International Journal of Medical Sciences And Clinical Research

VOLUME Vol.06 Issue04 2026
PAGE NO. 133-141
DOI 10.37547/ijmscr/Volume06Issue04-25

# Effect of Advanced Maternal Age on Pregnancy Outcome

Huda Khalid Jasim
MBChB. Basrah Health Directorate

Faiz Al Waeely
Consultant of Obstetrics and Gynaecology. College of Medicine / University of Basrah

**Received:** 18 March 2026; **Accepted:** 04 April 2026; **Published:** 30 April 2026

**Abstract:** Background: Female oocyte count peaks in utero then declines, accelerating after age 32. Advanced maternal age (≥35) pregnancies are rising globally due to sociocultural factors. While advanced maternal age increases maternal-foetal risks, outcomes vary—worsened in low-resource settings, but improved in high-income countries through advanced screening, individualized care, and assisted reproductive technologies.

Objectives: To study the effect of advanced maternal age (AMA) on maternal and neonatal outcomes.

Methods: A case-control study was conducted in the obstetric department of Al-Mawane Teaching Hospital in Basra City/Iraq, during the period from 1st of October 2024 to 1st of September 2025. Data collection covered demographics, obstetric/medical history, pregnancy complications, delivery mode, postpartum outcomes, neonatal complications, and hospital stay length.

Results: This study compared 50 advanced maternal age women (≥35 years) with 50 controls (18–35 years). Groups were demographically similar, except for age. Women of advanced maternal age had significantly fewer regular antenatal visits (p=0.003), more chronic illness (p=0.005), and higher pregnancy complications (p=0.011). They experienced more caesarean deliveries (p=0.050), preterm births (p=0.035), postpartum haemorrhage (p=0.014), exploratory laparotomy/hysterectomy (p=0.039), and longer hospital stays (p=0.001). Neonates of advanced maternal age mothers showed higher risks of low 5-minute Apgar (p=0.050), large for gestational age (p=0.012), hypoglycaemia (p=0.006), and neonatal intensive care unit admission (p=0.028).

Conclusions: Advanced maternal age increases maternal and neonatal risks, including chronic illness, pregnancy complications, caesarean delivery, postpartum morbidity, and adverse neonatal outcomes, while reduced antenatal care may worsen outcomes compared to younger women.

**Keywords:** Advanced Maternal Age, Pregnancy, Outcomes, Basrah.

**Introduction:** The quantity of oocytes in females is limited at birth. Unlike their male counterparts, females probably do not produce new gametes during the course of their lives. At around 20 weeks of gestation, the number of oocytes in the womb peaks, and then steadily declines until about age 32. Oocyte counts decline more quickly at this age until age 37, at which point they decline even more sharply (1).

The prevalence of pregnancies in women of advanced maternal age (AMA), typically defined as 35 years and older, has been steadily increasing worldwide. This trend is largely attributed to sociocultural and economic factors, such as delayed childbearing due to educational and career advancement, improved access to contraceptive methods, and the availability of assisted reproductive technologies (ART). According to recent demographic data, the proportion of first-time mothers aged 35 years and above has more than doubled over the past few decades in high-income countries (2).

According to data from the Organisation for Economic Cooperation and Development, the majority of women in wealthy nations give birth for the first time at the age of thirty, which has increased by around five years

worldwide over the last 20 years (3).

Despite the increasing frequency of AMA pregnancies, they are associated with heightened risks for both maternal and foetal complications. (4)

The primary underlying reason is the decline in both the amount and quality of oocytes with increasing age. Changes in the ovulatory cycle, exposure to environmental contaminants, a possible deterioration in uterine health, and an elevated risk of pregnancy problems and miscarriage are other variables (5). accompanied by higher rates of chromosomal abnormalities and aneuploidy (6). Consequently, AMA has been strongly linked to infertility, early miscarriage, and adverse pregnancy outcomes (6).

Women of AMA face an elevated risk of several obstetric and medical complications, including hypertensive disorders of pregnancy (7), gestational diabetes mellitus (8), placental abnormalities (9), and preterm birth (10). These risks extend to labour and delivery, with higher rates of caesarean section (11), postpartum haemorrhage (12), and venous thromboembolism (13). Moreover, pregnancies at advanced maternal age are associated with foetal complications such as chromosomal abnormalities (14), intrauterine growth restriction (15), macrosomia (16), congenital anomalies (17), and increased rates of neonatal intensive care admission (18).

The impact of AMA on pregnancy outcomes is also influenced by disparities in healthcare access and quality. In low- and middle-income countries, where prenatal care may be less accessible, the risks associated with AMA pregnancies are often exacerbated by undiagnosed or poorly managed pre-existing medical conditions. Conversely, in high-resource settings, advancements in maternal-foetal medicine, early screening programs, and individualized care plans have contributed to improved pregnancy outcomes among older mothers (4).

**Aim of the study**

To study the effect of advanced maternal age (AMA) on maternal and neonatal outcomes.

**PATIENTS AND METHODS**

A case-control study was conducted in the obstetric department of Al-Mawane Teaching Hospital in Basra City/Iraq, during the period from 1st of October 2024 to 1st of September 2025. To study the effect of advanced maternal age (AMA) on maternal and neonatal outcomes. Women who visited the Obstetric Department of Al-Mawanee Teaching Hospital for delivery during the study period were included in the study. And divided into two groups: Group 1: fifty women who were aged 35 years or older at the time of delivery. Group 2: fifty women who were aged between 18 and 35 years old at the time of delivery. Women in the two groups were matched for parity. The women with Multiple pregnancies, and Women with pre-existing medical conditions (e.g., diabetes, hypertension) who were diagnosed before pregnancy were excluded from the study. The data was collected from women who were included in the study through a well-formed questionnaire developed for the study. They were asked about: The demographic history: Age, occupation, socio-economic status, residency and educational level. The Obstetric history: Gravidity, parity, abortions, prior pregnancy outcomes. Any Previous pre-term labor, previous caesarean delivery, history of infertility treatment, mode of conception in the current pregnancy, whether assisted or natural, Any Complications during this pregnancy, and the frequency of ANC. And gestational age at delivery (weeks) according to the LMP.

Then, Past Medical history, Pre-pregnancy medical conditions (e.g., diabetes, hypertension, thyroid disorders). The women underwent a full general and obstetric examination; the vital signs were recorded. The Mode of delivery: if it's vaginal delivery, or caesarean section (elective or emergency). The woman and baby were followed up after delivery for any of the following complications: PROM, Chorioamnionitis, Retained placenta/placental fragments, Severe perineal tear grade ¾, Placental abruption, Postpartum haemorrhage, Blood product transfusion, Maternal intensive care unit (ICU) admission, Prolonged hospitalization (≥7 days after a caesarean; ≥5 days after vaginal delivery), Puerperal fever, Uterine rupture, Explorative laparotomy, and hysterectomy, Intrapartum intra-uterine fetal death (IUFD), Shoulder dystocia, 5 min Apgar score <7, Small for gestational age (SGA), Large for gestational age (LGA), Congenital malformations, Neonatal asphyxia, Meconium aspiration, Jaundice, Transient tachypnea of the newborn, Brachial plexus injury, Mechanical ventilation, Convulsions, Hypoglycemia, Sepsis encephalopathy, Intracranial hemorrhage (ICH), and Neonatal ICU admission and The length of hospital stay in days was also recorded. The study received approval from the Ethics Committee of the Faculty of Medicine at Basrah University. Informed consent was obtained from all participants, and data confidentiality was carefully maintained.

Data entry and analysis were conducted using the Statistical Package for Social Sciences (SPSS), version 26. Quantitative data were expressed as mean ± standard deviation, while qualitative data were summarized as frequencies and percentages. A significance level (p-value) of ≤ 0.05 was considered for

all analyses, with results presented in tables and/or graphs.

**RESULTS**

The study included 100 women, divided into 50 women older than 35 and 50 women in the control group. The mean age in the control group was 24.16 ± 5.44 years, while in the Advanced Maternal Age (AMA) group it was significantly higher at 40.74 ± 3.82 years. Regarding educational status, 24% of women in the control group were illiterate compared to 36% in the AMA group. Primary education was reported by 36% in the control group and 32% in the AMA group. Secondary education was held by 34% in the control group and 32% in the AMA group. In terms of occupation, the vast majority of both groups were housewives—94% in the control group and 100% in the AMA group. Employment was slightly more common in the control group (6%) than in the AMA group (0%). Residency was similar between groups: 38% rural and 62% urban in the control group, and 40% rural and 60% urban in the AMA group.

There was a highly significant difference in age between groups (p = 0.001), as expected. However, there were no statistically significant differences in educational level (p = 0.226), occupation (p = 0.241), or residency (p = 0.964), indicating that the two groups were similar demographically, apart from age. As shown in Table 3.1.

**Table 3.1: Sociodemographic Characteristics of the Study Groups (Advanced Maternal Age vs. Control Group)**

| Variables | | Advanced maternal age (AMA) group (n= 50) | Control group (n= 50) | P- value |
|---|---|---|---|---|
| **Age** | **Mean± SD** | 40.74± 3.82 | 24.16± 5.44 | 0.001 |
| **Educational level** | **Illetrate** | 18 (36.0) | 12 (24.0) | 0.226 |
| | **Primary** | 16 (32.0) | 18 (36.0) | |
| | **Secondary** | 16 (32.0) | 17 (34.0) | |
| | **College and higher** | 0 (0.0) | 3 (6.0) | |
| **Occupation** | **Housewives** | 50 (100.0) | 47 (94.0) | 0.241 |
| | **Employed** | 0 (0.0) | 3 (6.0) | |
| **Residency** | **Rural** | 20 (40.0) | 19(38.0) | 0.964 |
| | **Urban** | 30 (60.0) | 31 (64.0) | |

Table 3.2 shows the Obstetric History and Fertility Characteristics. Nulliparity was observed in 16% of the control group and 12% of the AMA group. Most women in both groups had 1–4 previous deliveries: 68% in both. Grand multiparity (≥5) was slightly more common in the AMA group (20%) compared to the control group (16%). A history of miscarriage was reported by 30% of the control group and 50% of the AMA group. Among those with a miscarriage history, one miscarriage was reported in 80% of controls and 76% of AMA cases, two in 13.3% and 20% respectively, and three in 6.7% and 4%. Previous preterm labor occurred in 4% of control women and 6% of AMA women. Prior caesarean section was more frequent in the AMA group (28%) compared to 18% in controls. The history of infertility treatment was reported in 4% of controls and 2% of AMA participants. Almost all women in both groups conceived naturally (98%), and only 2% used assisted reproduction in both groups. There were no statistically significant differences in parity (p = 0.776), number of miscarriages (p = 0.823), previous preterm labor (p = 0.645), previous caesarean section (p = 0.235), infertility treatment (p = 0.554), or mode of conception (p = 1.000). However, the history of miscarriage showed borderline statistical significance (p = 0.050).

**Table 3.2: Obstetric History and Fertility Characteristics among Study Participants**

| Variables | | Advanced Maternal Age (AMA) group (n=50) | Control group (n=50) | p-value |
|---|---|---|---|---|
| **Parity** | **Nullipara** | 6 (12.0) | 8 (16.0) | 0.776 |
| | **1-4** | 34 (68.0) | 34 (68.0) | |
| | **≥ 5** | 10 (20.0) | 8 (16.0) | |
| **History of miscarriage** | **Yes** | 25 (50.0) | 15 (30.0) | 0.050 |
| **Number** | **1** | 19 (76.0) | 12 (80.0) | 0.823 |
| | **2** | 5 (20.0) | 2 (13.3) | |
| | **3** | 1 (4.0) | 1 (6.7) | |
| **Previous preterm labor** | | 3 (6.0) | 2 (4.0) | 0.645 |
| **Previous CS** | | 14 (28.0) | 9 (18.0) | 0.235 |
| **History of infertility treatment** | | 1 (2.0) | 2 (4.0) | 0.554 |
| **Mode of conception** | **Natural** | 49 (98.0) | 49 (98.0) | 1.000 |
| | **Assisted** | 1 (2.0) | 1 (2.0) | |

Table 3.3 shows the Antenatal Care, Chronic Illnesses, and Pregnancy Complications. Regular antenatal care was significantly more common in the control group (26%) compared to only 2% in the AMA group. Chronic illness was present in 6% of controls and 20% of the AMA group. Specifically, diabetes mellitus was reported in 2% of controls and 4% of AMA, hypertension in 2% of controls and 12.5% of AMA women, and thyroid disorders in 2% and 4%, respectively. Pregnancy complications were reported by 36% of the control group and 70% of the AMA group. Gestational diabetes occurred in 6% of control and 26% of AMA pregnancies. Gestational hypertension affected 28% of controls and 42% of AMA participants, while preeclampsia occurred equally in 2% of both groups.

There were statistically significant differences in antenatal care regularity (p = 0.003), chronic illness prevalence (p = 0.005), and pregnancy complications (p = 0.011), indicating that women of advanced maternal age were less likely to receive regular prenatal care and more likely to experience chronic conditions and complications during pregnancy.

**Table 3.3: Antenatal Care, Chronic Illnesses, and Pregnancy Complications in Both Groups**

| Variables | | Advanced Maternal Age (AMA) group (no =50) | Control group (no =50) | p-value |
|---|---|---|---|---|
| **ANC** | **Regular** | 1 (2.0) | 13 (26.0) | 0.003 |
| | **Irregular** | 46 (92.0) | 35 (70.0) | |
| | **None** | 3 (6.0) | 2 (4.0) | |

| | | | | |
|---|---|---|---|---|
| **Chronic illness** | **Present** | 10 (20.0) | 3 (6.0) | 0.005 |
| | **DM** | 2 (4.0) | 1 (2.0) | |
| | **HTN** | 6 (12.5) | 1 (2.0) | |
| | **Thyroid disorder** | 2 (4.0) | 1 (2.0) | |
| **Pregnancy complication** | **Present** | 35 (70.0) | 18 (36.0) | 0.011 |
| | **Gestational diabetes** | 13 (26.0) | 3 (6.0) | |
| | **Gestational HTN** | 21 (42.0) | 14 (28.0) | |
| | **PE** | 1 (2.0) | 1 (2.0) | |

Table 3.4 shows the mode and timing of Delivery. Normal vaginal delivery occurred in 64% of the control group but only 42% of the AMA group. In contrast, caesarean sections were more frequent among AMA women (58%) compared to the control group (36%). The mean gestational age at delivery was slightly higher in the AMA group (38.45 ± 1.86 weeks) than in the control group (37.96 ± 2.09 weeks). Preterm birth was more common in AMA pregnancies (34%) compared to 14% in controls. Term delivery occurred in 86% of control cases and 66% of AMA cases.

There was a statistically significant difference in the mode of delivery (p = 0.050) and preterm delivery rates (p = 0.035), with AMA women more likely to undergo caesarean section and deliver prematurely. The difference in gestational age was not statistically significant (p = 0.233), although the higher rate of preterm births in the AMA group indicates a clinical concern.

**Table 3.4: Mode and Timing of Delivery among Women with Advanced Maternal Age and Controls**

| **Variables** | | **Advanced Maternal Age (AMA) group (n=50)** | **Control group (n=50)** | **p-value** |
|---|---|---|---|---|
| **Mode of delivery** | **Normal vaginal delivery** | 21 (42.0) | 32 (64.0) | 0.050 |
| | **Caesarean section** | 29 (58.0) | 18 (36.0) | |
| **Gestational age at delivery (weeks)** | | 38.45± 1.86 | 37.96± 2.09 | 0.233 |
| | **Preterm** | 17 (34.0) | 7 (14.0) | 0.035 |
| | **Term** | 33 (66.0) | 43 (86.0) | |

Table 3.5 shows Maternal Complications during Labor and Postpartum. Premature rupture of membranes (PROM) was reported in 4% of AMA cases and none of the control group. Placental abruption occurred in 12%

of controls and 4% of AMA participants. Postpartum hemorrhage (PPH) was more frequent in the AMA group (20%) compared to the control group (4%). Blood transfusions were required in 14% of AMA cases and 4% of control cases. ICU admissions were recorded for 6% of AMA and 2% of control participants. Prolonged hospital stay occurred in 4% of AMA women and none in the control group. Uterine rupture and exploratory laparotomy/hysterectomy were observed in 4–6% of AMA cases, with no such incidents in the control group. The mean hospital stay was significantly longer in the AMA group (1.88 ± 0.2 days) compared to the control group (0.98 ± 0.14 days).

Significant differences were found for PPH (p = 0.014), exploratory laparotomy/hysterectomy (p = 0.039), and length of hospital stay (p = 0.001), indicating that AMA women faced more severe maternal complications during and after labor. Other variables such as PROM, ICU admission, and blood transfusion, did not reach statistical significance.

**Table 3.5: Maternal Complications during Labor and the Postpartum Period**

| Variables | Advanced Maternal Age (AMA) group (n=50) | Control group (n=50) | p-value |
|---|---|---|---|
| **PROM** | 2 (4.0) | 0 (0.0) | 0.495 |
| **Placental abruption** | 2 (4.0) | 6 (12.0) | 0.140 |
| **PPH** | 10 (20.0) | 2 (4.0) | 0.014 |
| **Blood transfusion** | 7 (14.0) | 2 (4.0) | 0.081 |
| **ICU admission** | 3 (6.0) | 1 (2.0) | 0.307 |
| **Prolonged hospitalization (≥7 days after a caesarean; ≥5 days after vaginal delivery)** | 2 (4.0) | 0 (0.0) | 0.153 |
| **Uterine rupture** | 2 (4.0) | 0 (0.0) | 0.153 |
| **Exploratory laparotomy/hysterectomy** | 3 (6.0) | 0 (0.0) | 0.039 |
| **Hospital stay (days)** | 1.88± 0.2 | 0.98± 0.14 | 0.001 |

Table 3.6 shows the Neonatal Outcomes. A 5-minute Apgar score below 7 was observed in 10% of neonates born to AMA mothers, while none in the control group had this outcome. Large for gestational age (LGA) infants were more frequent in the AMA group (12%) than in controls (0%). Congenital malformations and jaundice were each reported in 6% of AMA newborns and 2% of controls. Neonatal hypoglycemia was much more frequent in the AMA group (20%) compared to 2% in the control group. Intraventricular hemorrhage (ICH) occurred in 2% of AMA cases only. NICU admissions were significantly more common among neonates born to AMA mothers (24%) compared to 6% in controls. Significant differences were found in 5-minute Apgar score <7 (p = 0.050), LGA (p = 0.012), hypoglycemia (p = 0.006), and NICU admission (p = 0.028), suggesting that AMA is associated with poorer neonatal outcomes. Other conditions, such as malformations, jaundice, and ICH, were more frequent in the AMA group but did not reach statistical significance.

**Table 3.6: Neonatal Outcomes in Relation to Maternal Age**

| Variables | Advanced Maternal Age (AMA) group (n=50) | Control group (n=50) | p-value |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **5 min Apgar score <7** | 5 (10.0) | 0 (0.0) | 0.05 |
| **Large for gestational age (LGA)** | 6 (12.0) | 0 (0.0) | 0.012 |
| **Congenital malformations** | 3 (6.0) | 1 (2.0) | 0.307 |
| **Jaundice** | 3 (6.0) | 1 (2.0) | 0.315 |
| **Hypoglycemia** | 10 (20.0) | 1 (2.0) | 0.006 |
| **ICH** | 1 (2.0) | 0 (0.0) | 0.315 |
| **NICU admission** | 12 (24.0) | 3 (6.0) | 0.028 |

## DISCUSSION

Advanced maternal age (AMA), commonly defined as pregnancy at 35 years or older, has increasingly become a global concern due to the rising trend of delayed childbearing (2). This demographic shift is influenced by socioeconomic changes, career priorities, and advances in assisted reproductive technologies (ART), allowing women to conceive later in life (19). Despite these societal benefits, AMA is consistently associated with an elevated risk of maternal and neonatal complications, making it a crucial area for obstetric research (4). Studying its impact in Iraq is particularly important, as regional cultural, social, and healthcare factors may influence outcomes differently from those reported in high-income countries.

As anticipated, age differed significantly between groups (mean 40.7 vs. 24.1 years, p=0.001). However, other sociodemographic factors such as education, occupation, and residency were not significantly different, suggesting effective group matching. Notably, illiteracy was slightly more common in the AMA group (36% vs. 24%). Previous studies by Sarikhani et al. (2024) and Hunde et al. (2023) in low- and middle-income countries have shown that lower educational attainment is associated with delayed healthcare-seeking behaviour and adverse maternal outcomes (20, 21). Nevertheless, in our cohort, the similarity in educational and occupational profiles suggests that age itself, rather than socioeconomic disparity, was the primary differentiating factor.

Both groups showed comparable parity distributions, although grand multiparity was slightly higher among AMA women (20% vs. 16%). Importantly, the history of miscarriage was more frequent in the AMA group (50% vs. 30%, p=0.050). This aligns with the well-documented association between increasing maternal age and higher miscarriage risk due to chromosomal abnormalities, diminished oocyte quality, and uterine factors as reported by Magnus et al. (2019) (22). Our findings also reflect those from a Middle Eastern cohort in which miscarriage rates were nearly double among AMA women compared to younger mothers (23).

Regular antenatal care was significantly less common in AMA women (2% vs. 26%, p=0.003). This is concerning, as inadequate antenatal visits are known to exacerbate pregnancy risks, particularly in high-risk populations such as AMA (24). Chronic illnesses were also more prevalent in AMA (20% vs. 6%, p=0.005), with hypertension being the most notable. Similar patterns have been observed globally, with AMA women at greater risk of developing metabolic and vascular disorders due to age-related physiological decline (25).

Pregnancy complications were significantly more frequent in AMA (70% vs. 36%, p=0.011). Gestational diabetes (26% vs. 6%) and gestational hypertension (42% vs. 28%) were markedly elevated in AMA. These findings are consistent with large epidemiological studies showing a strong age-related gradient in pregnancy complications, largely attributed to endothelial dysfunction, increased insulin resistance, and placental changes in older mothers (26, 27). Our results revealed that AMA women were significantly more likely to undergo caesarean delivery (58% vs. 36%, p=0.050) and to deliver preterm (34% vs. 14%, p=0.035). Similar findings have been reported worldwide, where AMA is an independent predictor of operative delivery due to higher obstetric risk perception, cephalopelvic disproportion, and physician preference (28).

Significant maternal morbidity was observed in the AMA group. Postpartum haemorrhage (20% vs. 4%, p=0.014) and exploratory laparotomy/hysterectomy (6% vs. 0%, p=0.039) were notably higher, alongside longer hospital stays (1.9 vs. 1.0 days, p=0.001). These

findings are consistent with prior literature by Ende et al. (2021) suggesting that AMA increases the risk of uterine atony, abnormal placentation, and operative complications (29).

Neonatal complications were also more prevalent in AMA pregnancies. Apgar scores <7 at 5 minutes (10% vs. 0%, p=0.050), hypoglycaemia (20% vs. 2%, p=0.006), large-for-gestational-age infants (12% vs. 0%, p=0.012), and NICU admissions (24% vs. 6%, p=0.028) were significantly increased. These outcomes mirror findings from international studies by Hochler et al. (2023), where AMA was associated with foetal overgrowth, birth asphyxia, and higher NICU admission rates. The strong association with hypoglycaemia likely reflects the higher prevalence of gestational diabetes in the AMA group (30).

This study reinforces that AMA is a significant independent risk factor for adverse maternal and neonatal outcomes in Iraq, consistent with global literature. Public health initiatives should aim to raise awareness about the risks of delayed childbearing while simultaneously improving access to comprehensive antenatal care (31).

## RECOMMENDATIONS

Women considering pregnancy at an advanced age should receive counselling on fertility options, associated risks, and potential complications, with priority given to structured antenatal follow-up and early screening for gestational diabetes, hypertension, and other disorders. Obstetric teams must anticipate higher caesarean section rates and related complications, ensuring adequate hospital resources such as blood products, ICU facilities, and trained personnel. Newborns of AMA mothers require close monitoring for hypoglycaemia and other complications, with appropriate neonatal care readily available. Public health strategies should highlight the benefits of earlier childbearing while respecting social and cultural contexts. Finally, larger multicentre studies in Iraq and the region are needed to confirm these findings and evaluate long-term outcomes for both mothers and children.

## REFERENCES


1. American College of Obstetricians and Gynecologists Committee on Gynecologic Practice and Practice Committee. Female age-related fertility decline. Committee Opinion No. 589. Fertil Steril. 2014;101(3):633-4.
2. Ye X, Baker PN, Tong C. The updated understanding of advanced maternal age. Fundam Res. 2024;4(6):1719–28.
3. Organisation for Economic Co-operation and Development. SF2.3 Age of Mothers at Childbirth and Age-Specific Fertility. 2021.
4. Correa-de-Araujo R, Yoon SSS. Clinical Outcomes in High-Risk Pregnancies Due to Advanced Maternal Age. J Womens Health (Larchmt). 2021;30(2):160-167.
5. Rowe T. Fertility and a woman's age. J Reprod Med. 2006;51(3):157-63.
6. Mikwar M, MacFarlane AJ, Marchetti F. Mechanisms of oocyte aneuploidy associated with advanced maternal age. Mutat Res Rev Mutat Res. 2020; 785:108320.
7. Lopian M, Kashani-Ligumsky L, Many A. A Balancing Act: Navigating Hypertensive Disorders of Pregnancy at Very Advanced Maternal Age, from Preconception to Postpartum. J Clin Med. 2023;12(14):4701.
8. Li Y, Ren X, He L, Li J, Zhang S, Chen W. Maternal age and the risk of gestational diabetes mellitus: A systematic review and meta-analysis of over 120 million participants. Diabetes Res Clin Pract. 2020;162(108044):108044.
9. Delbaere I, Verstraelen H, Goetgeluk S, Martens G, De Backer G, Temmerman M. Pregnancy outcome in primiparae of advanced maternal age. Eur J Obstet Gynecol Reprod Biol 2007; 135: 41–46.
10. Esposito G, Mauri PA, Cipriani S, Franchi M, Corrao G, Parazzini F. The role of maternal age on the risk of preterm birth among singletons and multiples: a retrospective cohort study in Lombardy, Norther Italy. BMC Pregnancy Childbirth. 2022;22(1):234.
11. Šťastná A, Fait T, Kocourková J, Waldaufová E. Does Advanced Maternal Age Comprise an Independent Risk Factor for Caesarean Section? A Population-Wide Study. Int J Environ Res Public Health. 2022;20(1):668.
12. Lao TT, Sahota DS, Cheng YK, Law LW, Leung TY. Advanced maternal age and postpartum hemorrhage - risk factor or red herring? J Matern Fetal Neonatal Med. 2014;27(3):243-6.
13. Hwang HG, Lee JH, Bang SM. Incidence of Pregnancy-Associated Venous Thromboembolism: Second Nationwide Study. Thromb Haemost. 2023;123(9):904-910.
14. Elmerdahl Frederiksen L, Ølgaard SM, Roos L, Petersen OB, Rode L, Hartwig T, Ekelund CK; Danish Central Cytogenetics Registry Study Group; Vogel I. Maternal age and the risk of fetal aneuploidy: A nationwide cohort study of more than 500 000 singleton pregnancies in Denmark from 2008 to 2017. Acta Obstet Gynecol Scand.

2024;103(2):351-359.

15. Hirata Y, Katsukura Y, Henmi Y, Ozawa R, Shimazaki S, Kurosawa A, Torii Y, Takahashi H, Iwata H, Kuwayama T, Shirasuna K. Advanced maternal age induces fetal growth restriction through decreased placental inflammatory cytokine expression and immune cell accumulation in mice. J Reprod Dev. 2021;67(4):257-264.
16. Chung YH, Hwang IS, Jung G, Ko HS. Advanced parental age is an independent risk factor for term low birth weight and macrosomia. Medicine (Baltimore). 2022;101(26):e29846.
17. Pethő B, Váncsa S, Váradi A, Agócs G, Mátrai Á, Zászkaliczky-Iker F, et al. Very young and advanced maternal age strongly elevates the occurrence of nonchromosomal congenital anomalies: a systematic review and meta-analysis of population-based studies. Am J Obstet Gynecol. 2024;231(5):490-500.e73.
18. Gamber RA, Blonsky H, McDowell M, Lakshminrusimha S. Declining birth rates, increasing maternal age and neonatal intensive care unit admissions. J Perinatol. 2024;44(2):203-208.
19. Yaman FK, Ezveci H, Dogru S, Harmanci MS, Bahçeci P, Gezginç K. The Impact of Advanced Maternal Age on Pregnancy Complications and Neonatal Outcomes. J Clin Med. 2025 Jul 31;14(15):5387.
20. 21. 31.Sarikhani Y, Najibi SM, Razavi Z. Key barriers to the provision and utilization of maternal health services in low-and lower-middle-income countries; a scoping review. BMC Womens Health. 2024 Jun 5;24(1):325.
21. Hunde GA, Zeben KF, Demeke T. Delayed healthcare seeking and associated factors for common childhood illnesses among caregivers with under-five children who visited Yem special woreda public health facilities, Southwest Ethiopia, 2023. PLoS One. 2024 Oct 17;19(10):e0297707.
22. Magnus MC, Wilcox AJ, Morken NH, Weinberg CR, Håberg SE. Role of maternal age and pregnancy history in risk of miscarriage: prospective register based study. BMJ. 2019 Mar 20;364:l869.
23. Khadra MM, Suradi HH, Amarin JZ, El-Bassel N, Kaushal N, Jaber RM, Al-Qutob R, Dasgupta A. Risk factors for miscarriage in Syrian refugee women living in non-camp settings in Jordan: results from the Women ASPIRE cross-sectional study. Confl Health. 2022 Jun 7;16(1):32.
24. Kuhnt J, Vollmer S. Antenatal care services and its implications for vital and health outcomes of children: evidence from 193 surveys in 69 low-income and middle-income countries. BMJ Open. 2017 Nov 15;7(11):e017122.
25. Tyas BD, Lestari P, Aldika Akbar MI. Maternal Perinatal Outcomes Related to Advanced Maternal Age in Preeclampsia Pregnant Women. J Family Reprod Health. 2019 Dec;13(4):191-200.
26. Ramonienė G, Malakauskienė L, Savukynė E, Maleckienė L, Gruzdaitė G. Pregnancy Complications and Outcomes in Obese Women with Gestational Diabetes. Medicina (Kaunas). 2025 Jan 1;61(1):51.
27. Yang Y, Wu N. Gestational Diabetes Mellitus and Preeclampsia: Correlation and Influencing Factors. Front Cardiovasc Med. 2022 Feb 16;9:831297.
28. Alshammari RF, Khan FH, Alkwai HM, Alenazi F, Alshammari KF, Sogeir EKA, Batool A, Khalid AA. Role of Parity and Age in Cesarean Section Rate among Women: A Retrospective Cohort Study in Hail, Saudi Arabia. Int J Environ Res Public Health. 2023 Jan 13;20(2):1486.
29. Ende HB, Lozada MJ, Chestnut DH, Osmundson SS, Walden RL, Shotwell MS, Bauchat JR. Risk Factors for Atonic Postpartum Hemorrhage: A Systematic Review and Meta-analysis. Obstet Gynecol. 2021 Feb 1;137(2):305-323.
30. Hochler H, Lipschuetz M, Suissa-Cohen Y, Weiss A, Sela HY, Yagel S, Rosenbloom JI, Grisaru-Granovsky S, Rottenstreich M. The Impact of Advanced Maternal Age on Pregnancy Outcomes: A Retrospective Multicenter Study. J Clin Med. 2023 Sep 1;12(17):5696.
31. Mbuagbaw L, Medley N, Darzi AJ, Richardson M, Habiba Garga K, Ongolo-Zogo P. Health system and community level interventions for improving antenatal care coverage and health outcomes. Cochrane Database Syst Rev. 2015 Dec 1;2015(12):CD010994.