternal morbidity as well as mortality globally. Such conditions occur more frequently among older mothers. They can precipitate the interventions, including the labour induction as well as caesarean delivery, thus modifying the natural course of birth. Studies have demonstrated that older women are more likely to progress with gestational hypertension and GDM in comparison with younger women (5, 6).

Preterm birth, stillbirth, and increased NICU admissions are prevalent among older women. Such neonatal sequelae lead to long-term health consequences for newborns that extend beyond the early perinatal period. Emerging empirical research reported similar patterns, as reports showed that significantly greater rates of C-section, GDM, pre-eclampsia, and preterm birth among women with AMA in comparison to the younger women, highlighting that AMA is a noteworthy risk factor within the obstetric practice (7-10). Management of AMA pregnancies is thus nuanced, requiring early identification of risk factors and multidisciplinary care. Monitoring for GDM as well as hypertensive disorders forms a vital part of contemporary obstetric care. Preconception counselling that addresses the modifiable factors may mitigate some risks related to AMA pregnancies, though evidence related to the efficacy of precise interventions remains a developing research frontier (11, 12).

The rationale for examining the obstetric outcomes of advanced maternal age in women lies in the rapidly increasing trend of delayed childbearing worldwide and its significant implications for maternal and perinatal health. AMA is associated with a greater likelihood of fetomaternal complications. Understanding the specific patterns and magnitudes of such factors across different populations is thus essential for developing targeted preventive strategies, optimising clinical management, and guiding evidence-based counselling for women who plan pregnancy at a later age.

Methodology

A total of 215 pregnant women with severe pre-eclampsia delivered. This cross-sectional study was conducted in the Obstetrics and Gynaecology department of Hayatabad Medical Complex, Peshawar, after taking ethical approval from the review board. The study was conducted from 29-09-2023 to 29-03-2024. Sixty-nine patients were selected for this study; the sample size was calculated as 69 using the World Health Organization sample size calculator with a 95% confidence level, an absolute precision of 11.5%, and an anticipated caesarean section rate of 61.9%, based on a previous study.[13] Non-probability consecutive sampling was used.

Pregnant women presenting with advanced maternal age, 35 to 50 years, with a singleton pregnancy were included. Women with multiple pregnancies, a history of previous caesarean section, immune diseases, and microdeletions or aneuploidies were excluded.

All pregnant women were informed about the purpose, benefits, and risks of this research, and written informed consent was obtained from all patients. Demographic information was documented. A comprehensive medical history was taken, and a physical examination was performed.

All the advanced maternal age pregnant women were assessed for the presence of antenatal comorbidities like gestational diabetes, pre-eclampsia, and anaemia. Patients were assessed for obstetric outcome such as C-section, defined as a surgical intervention for fetus delivery, that involves an incision made through the wall of the abdominal and uterus. All patient assessments were performed under the supervision of a consultant with at least 5 years of post-fellowship experience. Observations for each patient were recorded on a predefined pro forma.

The collected data were analyzed with SPSS 25. Mean and standard deviation were calculated for age, weight, height, and BMI. Frequencies and percentages were calculated for obstetric outcome (caesarean section), gestational diabetes, pre-eclampsia, anaemia, and fetal distress. Effect modifiers like age, BMI, gestational diabetes, pre-eclampsia, fetal distress, and anemia were controlled through stratification. A post-stratification chi-square test was applied at the 5% significance level. Results were presented in tables.

Results

This study analyzed 69 pregnant women of advanced maternal age; their mean age was 43.7 ± 3.9 years, and their mean body mass index was 25.9 ± 1.1 kg/m². The prevalence of antenatal complications included gestational diabetes, which was diagnosed in 29.0% patients (n=20; 95% CI: 0.19-0.40). Pre-eclampsia was observed in 20.3% (n=14; 95% CI: 0.12-0.30). Antepartum anaemia and fetal distress occurred in 14.5% (n=10; 0.07-0.24) and 10.1% of cases (n=7; 95% CI: 0.04-0.18), respectively (Table 1).

The rate of caesarean section delivery, which was the obstetric outcome in this study, was 43.5% (n = 30; 95% CI: 0.32-0.55) (Table 2).

Analysis of factors associated with caesarean delivery showed several significant relationships. The presence of gestational diabetes was associated with C-section. Among women who underwent caesarean section, 43.3% (n=13) had gestational diabetes (p=0.02). Pre-eclampsia was present in 36.7% (n=11) of caesarean deliveries (p=0.003). Anemia was not associated with C-section. Fetal distress occurred in 7 cases, of which 5 were in the c-section group, but it did not reach statistical significance (Table 3).

Table 1: Comorbidities and complications

Comorbidities & complications		N	%	95% CI	
				Lower	Upper
Gestation diabetes	Yes	20	29.0%	0.19	0.40
	No	49	71.0%		
Pre-eclampsia	Yes	14	20.3%	0.12	0.30
	No	55	79.7%		
Anemia	Yes	10	14.5%	0.07	0.24
	No	59	85.5%		
Fetal distress	Yes	7	10.1%	0.04	0.18
	No	62	89.9%		

Table 2: Frequency of obstetric outcome

Obstetric outcome (C-section)	n	%	95% CI	
			Lower	Upper
Yes	30	43.5%	0.32	0.55
No	39	56.5%		

Table 3: Stratification of obstetric outcome with different parameters

Parameters		Obstetric outcome (C-section)				P value
		Yes		No		
		n	%	n	%	
Age distribution (Years)	35 to 42	13	43.3%	13	33.3%	0.39
	> 42	17	56.7%	26	66.7%	
BMI (Kg/m²)	18 to 24.9	6	20.0%	8	20.5%	0.95
	> 24.9	24	80.0%	31	79.5%	
Gestation diabetes	Yes	13	43.3%	7	17.9%	0.02
	No	17	56.7%	32	82.1%	
Pre-eclampsia	Yes	11	36.7%	3	7.7%	0.003
	No	19	63.3%	36	92.3%	
Anemia	Yes	6	20.0%	4	10.3%	0.25
	No	24	80.0%	35	89.7%	
Fetal distress	Yes	5	16.7%	2	5.1%	0.11
	No	25	83.3%	37	94.9%	

Discussion

Advanced maternal age represents a significant obstetric challenge, with a well-documented association with increased maternal and perinatal morbidity. The collective evidence from studies underscores this consistent theme. An Indonesian study of 6,763 deliveries confirmed that pregnancies in women over 35 years of age were at significantly higher risk for specific adverse outcomes, such as antepartum haemorrhage, hypertensive disorders, and intrauterine fetal demise. However, the caesarean delivery rate did not differ significantly from that of younger controls (14). This suggests that, while certain complications are age-dependent, the decision to deliver surgically may be moderated by local practice. Research from Eastern Europe further improves this risk profile by indicating that for nulliparous women of advanced age, the mode of conception influences outcomes. Those achieving pregnancy through assisted reproductive technology faced substantially higher odds of caesarean section, operative vaginal delivery, and massive haemorrhage compared to the spontaneously conceiving cohort, highlighting infertility-related pathologies and perhaps a lower intervention threshold for precious pregnancies (15).

Another study reported that risks for preterm birth, very low birth weight, and caesarean delivery increased progressively from the control group to the advanced (35-39 years) and very advanced (≥40 years) age categories (16). Studies from India, while observing higher rates of diabetes, hypertension, and caesarean section in older patients, concluded that with frequent antenatal care, favourable perinatal outcomes can be achieved (13, 17). These studies showed that advanced maternal age is a complex risk factor, with outcomes shaped by a confluence of biological ageing, pre-existing gynecological history, specific comorbidities, and prevailing clinical management.

In the present study, the mean age was 43.7 years; this demographic characteristic alone suggests a population at the upper extremity of obstetric risk. The observed caesarean section rate of 43.5% aligns with the upper range reported in literature for this age group. It is consistent with the escalated risk associated with very advanced age documented by Diabelkova et al. (16). The prevalence of antenatal comorbidities in this cohort was considerable. Gestational diabetes occurred in 29.0% patients,

which is higher than the reported incidences of GDM in older women and underscores the pronounced metabolic vulnerability associated with later childbearing (3, 16). The 20.3% incidence of pre-eclampsia confirms the relation between advanced maternal age and endothelial dysfunction (14). The analysis of determinants for caesarean delivery in this cohort exhibited critical insights. The statistically significant association between gestational diabetes and caesarean section, with the condition present in 43.3% of c-section deliveries, quantifies a key clinical pathway. This association is more likely due to mechanisms such as fetal macrosomia, polyhydramnios and an increased risk of labor abnormalities, leading to surgical intervention. Pre-eclampsia was also more common in the c-section group. Pre-eclampsia often leads to c-section for maternal or fetal indications, frequently before the onset of labour or in the context of unfavorable cervical status, making caesarean section the safest option (14). The present analysis did not demonstrate a statistically significant difference in caesarean rates between the 35-42 and >42-year age groups. The lack of significant association with BMI or anaemia indicates that in this population of older mothers, these factors may not be primary drivers of the decision for c-section.

Several limitations of this study must be acknowledged. The small sample size of 69 patients limits the statistical power to detect more subtle associations, explaining the non-significant findings for factors such as fetal distress. The single-centre cross-sectional design limits generalisability, as practice patterns can vary widely across institutions and for different patient presentations. The absence of data on important confounders, such as parity, and the lack of precise indications for c-section, whether elective or emergency, limit interpretation. Future studies with larger, multi-centre, prospective designs that capture detailed intrapartum data and long-term neonatal outcomes would be valuable for validating these observations.

Conclusion

In conclusion, the present study demonstrated that in advanced maternal age, the frequency of obstetric outcome in terms of c-section was moderately higher, as 43.5% women delivered through c-section. This obstetric outcome was significantly associated with gestational diabetes and pre-eclampsia. Enhanced prenatal focus on managing these specific conditions could help reduce c-section delivery rates in this population.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-HMCP-032/24)

Consent for publication

Approved

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Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

KA (Postgraduate Resident), LB (Postgraduate Resident)
Contributed to study design, data collection, and initial manuscript drafting
Assisted in data acquisition, literature review, and manuscript editing
Performed statistical analysis and contributed to the interpretation of results
Helped in methodology Development, data organization, and manuscript formatting

***LI (Postgraduate Resident), AA (Postgraduate Resident), HA (Postgraduate Resident*)**
Contributed to patient recruitment, data entry, and results compilation
Assisted in referencing, proofreading, and final revisions of the manuscript
Guided study execution and critically reviewed the manuscript
Supervised the research, coordinated among authors, finalized the manuscript, and approved the final version

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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