

Original Article

Obstetric outcomes associated with advanced maternal age at the University Teaching Hospitals Women and Newborn Hospital in Lusaka, Zambia

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ABSTRACT

Introduction: Pregnant women aged 35 years and above have traditionally been termed as of advanced maternal age. These women are considered to have a higher incidence of obstetric complications than younger ones

Objectives: To investigate socio-demographic characteristics and obstetric outcomes in women of advanced age who delivered at the Women and Newborn Hospital, in Lusaka, Zambia.

Methods: This was a cross-sectional study in which a total of 226 postnatal women, both of advanced (35 years and above) and optimal age (20 – 34 years), that met the eligibility criteria were recruited. Systematic random sampling was used to recruit study participants and data was collected using a structured questionnaire, review of patient's hospital records, and the labour ward delivery registers. Statistical analysis was performed using a statistical package for social sciences (SPSS) version 26 software.

Results: The prevalence of advanced maternal age was 14.1%. The mean ages were 38 years (range 35 - 46 years) and 28 years in advanced and optimal maternal age groups respectively. Socio-demographic characteristics that were found to be

significantly associated with advanced maternal age included; education (P=0.036), occupation (P=0.015), the cultural belief of large families (P=0.003), and contraception use (P=0.001). There were more married women among advanced age women 105 (92.9%) than among optimal age women 99 (87.2%), however, there was no significant difference between the two groups (P=0.262). Divorce (P=0.689), income (P=0.701), and history of subfertility (P=0.291) were also not found to be different between the two groups. With regards to maternal outcomes, advanced maternal age was significantly associated with severe pre-eclampsia (AOR 2.131; 95% CI 1.190 – 3.816; P=0.011), postpartum haemorrhage (AOR 1.400; 95% CI 0.187 – 0.855; P=0.018), caesarean deliveries (AOR 1.395; 95% CI 1.115 – 4.719; P=0.028) and antepartum haemorrhage (AOR 2.425; 95% CI 1.029 – 5.714; P=0.043). On foetal outcomes, advanced maternal age was significantly associated with NICU admissions (AOR 3.075; 95% CI 1.298 – 7.287; P=0.011). However, there was no association with APGAR score at 5 minutes (P=0.174), birth weight (P=1.000), gestation age at birth (P=0.676), and PROM (P=0.557)

Conclusion: Generally, women of advanced maternal age were associated with more adverse obstetric outcomes than women of optimal childbearing age. Hence, there is a need to sensitise

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these women and their spouses on the risk of advanced maternal age on obstetric outcomes and the need for not postponing conception until the late 3rd decade of life.

INTRODUCTION

Pregnant women aged 35 years and above have traditionally been termed as of advanced maternal age.¹ These women are considered to have a higher incidence of obstetric complications than younger ones.² Currently, there is a growing trend of delaying pregnancy and as a result, the birth rate in advanced maternal age has increased and is still increasing all over the world.² Jean *et al.* found that these changing patterns of advanced age are having a significant public health impact because of increased risks of poor obstetric outcomes such as medical conditions, post-partum hemorrhages, fetal distress, stillbirths, admissions to NICU, preterm births and caesarean delivery.³ According to anecdotal data in the 4th quarter, 2017 at the University Teaching Hospitals (UTH) Women and Newborn Hospital in Lusaka, Zambia there was a rising number of women delivering after the age of 35 years. However, the prevalence, characteristics, and outcomes of such women have not been fully established.

The optimal childbearing age is between 20–34 years of age, however, many women today are delaying pregnancy until the late third or fourth decades of life.¹ The reasons motherhood is postponed are manifold and complex. They include late marriages, improved contraceptive techniques, the pursuit for higher education and career prospects and attaining financial independence.⁴

In the United Kingdom, it was found that there was a growing trend for childbearing to occur at a later time in women's lives.⁵ In South Africa, Hoque found that the prevalence of pregnancy in optimal and advanced age women was 82.5%, and 17.5%

respectively.⁶ Further analysis found that, compared to the optimal age group, advanced maternal age women had a significantly higher rate of preterm delivery, caesarean delivery, breech presentation, and low birth weight rate.⁶

Women should be supported in their decisions of whether to have children or not and when to plan childbearing. However, they also need to know how fertility and pregnancy outcomes change with age. Advanced maternal age is an emerging public health issue needing more research to help inform health care policies.¹ There is an urgent need for better public information on this issue. At the UTH Women and Newborn Hospital, the magnitude of advanced maternal age and its outcomes were not fully understood. Hence, there was a need to generate evidence that would potentially influence the management of antenatal mothers with advanced maternal age and women who postpone childbearing. This study endeavored to explore the socio-demographic characteristics and foeto-maternal outcomes associated with advanced maternal age among women that delivered at the UTH Women and Newborn Hospital.

METHODS

This was a cross-sectional study conducted at the UTH Women and Newborn Hospital, in Lusaka, Zambia. The study duration was four months, from July to October 2019. The sample size was 226 targeting postnatal mothers aged 20 years and above. Systematic random sampling was employed. Data was collected using a structured questionnaire which was tailored to the study objectives.

RESULTS

Statistical analysis was done using SPSS 26. Results were subjected to bivariate and multivariate logistic regression. A p-value of 0.05 was used to determine the significance of the findings.

Table 1: Bivariate analysis of maternal age by socio-demographic characteristics

Socio-demographic characteristics	Maternal age				statistics
	=35years		< 35years		
	N	%	N	%	
Marital status					0.262
Married	105	92.9	99	87.6	
Single	8	7.1	14	12.4	
Education					0.036
None	28	24.8	15	13.3	
Primary	27	23.9	19	16.8	
Secondary	31	27.4	43	38.1	
Tertiary	27	23.9	36	31.9	
Occupation					0.015
Housewife	66	58.4	49	43.4	
Business	19	16.8	22	19.5	
Formal employment	27	23.9	32	28.3	
None	1	0.9	10	8.8	
Age got married					0.004
< 20years	43	41.0	21	21.2	
20 – 30 years	61	58.1	78	78.8	
>35 years	1	1.0	0	0.0	
History of Useof contraception					0.001
Yes	98	86.7	62	54.9	
No	15	13.3	51	45.1	
Historyof subfertility					0.291
Yes	15	13.3	9	8.0	
No	98	86.7	103	92.0	
Belief onlarge number of children					0.003
< 2	1	1.0	2	1.9	
2-4	38	38.0	66	61.1	
=5	61	61.0	40	37.0	
Age at first birth (years)					0.001
< 20	40	37.7	20	17.9	
20 – 34	64	60.4	92	82.1	
= 35	2	1.9	0	0.0	

Table 2: Bivariate analysis of Advanced Maternal age by Obstetric outcomes

Obstetric outcomes	Maternal age				Statistics P
	≥35		<35		
	N	%	N	%	
Gestational hypertension					0.216
Yes	8	72.7	3	27.3	
No	105	48.8	110	51.2	
Severe Pre-eclampsia					0.003
Yes	55	63.2	32	36.8	
No	58	41.7	81	58.3	
Mode of Delivery					0.011
Caesarean	71	58.2	51	41.8	
Vaginal	42	40.4	62	59.6	
Anaemia					0.490
Yes	18	43.9	23	56.1	
No	95	51.4	90	48.6	
Postpartum haemorrhage (PPH)					0.019
Yes	35	64.8	19	35.2	
No	78	45.3	94	54.7	
Antepartum haemorrhage (APH)					0.047
Yes	20	69.0	9	31.0	
No	93	47.2	104	52.8	
Apgar score at 5 minutes					0.174*
Less than 7	2	22.2	7	77.8	
7 or more	111	51.2	106	48.8	
Baby admitted NICU					0.001
Yes	32	72.7	12	27.3	
No	81	44.5	101	55.5	
Birth weight					1.000
Abnormal	48	50.5	47	49.5	
Normal* *	65	49.6	66	50.4	

*Fisher's exact test

** Normal weight considered 2.5 -3.5 kg

Table 3: Multivariate Logistic regression of AMA by Severe Pre-eclampsia controlling for marital status, education, occupation, parity, BMI, and ANC utilisation

	OR	95%CI		P	AOR	95%CI		P
		Lower	Upper			Lower	Upper	
Age								
≥35	2.400	1.384	4.164	0.002	2.131	1.190	3.816	0.011
<35	1.000	-	-	-	1.000	-	-	-
Education								
No education	2.426	1.085	5.423	0.031	1.568	0.636	3.866	0.329
Primary	1.945	0.882	4.292	0.099	1.455	0.613	3.455	0.395
Secondary	1.182	0.574	2.433	0.651	1.012	0.460	2.227	0.976
Tertiary								
ANC utilisation								
Once	2.424	0.359	16.364	0.363	3.042	0.418	22.153	0.272
Twice	3.273	1.301	8.232	0.012	2.836	1.041	7.725	0.041
Thrice	2.597	1.172	5.757	0.019	2.263	0.978	5.238	0.057
Four times	3.004	1.218	7.407	0.017	2.684	1.036	6.957	0.042
More than four times	1.000	-	-	-	1.000	-	-	-

Table 4: Logistic regression of AMA by Mode of Delivery controlling for marital status, education, occupation, parity, BMI, and ANC utilisation

	OR	95%CI		P	AOR	95%CI		P
		Lower	Upper			Lower	Upper	
Age								
≥35	2.055	1.207	3.498	0.008	1.395	1.115	4.719	0.028
<35	1.000	-	-	-	1.000	-	-	-
Parity								
Once	0.378	0.147	0.969	0.043	0.471	0.156	1.423	0.182
Twice	0.455	0.170	1.213	0.116	0.545	0.177	1.683	0.292
Thrice	1.333	0.534	3.328	0.538	1.329	0.503	3.514	0.566
Four times	1.053	0.416	2.666	0.914	1.078	0.402	2.894	0.881
Five and above	1.000	-	-	-	1.000	-	-	-
BMI								
Obesity Class 1	0.228	0.046	1.127	0.070	0.238	0.042	1.355	0.106
Obesity Class 2	0.912	0.421	1.976	0.816	1.354	0.541	3.393	0.517
Obesity Class 3	1.000	-	-	-	1.000	-	-	-
ANC utilisation								
Once	1.121	1.086	2.120	0.061	1.001	0.892	1.997	0.056
Twice	2.638	1.096	6.351	0.031	2.578	1.008	6.593	0.048
Thrice	1.704	0.845	3.438	0.136	1.426	0.661	3.077	0.366
Four times	1.217	0.537	2.760	0.638	1.010	0.411	2.483	0.983
More than four times	1.000	-	-	-	1.000	-	-	-

Table 5: Logistic regression of AMA by PPH controlling for marital status, education, occupation, parity, BMI, and ANC utilisation

	OR	95%CI		p	AOR	95%CI		p
		Lower	Upper			Lower	Upper	
Age								
≥35	3.450	0.239	0.849	0.014	1.400	0.187	0.855	0.018
<35	1.000	-	-	-	1.000	-	-	-
Parity								
Once	0.740	0.226	2.426	0.619	0.384	0.103	1.432	0.154
Twice	1.650	0.401	6.784	0.488	1.047	0.242	4.534	0.951
Thrice	0.296	0.099	0.885	0.029	0.246	0.081	0.753	0.014
Four times	0.691	0.214	2.229	0.536	0.585	0.179	1.918	0.376
Five and above	1.000	-	-	-	1.000	-	-	-

Table 6: Logistic regression of AMA by APH, controlling for marital status, education, occupation, parity, BMI, and ANC utilisation

	OR	95%CI		p	AOR	95%CI		p
		Lower	Upper			Lower	Upper	
Age								
≥35	0.402	0.175	0.927	0.033	2.425	1.029	5.714	0.043
<35								
ANC utilisation								
Once	1.000	-	-	-	1.000	-	-	-
Twice	1.815	0.573	5.751	0.311	1.893	0.588	6.092	0.285
Thrice	3.025	1.089	8.403	0.034	3.247	1.152	9.156	0.026
Four times	2.035	0.646	6.413	0.225	2.171	0.678	6.951	0.192
More than four times	1.000	-	-	-	1.000	-	-	-

Table 7: Logistic regression of AMA by NICU admission controlling for marital status, education, occupation, parity, BMI, and ANC utilisation

	OR	95%CI		P	AOR	95%CI		P
		Lower	Upper			Lower	Upper	
Age								
≥35	3.325	1.610	6.865	0.001	3.075	1.298	7.287	0.011
<35	1.000	-	-	-	1.000	-	-	-
Parity								
Once	0.306	0.081	1.154	0.080	0.548	0.125	2.406	0.425
Twice	0.636	0.188	2.147	0.466	0.931	0.248	3.492	0.916
Thrice	0.876	0.304	2.526	0.807	0.993	0.337	2.928	0.990
Four times	1.450	0.512	4.108	0.485	1.635	0.558	4.789	0.370
Five and above	1.000	-	-	-	1.000	-	-	-
BMI								
Obesity Class 1	3.474	0.887	13.607	0.074	5.529	1.178	25.953	0.030
Obesity Class 2	0.869	0.311	2.428	0.788	1.372	0.450	4.181	0.578
Obesity Class 3	1.000	-	-	-	1.000	-	-	-

DISCUSSION

The prevalence of advanced maternal age was 14.1%. This was high compared to an average of 12.3% from most African and Asian countries.⁵ However, just like in most developed countries, Hoque, in his study at Dr. George Mukhari Hospital (DGMH) in South Africa, found a higher prevalence of 17.5%.⁶

Some socio-demographic factors that were attributed to this high prevalence included; the pursuit for higher education (P=0.036) and employment (P=0.015) and history of contraceptive use, to postpone pregnancy (P=0.001). Also the belief that a woman should have more children, was found more in the advanced age group (P=0.003). The reasons why parenthood was being postponed were manifold and complex to include late marriages, improved contraceptive techniques, pursuit for higher education, and career prospects.⁴ The belief in having more children was similar to the cultural beliefs of having large families in Zambia.⁷

The adverse obstetric outcomes were generally more in women of advanced age compared to the women of optimal age.⁷¹ (58.2%) women of advanced maternal age delivered by caesarean section and 42 (40.4%) vaginally (AOR 1.395, 95% CI, 1.115 – 4.719, p 0.028). This was similar to studies done regionally and globally which showed that advanced maternal age is associated with increased caesarean section rates.⁸ However, most studies in Africa gave caesarean section rates less than the findings of this study.^{3,9} The increase in Caesarean sections could be attributed to the fact that the UTH Women and Newborn Hospital is the highest referral hospital in Zambia and most cases referred to it are complicated.

Severe preeclampsia was found to be significantly associated with advanced maternal age with a 2.131 likelihood of developing the disease if someone is of advanced maternal age (AOR 2.131, 95% CI, 1.191 – 3.816, P=0.011). Among advanced maternal aged women, 55 (63.2%) of women developed severe pre-eclampsia while 32 (36.8%) developed the

disease in younger women. In Cameroon the prevalence of preeclampsia was 2.4% and 0.6% among advanced age women and younger women respectively.³ Even though the incidence in this study was higher, there was consistency in that both showed an increased risk of severe pre-eclampsia with advanced maternal age.

Advanced maternal age was found to be associated with increased risk of postpartum haemorrhage. 35 (64.8%) women of advanced age had developed postpartum haemorrhage compared to 19(35.2%) in the optimal group (AOR 1.4, 95% CI, 0.187–0.855, p 0.018). In Zimbabwe, Vivien had similar conclusion that advanced maternal age was a risk factor to developing postpartum haemorrhage.¹⁰

On the perinatal outcomes, admissions to neonatal intensive care unit (NICU) was significantly associated with advanced maternal age. The likelihood of NICU admissions in the advanced maternal age group was 3.075 times than in the optimal aged group (AOR 3.075, 95% CI, 1.298 – 7.283, P=0.011). This increased risk was similar to the findings from the studies in Europe.^{11,12} However, it was different from findings by Olusanya *et al* in Nigeria where there was no association between advanced maternal age and adverse perinatal outcomes.⁹

Prematurity, birth weight, APGAR score and PROM were not significantly associated with advanced maternal age. This was similar to findings from some African countries such as Nigeria.⁹ However, this was different from most studies from developed countries that found a strong association.^{13,14} Nevertheless, these studies were conducted outside Africa, hence may have some geographical influence.

CONCLUSION

The study found that the prevalence of advanced maternal age at Women and Newborn Hospital was high at 14.1% compared to most African nations. Some socio-demographic characteristics including

education, employment, and use of contraception were associated with advanced maternal age. Generally, women of advanced maternal age were associated with more adverse obstetric outcomes than women of optimal childbearing age.

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