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Pregnancy outcomes in women of advanced maternal age: A retrospective cohort study

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Abstract
Background: Delayed childbearing is believed to be associated with an increased rate of adverse pregnancy outcomes, when compared with early childbearing.
Objective: This study aimed to determine the incidence of advanced maternal age pregnancies and to evaluate their pregnancy outcomes at a tertiary care hospital.
Methods: A retrospective cohort study was conducted over a one-year period from 1st June 2022 to 31st May 2023. The study population were women ≥ 35 years, with singleton pregnancy, who were delivered ≥ 28 weeks of gestation. An equal number of women 20-34 years were used as control. Information was extracted from the hospital records. Data were analyzed with SPSS for Windows version 23. Statistical analysis was performed using the Chi-square test or Fisher's exact test as appropriate. The magnitude of an association was measured using Odds Ratio at 95% confidence interval where appropriate and the level of significance was set at P value of < 0.05.
Results: There were 1687 deliveries during the study period out of which 423 were advanced maternal age pregnancies, giving an incidence of 25.1%. There was a significant association between multiparity (Para ≥ 1) (OR 1.744; P=0.0001), history of previous caesarean delivery (OR 1.594; P=0.037) and decreased episiotomy rate (OR 2.444; P=0.020) with advanced maternal age pregnancy. Significant findings of preterm birth, mode of delivery, type of labour, cephalopelvic disproportion, preterm prelabour rupture of membranes, placenta previa, pregnancy-induced hypertension and low birth weight, were no longer significant following multivariate logistics regression analysis.
Conclusion: Advanced maternal age pregnancy was common in our setting, it was significantly associated with multiparity, history of previous caesarean delivery and less likelihood to receive episiotomy. There was no significant association with preterm delivery, low birth weight babies, birth asphyxia and stillbirth rates.

Keywords: Advanced maternal age, delayed childbearing, pregnancy outcomes.

Introduction
Advanced maternal age (AMA) is traditionally defined as childbearing in a woman ≥ 35 years of age, although trends in some published studies have increased this age to 40 years [1-3]. New definitions of very advanced maternal age (VAMA) and extremely advanced maternal age (EAMA) have been used to describe women delivering at 45-49 years and ≥ 50 years respectively [4]. Fertility in women decline from the mid-thirties, and women of AMA usually have a relatively lower tendency to achieve pregnancy within a short period. Fecundity, the probability of achieving pregnancy in a single menstrual cycle, is markedly decreased in these women [5].
A multi-country assessment in 29 countries revealed that the magnitude of pregnant women with AMA was 12.3% [6]. A study done in South Africa has reported the prevalence of AMA pregnancies as 17.5% [7]. There is a trend of rising average age at childbearing reported worldwide [8-10]. Delayed childbearing may be attributed to several reasons including late marriages, pursuit of academic and career opportunities, delayed conception due to subfertility, ineffective or lack of birth control, desire for large family size, and longer life expectancy [11, 12]. The most significant reason for an increasing trend in AMA pregnancies seems to be the progress made in assisted reproductive technologies (ART) which enables women in their forties and fifties to become pregnant [13, 14].

Delayed childbearing is believed to be associated with an increased rate of adverse pregnancy outcomes, when compared with younger women. Some controversy still exists in the literature on the pregnancy outcomes of AMA. The majority of studies report an association between AMA and preterm delivery, low birth weight, perinatal deaths, and caesarean delivery (CD) [6, 13, 15, 16]. Other studies have failed to demonstrate such unfavorable outcomes [17-19], and one study even found a lower risk of adverse fetal outcomes for older mothers [9].

The significance of parity has been emphasized in studies investigating the relationship between AMA and pregnancy outcomes [20, 21]. Some studies have reported that nulliparity was more likely to be related to adverse maternal outcomes in AMA [17, 21]. Contrary to developed countries where AMA pregnancy occur more often in nulliparous women, AMA women in developing countries are commonly multiparous as a result of factors such as more favorable cultural disposition and ineffective or lack of birth control methods [11, 22].

Although there are many studies that have investigated the association of advanced maternal age and pregnancy outcomes, none has been done in the study area. Therefore, the objective of this study was to evaluate the incidence, associated factors, and pregnancy outcomes of AMA deliveries in our tertiary health facility. Identifying the outcomes of AMA pregnancy will be useful in educating couples and empowering them to make informed choices about delayed childbearing.

Methods

Study Site / Area

This study was carried out at the Rivers State University Teaching Hospital (RSUTH) Port Harcourt, Nigeria. The hospital serves as a referral center for neighbouring health facilities and provides antenatal care and delivery services for women registered with the hospital. Port-Harcourt is a state capital, a metropolitan city, and made up of multi-ethnic, multicultural residents. The hospital has qualified teams of Obstetricians, Paediatricians and Anaesthetists, and availability of blood bank services. There is an average annual delivery of over 1500 births.

Study design and population

This was a retrospective cohort study conducted over a one-year period from 1st June 2022 to 31st May 2023. The study population were women aged ≥ 35 years, with singleton pregnancy, who were delivered ≥ 28 weeks of gestation at the RSUTH. An equal number of women, meeting the criteria, were used as control for comparison. The control group were aged 20-34 years, as this age group is associated with the best obstetric outcome [23] and were recruited from those who delivered immediately after a selected AMA mother. Those with multiple pregnancy, maternal age < 20 years, Rhesus is immunization, and incomplete data were excluded from both groups.

Data collection

A proforma was used to collect information from the hospital records. Data regarding maternal demographic factors like maternal age, parity, booking status, and gestational age (GA) at delivery were retrieved. Maternal outcomes in terms of medical, pregnancy or labour complications, mode of delivery, indication for caesarean delivery (CD), incidence of episiotomy/perineal tears and maternal mortality; as well as perinatal outcomes in terms of birth outcome (live or stillborn), sex of baby, birth weight, birth asphyxia (Apgar scores at 5 minutes < 7), admission to Neonatal Intensive Care Unit (NICU), congenital malformations, and stillbirths were noted.

Definition of terms

Patients who registered and received prenatal care elsewhere and were referred to our center were regarded as booked, while those who did not receive prenatal care anywhere were considered unbooked. Preterm births were taken as deliveries that occurred at < 37 completed weeks of gestation. Preterm prelabour rupture of membranes (PPROM) as rupture of foetal membranes > 2 hours before the onset of labour at GA < 37 weeks. Preterm labour was defined as progressive cervical effacement and dilatation caused by regular uterine contractions before 37 weeks GA. Low birth weight were babies that weighed < 2500 g. Macrosomia were babies that weighed ≥ 4000 g. Oligohydramnios was defined as amniotic fluid index ≤5 cm on ultrasound scan. Foetal distress was defined as persistent or repetitive abnormal foetal heart rate. Preeclampsia was established when the mother had systolic blood pressure (SBP) ≥ 140 mm Hg or diastolic blood pressure (DBP) ≥ 90 mm Hg, on two occasions 6 hours apart, and proteinuria +1 using a dipstick test, after 20 weeks of gestation. Pregnancy-induced hypertension was used to describe patients meeting the above criteria, with or without proteinuria. Severe preeclampsia was diagnosed when SBP ≥ 160 mm Hg or DBP ≥ 110 mm Hg, with a proteinuria ≥ 2+ using dipstick test. Eclampsia was diagnosed if a preeclamptic patient had a history of seizure. NICU admissions included all newborns admitted for any reason, including routine observation, according to the hospital guidelines. Suspected CPD was made when there was a clinically assessed contracted or borderline pelvis or big baby. Induced labour occurred if it was necessary to commence the process before its spontaneous occurrence regardless of the cause and GA. Stillbirths was defined as the death or loss of the foetus before or during birth after 28 weeks, both macerated and fresh.

Statistical analysis

Data were analyzed with SPSS (Statistical Package for Social Sciences) for Windows version 23 (SPSS Inc., Chicago, Illinois, USA). The data were analyzed using descriptive and inferential statistics and presented using frequency tables, as mean, numbers and percentages. Statistical analysis was performed using the students t-test, Chi-square test or Fisher's exact test as appropriate. The magnitude of an association was measured using Odds Ratio (OR) at 95% confidence interval where appropriate and the level of significance was set at p-value of < 0.05.

Results

There were a total of 1687 deliveries during the one-year study period out of which 423 were AMA pregnancies, giving an incidence of 25.1%. The mean maternal age among the AMA women ± SD was 37.44±2.08 years, with median of 37 years and a range of 35-47 years. The mean maternal age among the control women ± SD was 29.01±3.47 years, with median of 30 years and a range of 20-34 years. The median parity among the AMA women was Para 2, with a range of Para 0-8; while the

median parity among the control women was Para 1, with a range of Para 0-6. The mean gestational age among the AMA women and control group was 37.18±2.57 weeks and 37.74±2.29 weeks respectively, with a median of 38 weeks and range of 28-42 weeks in both groups. Table 1 relates to the distribution of the maternal and obstetric characteristics of both groups. The majority of the AMA mothers 79.7% were multiparous before birth, compared to 65.2% in the control group, and this was statistically significant (P=0.0001). There was also a significant finding on the distribution of the GA at delivery (P=0.001), with the proportion of the AMA mothers having preterm deliveries (19.4%) more than the control group (11.6%). Regarding the mode of delivery, majority of the women in both groups were delivered through CD, 63.8% and 55.3% for the AMA and control group respectively, and the difference between the groups in the distribution of mode of delivery was statistically significant (P=0.014). With regards to labour in the women, a significantly higher number 230 (54.4%) in the AMA group were delivered electively without laboring, compared to 163 (38.5%) of the control group. There was a significant difference (P=0.046) in the indications for CD between both groups, with a higher proportion of the AMA women requiring repeat CD for previous CD than the control group (35.6% versus 26.9% respectively). However, there was no significant difference between the groups with regards to the antenatal care (ANC) booking status (P=0.069).

Table 1: Maternal and obstetric characteristics among the study population.

Variables	AMA group N=423, N (%)	Control group N=423, N (%)	Total N=846
Parity			
Para 0	36 (20.3)	147 (34.8)	233 (27.5)
Para 1 - 4	319 (75.4)	270 (63.8)	589 (69.6)
Para ≥ 5	18 (4.3)	6 (1.4)	24 (2.8)
Chi Square = 20.046; p-value = 0.0001*			
Gestational age			
≤36 weeks	82 (19.4)	49 (11.6)	131 (15.5)
37-40 weeks	320 (75.7)	342 (80.9)	662 (78.3)
> 41 weeks	21 (5.0)	32 (7.6)	53 (6.3)
Chi Square = 12.885; p-value = 0.0001*			
ANC booking status			
Yes	398 (94.1)	384 (90.8)	782 (92.4)
No	25 (5.9)	39 (9.2)	64 (7.6)
Chi Square = 3.3135; p-value = 0.069			
Mode of delivery			
SVD	153 (36.2)	188 (44.4)	341 (40.3)
CD	270 (63.8)	234 (55.3)	504 (59.6)
Vacuum	0 (0.0)	1 (0.2)	1 (0.1)
Fisher's exact test = 7.093; p-value = 0.014*			
Type of labour			
No labour	230 (54.4)	163 (38.5)	393 (46.5)
Spontaneous	177 (41.8)	235 (55.6)	412 (48.7)
Induced	15 (3.5)	23 (5.4)	38 (4.5)
Augmented	1 (0.2)	2 (0.5)	3 (0.4)
Fisher's exact test = 21.700; p-value = 0.0001*			
Indication for CD (N=504)			
Previous CD	96 (35.6)	63 (26.9)	159 (31.5)
Severe preeclampsia	38 (14.1)	25 (10.7)	63 (12.5)
CPD	41 (15.2)	48 (20.5)	89 (17.7)
Foetal distress	15 (5.6)	25 (10.7)	40 (7.9)
Transverse lie	11 (4.1)	11 (4.7)	22 (4.4)
Breech presentation	10 (3.7)	10 (4.3)	20 (4.0)
Postdate pregnancy	11 (4.1)	9 (3.8)	20 (4.0)
Abruptio placenta	8 (3.0)	8 (3.4)	16 (3.2)
PPROM	9 (3.3)	4 (1.7)	13 (2.6)
Placenta previa	10 (3.7)	2 (0.9)	12 (2.4)
Obstructed labour	2 (0.7)	6 (2.6)	8 (1.6)
Others	19 (7.0)	23 (9.8)	42 (8.3)
Chi Square = 19.950; p-value = 0.046*			

*Statistically significant (p<0.05)

An analysis of the labour complications among the study groups is shown in Table 2. There was significantly more occurrence of CPD (8.5% versus 4.7%, P=0.027) and episiotomy (7.8% versus 2.4%, P=0.0001) in the control group than the AMA group respectively. There were no significant differences between the groups in terms of occurrence of perineal tear (P=0.388), foetal distress intrapartum (P=0.280), obstructed labour (P=0.287), and other complications (P=0.451). Other complications included cord prolapse 1 (0.2%) and retained placenta 1 (0.2%) among the AMA group and failed induction 2 (0.5%), cervical dystocia 2 (0.5%) and hand prolapse 1 (0.2%) among the control group.

Table 2: Labour complications among the study population.

Variables	AMA group N=423, n (%)	Control group N=423, n (%)	Total N=846, n (%)
CPD			
Yes	20 (4.7)	36 (8.5)	56 (6.6)
No	403 (95.3)	387 (91.5)	790 (93.4)
Chi Square = 4.895; p-value = 0.027*			
Episiotomy			
Yes	10 (2.4)	33 (7.8)	43 (5.1)
No	413 (97.6)	390 (92.2)	803 (94.9)
Chi Square = 12.961; p-value = 0.0001*			
Foetal distress			
Yes	13 (3.1)	19 (4.5)	32 (3.8)
No	410 (96.9)	404 (95.5)	814 (96.2)
Chi Square = 1.169; p-value = 0.280			
Perineal tear			
Yes	13 (3.1)	9 (2.1)	22 (2.6)
No	410 (96.9)	414 (97.9)	824 (97.4)
Chi Square = 0.747; p-value = 0.388			
Obstructed labour			
Yes	2 (0.5)	6 (1.4)	8 (0.9)
No	421 (99.5)	417 (98.6)	838(99.1)
Fisher's exact p-value = 0.287			
Other complications			
Yes	2 (0.5)	5 (1.2)	7 (0.8)
No	421 (99.5)	418 (98.8)	839 (99.2)
Fisher's exact p-value = 0.451			

*Statistically significant ($p<0.05$)

An analysis of the pregnancy complications among the study groups is shown in Table 3. There was significantly more occurrence of previous CD (26.0% versus 15.1%, P=0.0001), PPROM (2.8% versus 0.9%, P=0.043) and placenta previa (2.1% versus 0.5%%, P=0.034) in the AMA group compared to the control group respectively. There were no significant differences between the groups in terms of occurrence of postdate pregnancy (P=0.168), IUFD (P=0.171), transverse lie (P=0.486), breech presentation (P=0.634), abruptio placenta (P=0.614), preterm labour (P=1.000), short interpregnancy interval following CD (P=0.402), Fibroid coexisting with pregnancy (P=0.363), previous myomectomy (P=0.177) and other complications (P=0.451). Other pregnancy complications included bad obstetric history 2 (0.5%), foetal distress antepartum 2 (0.5%), Oligohydramnios 2 (0.5%) and abdominal pregnancy 1 (0.2%) among AMA group, and oligohydramnios 2 (0.5%), bad obstetric history 1 (0.2%), congenital abnormality 1 (0.2%), and prelabour rupture of membranes at term (PROM) 1 (0.2%) among the control group.

Table 3: Pregnancy complications among the study population.

Variables	AMA group N=423, n (%)	Control group N=423, n (%)	Total N=846, n (%)
Previous CD			
Yes	110 (26.0)	64 (15.1)	174 (20.6)
No	313 (74.0)	359(84.9)	672 (79.4)
Chi Square = 15.310; p-value = 0.0001*			
Postdate pregnancy			
Yes	18 (4.3)	27 (6.4)	45 (5.3)
No	405 (95.7)	396 (93.6)	801 (94.7)
Chi Square = 1.901; p-value = 0.168			
IUFD			
Yes	10 (2.4)	17 (4.0)	27 (3.2)
No	413 (97.6)	406 (96.0)	819 (96.8)
Chi Square = 1.875; p-value = 0.171			
Transverse lie			
Yes	8 (1.9)	11 (2.6)	19 (2.2)
No	415 (98.1)	412 (97.4)	827 (97.8)
Chi Square = 0.485; p-value = 0.486			
Breech presentation			
Yes	10 (2.4)	8 (1.9)	18 (2.1)
No	413 (97.6)	415 (98.1)	828 (97.9)
	Chi Square = 0.227 p-value = 0.634		
Abruptio placenta			
Yes	9 (2.1)	7 (1.7)	16 (1.9)
No	414 (97.9)	416 (98.3)	830 (98.1)
Chi Square = 0.255; p-value = 0.614			
PPROM			

Yes	12 (2.8)	4 (0.9)	16 (1.9)
No	411 (97.2)	419 (99.1)	830 (98.1)
	Chi Square = 4.077; p-value = 0.043*		
Preterm Labour			
Yes	7 (1.7)	7 (1.7)	14 (1.7)
No	416 (98.3)	416 (98.3)	832 (98.3)
Chi Square = 0.000; p-value = 1.000			
Short interval			
Yes	5 (1.2)	8 (1.9)	13 (1.5)
No	418 (98.8)	415 (98.1)	833 (98.5)
Chi Square = 0.703; p-value = 0.402			
Fibroid			
Yes	7 (1.7)	4 (0.9)	11 (1.3)
No	416 (98.3)	419 (99.1)	835 (98.7)
Chi Square = 0.829; p-value = 0.363			
Myomectomy			
Yes	7 (1.7)	2 (0.5)	9 (1.1)
No	416 (98.3)	421 (99.5)	837 (98.9)
	Fisher's exact p-value = 0.177		
Placenta previa			
Yes	9 (2.1)	2 (0.5)	11 (1.3)
No	414 (97.9)	421 (99.5)	835 (98.7)
Chi Square = 4.513; p-value = 0.034*			
Other complications			
Yes	7 (1.7)	5 (1.2)	12 (1.4)
No	416 (98.3)	418 (98.8)	834 (98.6)
	Fisher's exact p-value = 0.451		

*Statistically significant ($p<0.05$)

An analysis of the medical complications and other characteristics among the study groups is shown in Table 4. There was no significant difference in pregnancies conceived through assisted reproductive technology (IVF) (1 versus 2, P=1.000) between the AMA and control groups respectively. There was also no difference in maternal mortality with each group recording two deaths each. There was significantly more occurrence of PIH (12.2% versus 9.7%, P=0.044) in the AMA group than the control group respectively. There were no significant differences between the groups in terms of occurrence of GDM (P=0.614), HIV (P=0.057), and other medical complications (P=0.499). Other medical complications among the AMA group included antepartum anaemia 1(0.2%) and eclampsia 1(0.2%).

Table 4: Medical and other maternal characteristics among the study population.

Variables	AMA group N=423, N (%)	Control group N=423, N (%)	Total N=846, N (%)
PIH			
Yes	60 (14.2)	41 (9.7)	101 (11.9)
No	363 (85.8)	382 (90.3)	745 (88.1)
Chi Square = 4.059; p-value = 0.044*			
GDM			
Yes	9 (2.1)	7 (1.7)	16 (1.9)
No	414 (97.9)	416 (98.3)	830 (98.1)
Chi Square = 0.255; p-value = 0.614			
HIV			
Yes	16 (3.8)	7 (1.7)	23 (2.7)
No	407 (96.2)	416 (98.3)	823 (97.3)
Chi Square = 3.620; p-value = 0.057			
IVF			
Yes	1 (0.2)	2 (0.5)	3 (0.4)
No	422 (99.8)	421 (99.5)	843 (99.6)
Fisher's exact p-value = 1.000			
Maternal death			
Yes	2 (0.2)	2 (0.5)	4 (0.5)
No	421 (99.5)	421 (99.5)	842 (99.5)
Fisher's exact p-value = 1.000			
Other complications			
Yes	2 (0.5)	0 (0.0)	2 (0.)
No	421 (99.5)	423 (100.0)	84 4 (99.8)
Fisher's exact p-value = 0.499			

*Statistically significant ($p<0.05$)

The mean foetal birth weight among the AMA babies ± SD was 3048.70±541 g, with median of 3100 g and range of 800-4900 g; while the mean foetal birth weight among the control group babies ± SD was 3130.73±703 g, with median of 3200 g and

range of 600-5500 g. The distribution of the perinatal outcomes among the study groups is depicted in Table 5. There was no significant difference in the stillbirth rate between the AMA babies and their control counterparts (5.7% versus 5.2%, P=0.762) respectively. There was a significantly higher proportion of occurrence of low birth weight in the babies (15.8% versus 10.6%, P=0.033) of the AMA and control groups respectively. There was no significant difference in the occurrence of birth asphyxia (P=0.161) and NICU admissions (P=0.343) in the AMA group compared to their control counterparts. There were more female babies 217 (51.3%) in the AMA group but more male babies 232 (54.8%) in the control group, with no significant differences in the sex ratio between the groups (P=0.074).

Table 5: Perinatal outcome among the babies of women in the study population.

Variables	AMA group N=423, n (%)	Control group N=423, n (%)	Total N=846, n (%)
Foetal outcome			
Live	399 (94.3)	401 (94.8)	800 (94.6)
Stillbirth	24 (5.7)	22 (5.2)	46 (5.4)
Chi Square = 0.092; p-value = 0.762			
Birth weight			
< 2500 g	67 (15.8)	45 (10.6)	112 (213.2)
2500-3900 g	327 (77.3)	336 (79.4)	663 (78.4)
≥ 4000 g	29 (6.9)	42 (9.9)	71 (8.4)
Chi Square = 6.824; p-value = 0.033*			
Sex			
Male	20 6(48.7)	232 (54.8)	438 (51.8)
Female	217 (51.3)	191 (45.2)	408 (48.2)
Chi Square = 3.200; p-value = 0.074			
Birth Asphyxia			
Yes	21 (5.0)	13 (3.1)	34 (4.0)
No	402 (95.0)	410 (96.9)	812 (96.0)
	Chi Square = 1.961; p-value = 0.161		
NICU admission			
Yes	71 (16.8)	61 (14.4)	132 (15.6)
No	352 (83.2)	362 (85.6)	714 (84.4)
Chi Square = 0.898; p-value = 0.343			

*Statistically significant ($p< 0.05$)

The variables with an association on bivariate analysis were fitted into a multivariate logistic regression analysis, to see significant factors associated with AMA pregnancy, after excluding confounders, as shown in Table 6. There was a significant association between multiparity (Para ≥ 1) (OR 1.744; P=0.0001), history of previous CD (OR 1.594; P=0.037) and decreased episiotomy rate (OR 2.444; P=0.020) with AMA pregnancy. Advanced maternal age mothers were 1.744 times more likely to be nulliparous, 1.594 times more likely to have had a previous CD and 2.444 times less likely to receive episiotomy, than their younger counterparts. Preterm birth, mode of delivery, type of labour, CPD, PPROM, placenta previa, PIH and low birth weight were no longer significant factors following multivariate logistics regression analysis.

Table 6: Multiple logistic regression showing factors associated with AMA pregnancy among the study population.

Factors (N=152)	Coefficient(B)	Odds ratio (OR)	95% CI	P-Value
Parity				
Para ≥ 1	0.556	1.744	1.23-2.46	0.001*
Para 0 [R]		1		
GA at delivery				
≤36 weeks	0.626	1.871	0.90 3.89	0.093
≥ 37 weeks [R]		1		
Mode of delivery				
Vaginal delivery	0.342	1.408	0.77-2.58	0.268
CS/Vacuum [R]		1		
Type of labour				
No labour	0.445	1.560	0.83-2.94	0.168
Spontaneous/ Induced/Augmented [R]		1		
CPD				
Yes	0.021	1.021	0.46-2.25	0.959
No [R]		1		
Episiotomy				
Yes	0.894	2.444	1.15-5.20	0.020*
No [R]		1		
Previous CD				
Yes	0.466	1.594	1.03-2.47	0.037*
No [R]		1		
PPROM				
Yes	0.662	1.938	0.57-6.62	0.291

No [R]		1		
Placenta previa				
Yes	1.470	4.351	0.90-22.03	0.067
No [R]		1		
PIH				
Yes	0.208	1.231	0.74-2.05	0.425
No [R]		1		
Foetal Birth weight				
< 2500 g	-0.165	1.180	0.56-2.48	0.662
≥ 2500 g [R]		1		

Discussion

The incidence of AMA deliveries of 25.1% in this study was high. This was higher than the report of a multi-country assessment of 12.3% reported in 2014 [6], and the South African study of 17.5% reported in 2012 [7]. That delayed childbearing is associated with an increased rate of adverse pregnancy outcomes, when compared to younger women, has been controversial in the literature. Some studies have related these adverse outcomes among AMA pregnancies to nulliparity [17, 21]. Our study population were significantly mainly multiparous women, as commonly seen in most developing countries [11, 22], and did not support the association of AMA pregnancies with adverse pregnancy outcomes.

Contrary to the findings of some studies that AMA pregnancies were significantly associated with PIH [9, 24-27], this study did not find a significant association between AMA pregnancies with PIH. The association with PIH was attributed to increased oxidative stress and the fact that endothelial response to vasodilators diminishes as mothers get older [28, 29]. Nevertheless, other studies have also found no association between AMA pregnancies and PIH [18, 30, 31]. The disparity in the findings may be accounted for by differences in the study populations and methodologies.

Numerous studies have found an increased relative risk of CD in AMA pregnancies [9, 18, 24-27, 32]. The reasons deduced was that the proportion of malpresentation and bad obstetric history were higher in AMA mothers that pregnancy complications such as PIH and APH were commonly seen in AMA mothers, and that maternal request for CD was higher in AMA pregnancies. None of these factors were found to be significant in our women, and therefore it was not surprising that our study found no significant difference between both groups in terms of CD. This study however, found a significant association of prior CD with AMA women than their younger counterparts. The differences in reported findings could be due to peculiarities of the study area. Previously our Centre had reported a high overall CD rate (43.1%) and the commonest indication for CD was previous CD (averaging 30%) in a study by Awoyesuku *et al*. [33]. In the present study, the CD rates were 63.8% and 55.8% in the AMA and control groups respectively, with the difference not significant after multivariate logistics regression analysis. Previous CD was still the commonest indication in both groups at 35.6% and 26.9% respectively in the AMA and control groups.

One of the significant findings of this study was a decreased episiotomy rate among our AMA mothers. This finding is supported by the study of Radon-Pokracka *et al*. [32], who also found a higher rate of episiotomy among the younger counterparts. Considering the indications for episiotomy and the risk factors for perineal tears (such as nulliparity and foetal weight) seen more in our younger women, episiotomy can be said to be appropriately performed as prevention of unintended perineal laceration [32, 34].

The findings of this study showed that AMA has no significant association with preterm delivery, low birth weight babies, birth asphyxia and stillbirth rate. The reports of adverse perinatal outcomes in the literature have also been divided. Many studies support our findings of no adverse perinatal outcomes [11, 21, 35-37], some have reported decreased perinatal adverse outcomes or even found an inverse relationship [9, 13, 18, 19], yet others have reported significant adverse outcomes in terms of low birth weight [24, 27], preterm births [7, 24, 25, 27, 38], stillbirths [24, 27], and birth asphyxia [24, 30, 38]. These adverse outcomes have been attributed to iatrogenic prematurity and the finding of adverse pregnancy outcomes like PIH and APH being higher among AMA groups. The differences reported might be explained by maternal health seeking behaviour, patient selection criteria of the studies, and quality of obstetrical care services being provided.

Limitations

The retrospective design of the study was a limitation as it carries considerable risk of ascertainment bias, and some variables were not included in the analysis; and being a single center institution-based study means the results cannot be generalized to a wider population.

Conclusion

Advanced maternal age pregnancy was common in our setting, it was significantly associated with multiparity, history of previous caesarean delivery and less likelihood to receive episiotomy. There was no significant association with preterm delivery, low birth weight babies, birth asphyxia and stillbirth rates. As the trend in AMA pregnancy continues, and the adverse outcomes are still debatable, Obstetricians should provide rigorous surveillance, counselling, and optimized antenatal care services to women who embark on delayed childbearing. Further studies on this topic will be required to investigate the differences in the literature in terms of outcomes of AMA pregnancies.

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Conflict of interest

The Authors declare no conflict of interest.

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References

1. Verma S. Advanced maternal age and obstetric performance. Apollo Medicine. 2009;6(3):258-263.
2. Lean SC, Derricott H, Jones RL, Heazell AEP. Advanced maternal age and adverse pregnancy outcomes: A

systematic review and meta-analysis. PLOS One. 2017;12(10):e0186287. https://dx.doi.org/10.1371/journal.pone.0186287
3. Carolan MC, Davey MA, Biro M, Kealy M. Very advanced maternal age and morbidity in Victoria, Australia: a population-based study. BMC Pregnancy and Childbirth. 2013;13:80. https://dx.doi.org/10.1186/1471-2393-13-80
4. Osmundson SS, Gould JB, Butwick AJ, Massey YA, El-Sayed YY. Labor outcome at extremely advanced maternal age. American Journal of Obstetrics and Gynecology. 2016;214(3):362.e1-362.e7. https://dx.doi.org/10.1016/j.ajog.2015.09.103
5. Faddy MJ, Gosden RG, Gougeon A, Richardson SJ, Nelson JF. Accelerated disappearance of ovarian follicles in mid-life: implications for forecasting menopause. Human Reproduction. 1992;7:1342-6.
6. Laopaiboon M, Lumbiganon P, Intarut N, Mori R, Ganchimeg T, Vogel JP, *et al*. Advanced maternal age and pregnancy outcomes: a multi-country assessment. BJOG. 2014;121(1):49-56.
7. Hoque ME. Advanced maternal age and outcomes of pregnancy: a retrospective study from South Africa. Biomedical Research. 2012;23(2):281-5.
8. Sobotka T. Post-transitional fertility: Childbearing postponement and the shift to low and unstable fertility levels. Vienna: Vienna Institute of Demography Working Papers 01/2017; c2017.
9. Shan D, Qiu PY, Wu YX, Chen Q, Li AL, Ramadoss S, *et al*. Pregnancy outcomes in women of advanced maternal age: a retrospective cohort study from China. Scientific Reports. 2018;8:12239. https://dx.doi.org/10.1038/s41598-018-29889-3
10. Hamilton BE, Martin JA, Osterman MJK, Curtin SC, Matthews TJ. Births: final data for 2014. National Vital Statistics Reports. 2015;64:1-64.
11. Olusanya BO, Solanke OA. Perinatal correlates of delayed childbearing in a developing country. Archives of Gynecology and Obstetrics. 2012;285(4):951-957.
12. Usta IM, Nassar AH. Advanced maternal age, Part 1: Obstetric complications. American Journal of Perinatology. 2008;25(8):521-534.
13. Dietl A, Cupisti S, Beckmann MW, Schwab M, Zollner U. Pregnancy and obstetrical outcomes in women over 40 years of age. Geburtshilfe und Frauenheilkunde. 2015;75(08):827-832.
14. Ciancimino L, Lagana AS, Chiofalo B, Granese R, Grasso R, Triolo O. Would it be too late? A retrospective case-control analysis to evaluate maternal-fetal outcomes in advanced maternal age. Archives of Gynecology and Obstetrics. 2014;290(6):1109-1114.
15. Kenny LC, Lavender T, McNamee R, O'Neill SM, Mills T, Khashan AS. Advanced maternal age and adverse pregnancy outcome: evidence from a large contemporary cohort. PLOS One. 2013;8:e56583. https://dx.doi.org/10.1371/journal.pone.0056583
16. Huang L, Sauve R, Birkett N, Fergusson D, van Walraven C. Maternal age and risk of stillbirth: A systematic review. Canadian Medical Association Journal. 2008;178:165-172.
17. Wang Y, Tanbo T, Abyholm T, Henriksen T. The impact of advanced maternal age and parity on obstetric and perinatal outcomes in singleton gestations. Archives of Gynecology and Obstetrics. 2011;284:31-37.
18. Khalil A, Syngelaki A, Maiz N, Zinevich Y, Nicolaides KH. Maternal age and adverse pregnancy outcome: A cohort study. Ultrasound in Obstetrics & Gynecology. 2013;42:634-643.
19. Kanungo J, James A, McMillan D, Lodha A, Faucher D, Lee SK, *et al*. Advanced maternal age and the outcomes of preterm neonates: a social paradox? Obstetrics & Gynecology. 2011;118:872-877.
20. Lisonkova S, Janssen PA, Sheps SB, Lee SK, Dahlgren L. The effect of maternal age on adverse birth outcomes: does parity matter? Journal of Obstetrics and Gynaecology Canada. 2010;32:541-548.
21. Schimmel MS, Bromiker R, Hammerman C, Chertman L, Loscovich A, Grisaru GS, *et al*. The effects of maternal age and parity on maternal and neonatal outcome. Archives of Gynecology and Obstetrics. 2015;291:793-798.
22. Creanga AA, Gillespie D, Karklins S, Tsui AO. Low use of contraception among poor women in Africa: an equity issue. Bulletin of the World Health Organization. 2011;89(4):258-266.
23. Oboro VO, Dare FO. Pregnancy outcome in nulliparous women aged 35 or older. West African Journal of Medicine. 2006;25:65-68.
24. Mehari Ma, Maeruf H, Robles CC, Woldemariam S, Adhena T, Mulugeta M, *et al*. Advanced maternal age pregnancy and its adverse obstetrical and perinatal outcomes in Ayder comprehensive specialized hospital, Northern Ethiopia, 2017: A comparative cross-sectional study. BMC Pregnancy and Childbirth. 2020;20:60. https://dx.doi.org/10.1186/s12884-020-2740-6
25. Londero AP, Rossetti E, Pittini C, Cagnacci A, Driul L. Maternal age and the risk of adverse pregnancy outcomes: a retrospective cohort study. BMC Pregnancy and Childbirth. 2019;19:261. https://dx.doi.org/10.1186/s12884-019-2400-x
26. Kanmaz AG, Inan AH, Beyan E, Ogur S, Budak A. Effect of advanced maternal age on pregnancy outcomes: a single-centre data from a tertiary healthcare hospital. Journal of Obstetrics and Gynaecology; c2019. https://dx.doi.org/10.1080/01443615.2019.1606172
27. Montori MG, Martinez AA, Alvarez CL, Cuchi NA, Alcala PM, Martinez RS. Advanced maternal age and adverse pregnancy outcomes: A cohort study. Taiwanese Journal of Obstetrics & Gynecology. 2021;60:119-124.
28. Franklin SS, Larson MG, Khan SA, Wong ND, Leip EP, Kannel WB, *et al*. Does the relation of blood pressure to coronary heart disease risk change with ageing? The Framingham Study. Circulation. 2001;103:1245-1249.
29. Bruno RM, Masi S, Taddei M, Taddei S, Virdis A. Essential hypertension and functional microvascular ageing. High Blood Pressure & Circulation Prevention. 2018;25:35-40.
30. Nagarwal K, Chandrakanta GK, Manohar RK. Pregnancy outcome comparison in elderly and non-elderly primigravida attending at Mahila Chikitsalay Jaipur (Rajasthan) India. International Multispecialty Journal of Health. 2015;1(1):24-30.
31. Fuchs F, Monet B, Ducruet T, Chaillet N, Audibert F. Effect of maternal age on the risk of preterm birth: a large cohort study. 2018;13(1):e0191002. https://dx.doi.org/journal.pone.0191002
32. Radon-Pokracka M, Adrianowicz B, Plonka M, Danil P, Nowak M, Huras H. Evaluation of pregnancy outcomes at advanced maternal age. Open Access Macedonian Journal of Medical Sciences. 2019;7(12):1951-1956. https://dx.doi.org/10.3889/oamjms.2019.587
33. Awoyesuku PA, Pepple MDA, Altraide BO, John DH, Kwosah NJ. Pattern of obstetric clinic attendance,

deliveries, and neonatal outcome at a tertiary hospital during and after a free medical care programme. Journal of Advances in Medicine and Medical Research. 2020;32(2):22-31. https://dx.doi.org/10.9734/JAMMR/2020/v32i230363
34. Correa Jr MD, Passini Jr R. Selective episiotomy: indications, technique, and association with severe perineal lacerations. Revista Brasileira de Ginecologia e Obstetrícia. 2016;38(6):301-307. https://dx.doi.org/10.1055/s-0036-1584942
35. Rashed HEM, Awaluddin SM, Ahmad NA, Super NH, Lani Z, Aziz F, *et al*. Advanced maternal age and adverse pregnancy outcomes in Muar, Johor, Malaysia. Sains Malaysiana. 2016;45(10):1537-1542.
36. Amarin V. Effect of maternal age on pregnancy outcome: a hospital-based study. Journal of Medical and Medical Research. 2013;1(4):28-31.
37. Koo YJ, Ryu HM, Yang JH, Lim JH, Lee JE, Kim MY, *et al*. Pregnancy outcomes according to increasing maternal age. Taiwanese Journal of Obstetrics and Gynecology. 2012;51(1):60-65.
38. Almeida NK, Almeida RM, Pedreira CE. Adverse perinatal outcomes for advanced maternal age: a cross-sectional study of Brazilian births. Journal de Paediatric (Rio J). 2015;91(5):493-498.

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