Age at First Birth and Pregnancy Outcomes in Makurdi, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author AAO designed the study, wrote the protocol, as well as the first draft of the manuscript. Author POA retrieved the data from the Medical Records Department, the Obstetric Ward and Theatre registers and together with author AAO wrote the first draft of the manuscript. Author POE performed the statistical analysis and second draft of the manuscript. Author MTM managed the analyses and the literature searches. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims and Objectives: To determine the problems associated with primigravidae at extremes of reproductive life (less than 20 years and greater than 35 years) and compare them with those aged between 20 and 35 years.
Materials and Methods: A five year retrospective study compared 2331 primigravidae at extremes of reproductive age to an ideal age group at the Federal Medical Centre, Makurdi. Data was obtained from the Medical Records Department, Obstetric Ward and Theatre registers. Statistical analysis was performed using SPSS for windows version 16 and significance was set at a *P*-value of < .05.
Results: Nine thousand six hundred and forty one deliveries were conducted. Out of these deliveries, there were 2,331 primiparous births (24.2%). Of the primiparous births, 137 (5.8%) were

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teenage mothers, 104 (4.5%) elderly primigravidae and 2090 (89.7%) were ideal age primigravidae (and also the control). The average maternal age at first birth was 25.6±3.1 years. Teenagers had their first antenatal visit later than the elderly parturients at 23 weeks and 19 weeks respectively *(P < .05)*. The elderly primigravidae utilized antenatal services more than the teenagers and the ideal age primigravidae with booking status of 97.1% versus 62.8% and 75% respectively, while adequate antenatal attendance was 72.1% versus 21.2% and 47.0% respectively. Elderly primigravidae had a higher incidence of preterm labour, low birth weight neonates and co-existing uterine fibroids compared to the other two subgroups, which was statistically significant. The frequency of pregnancy induced hypertension and eclampsia was not statistically different for the three subgroups.

Conclusion: The number of women having their first birth at the extremes of age was small in our population. The elderly primigravidae had more unfavourable pregnancy outcomes, co-morbidities and tended to book earlier when compared with the teenagers and the ideal age group.

Keywords: Age; primigravidae; pregnancy outcomes; Makurdi; Nigeria.

1. INTRODUCTION

Age, as a factor, with other factors corrected for, can influence obstetric performance of women [1,2,3]. Women at extremes of reproductive life have increased feto-maternal risks; hence pregnancies in these women are considered high risk [3,4]. In Sokoto, Nigeria an incidence of 12.4% teenage births was reported by Ekele and Audu [5].

Teenage mothers have increased risks of developing complications, especially pre-eclampsia/eclampsia, malaria, anaemia and low-birth weight infants [3,5]. It is controversial whether biological or socio-economic inadequacies best explain these adverse pregnancy outcomes [6,7,8]. It is a common belief that teenage mothers more frequently experience cephalo-pelvic disproportion as a result of incomplete development of the bony pelvis. In this regard they tend to have prolonged labour, with increased risk of caesarean and instrumental deliveries [1,2]. Opinions are divided with respect to obstetric outcomes in these patients [3]. Some studies have concluded that adolescents do not have increased risk for caesarean delivery when compared to older controls [3,5].

In respect of obstetric performance, elderly primigravidae above 35 years, were more prone to numerous feto-maternal risks of chronic hypertension, fibroids, infertility, preterm delivery, caesarean section and a significantly increased rate of vaginal operative delivery complicating the pregnancy [2,9,10]. Laopaiboon et al. [11] reported an increased risk of maternal adverse outcomes, including maternal near miss, maternal death and severe maternal outcome

with increased maternal age. They also found that with advanced maternal age there was an increased risk of stillbirths, perinatal mortalities, low birth weight, Neonatal Intensive Care Unit (NICU) admission as well as low Apgar score at 5 minutes (< 7) [11]. In contrast, Shan et al. [9] found that advanced maternal age was a protective factor for preterm birth and NICU admission. They reported that lower educational level increased risks for many maternal complications including preeclampsia, Gestational Diabetes Mellitus (on insulin), placenta praevia and Post Partum Haemorrhage. Their study also revealed that the risks for adverse perinatal outcomes such as preterm birth, low birth weight and NICU admission were increased in mothers of low educational level. An antecedent history of infertility increases the risk for ART pregnancies in advanced maternal age women thus confirming that fertility declines in women older than 35. [11,12].

Ondes et al. [3] in comparing infants of adolescent and advanced age mothers that had spontaneous vaginal deliveries found that there was no statistically significant difference in abnormalities and still birth rates. They found that the rates for Small for Gestational Age infants were significantly higher for adolescent mothers while Large for Gestational Age infants were significantly higher for advanced age mothers. Births at these extremes of reproductive age have been well documented in developed countries. On the other hand, very few such studies have been reported in developing countries.

This study therefore set out to determine the problems encountered by teenage primigravidae less than 20 years and elderly primigravidae

aged 35 years and above when compared with a control group aged 20 to 34 years.

2. MATERIALS AND METHODS

A retrospective study of women having their first childbirth over a five year period between 1st September, 2002 and 31st August, 2007 was conducted at the Federal Medical Centre, Makurdi, Nigeria. It is a tertiary institution located in Makurdi the Benue State capital. Apart from providing maternal care it is also a referral facility for the North Central zone of Nigeria as well as the neighbouring states of Enugu, Kogi, Nasarawa and Taraba. The study was commenced after approval by the institution's ethics committee.

Using the available records, data related to age, educational level, marital status, occupation, gestational age at booking, number of clinic visits, antenatal events and complications, gestational age at onset of labour, fetal presentation, labour complications and mode of delivery were extracted. Fetal outcomes such as birth weight, Apgar score and admission into the NICU were also extracted.

The study groups were teenage primigravidae having their first birth at the age of 19 years or less and the elderly primigravidae aged 35 years and above. The control or ideal age group was the young primigravidae aged 20 – 34 years. Educated mothers were those with at least a senior secondary school certificate or the equivalent. Those with a lower qualification than this were classified as uneducated. Utilization of maternity services was categorized by the number of antenatal clinic visits into inadequate for less than 3 visits, adequate for between 3-9 visits and inappropriate for greater than 10 respectively.

Data obtained was analysed using SPSS version 16 statistical software. Descriptive statistics was used to summarise the data. Frequency tables were generated for categorical variables. Comparison was made between the three groups in terms of antenatal, labour and delivery outcomes using Chi squared or student t test as appropriate. A *P*-value < .05 was considered statistically significant.

3. RESULTS

During the period under review, there were 9,641 deliveries at the labour ward. Out of these, 2,331 (24.2%) were primigravidae.

Table 1 showed that women at the extremes of reproductive life (≤19 and ≥35) years were few in this centre at 5.8% and 4.5% respectively.

Table 2 showed some selected maternal characteristics. The average maternal age at first birth was 38.5, 18.3 and 28.2 years for elderly primigravidae, teenage primigravidae and the ideal age primigravidae respectively. The elderly primigravidae booked their pregnancies earlier than the teenagers and the ideal age group. There was a significant association between registering for antenatal care and age (*P* =.01).

Table 3 showed that there were more educated and employed mothers amongst the elderly primigravidae than the teenage or control group (78.9%, 4.4% and 48.9% respectively). There was a significant association with the age of first birth and education (*P* = .001). The control group was more likely to be married at the time of their first pregnancy than the elderly primigravidae and the teenage primigravidae (91.3%, 51.8% and 96.5% respectively).

Table 4 showed that teenagers registered for their first antenatal visit later than the elderly primigravidae at 23 weeks versus 19 weeks respectively (*P* = .05). The elderly primigravidae utilized antenatal service more frequently than the teenagers or control group with a booking status of 97.1% compared to 62.8% and 75.0% respectively and attended adequately at 72.1% compared to 21.2% and 47.0% respectively.

In terms of complications Table 5 showed that the frequency of malaria, preterm labour and fibroids was higher in the elderly primigravida than the Teenage and the Control subgroups. The difference for malaria was statistically significant (37.5% versus 18.3% and 24.0%; *P* = .001). Anaemia was however commoner among the teenage primigravidae than the elderly and the Control subgroups. The rate of occurrence of pregnancy induced hypertension (PIH) and pre-eclampsia were similar for the 3 groups (9.6%, 8.0% and 8.9% respectively). Multiple pregnancies (twins) were observed in all the groups (4.8%, 5.8% and 3.9% respectively).

The rate of spontaneous labour was highest amongst the teenagers (88.3%) compared with the ideal age primigravidae and elderly primigravidae (81.5% and 62.5% respectively), as depicted in Table 6. Preterm delivery was more frequent amongst the elderly primigravidae (44.2%). The incidence of breech /abnormal

presentation in labour, and elective caesarean section rate were significantly higher in the elderly primigravidae (32.7% and 5.8% respectively). However, the overall caesarean section rates for teenage and elderly primigravid groups were essentially the same (21.9% versus 20.2%).

The fetal outcome by age bracket, are depicted in Table 7. The incidence of low birth weight infants was higher amongst the elderly primigravidae (15.4%, *P* = .001). There were more stillbirths amongst the unbooked teenage primigravidae than the other two groups (1.5%, 0 .0% and 0.4% respectively). The elderly primigravidae had more depressed babies at birth (1 min Apgar scores 32.7%, 5.1% and 7.4% respectively) and more neonatal admissions to the NICU.

4. DISCUSSION

This study shows that the percentage of women having their first birth at the extremes of reproductive age is small. The average age at first birth was 25.6 ± 3.1 years. The prevalence of women who are less than 20 years (5.8%) in Makurdi is low when compared with 12.4% of teenage primigravidae reported by Ekele and Audu in Sokoto, Northern Nigeria [5]. It was also lower than 10.26% of all deliveries occurring in women under the age of 20 years reported in India by Rita et al. [13]. The prevalence of women aged 35 years or more in this study (4.5%) is slightly higher than 1.4% reported in Port Harcourt, Nigeria by Ojule et al. [14]. It is however lower than those reported from other centers [2,11].

The teenage primigravidae were socially and economically more disadvantaged as shown from the study results. They were less educated and unemployed. In this study too, the elderly primigravidae showed a higher incidence of malaria, preterm labour, and uterine fibroids compared to the other two groups, and this was statistically significant. Another finding was that 18.3% of elderly primigravidae had uterine fibroids complicating their pregnancies compared to only 2.5% among the control group aged 20-

34 years. This may be due to the fact that delayed childbearing in the elderly primigravid group from any reason is itself a risk factor for developing uterine fibroids. The frequency of pregnancy-induced hypertension and pre-eclampsia were not statistically different for the 3 groups. Other significant labour and delivery variables found in the study were the high incidence of breech presentation in labour, and preterm delivery amongst the elderly primigravidae. Other workers have documented similar findings [2,12].

The high incidence of induction of labour among the elderly primigravidae compared with the other two groups may probably be due to the anxiety associated with their pregnancies stemming from the Obstetricians on the one hand and the couples on the other. The overall caesarean section rates for the teenage and elderly primigravidae were both high (21.9% versus 20.2%), though the component of elective caesarean section was significantly higher amongst the elderly primigravidae. The latter were readily offered a caesarean section. This early resort to caesarean section may be due to the fact that pregnancy is considered to be high risk in this age group especially if there had been a preceding history of infertility [12,14]. Then again another reason may be that the chances of future childbirth may be dwindling.

The difference in stillbirth rates amongst the three groups became insignificant when adjustment was made for booking status. Growing older (age) has low correlation with education and does improve an adolescent's ability to participate in decision-making about her health. In fact the long-standing stance of the American Academy of Pediatrics has been that adolescents should be involved in medical decision-making [15]. With modern perinatal management, normal fetal outcomes are expected if patients present early to the labour ward. The perinatal mortality and stillbirths were very low amongst the elderly primigravidae in this study. This was contrary to the finding of high maternal and fetal risks in elderly primigravidae by some workers [16,17].

Table 1. Age distribution of patients

Age (Years)	No. of patient	Percentage (%)
≤ 19	137	5.8
20-34	2,090	89.7
≥ 35	104	4.5
Total	2,331	100%

Table 2. Selected maternal socio-biological characteristics

Socio-biological variable	Mean			Range			*P-*value
	*TP	EP	IP	TP	EP	IP	
Age (years)	18.3	38.5	28.2	16-19	35-40	20-34	.01
Height (m)	1.62	1.63	1.63	1.42-1.81	1.53-1.84	1.51-1.86	.63
Booking gestation (wks)	28.5	11.5	22.8	8-41	7-13	9-35	.01
Antenatal visit (Number)	3.3	13.6	8.1	1-10	5-15	3-14	.01
Birth weight (Kg)	2.80	3.15	2.88	1-3.5	2-4.5	1.5-5.4	.16

TP= Teenage primigravidae, EP= Elderly primigravidae, IP= Ideal age primigravidae

Table 3. Maternal social variables by age bracket

Social variable	Teenage primigravidae	Elderly primigravidae	Control n (%)	*P*-value
Educated	19 (13.9)	89 (85.6)	1573 (75.3)	.001
Employed	6 (4.4)	82 (78.9)	1021 (48.9)	.01
Unemployed	13 (9.5)	7 (6.7)	552 (26.4)	.05
Uneducated	118 (86.1)	15 (14.4)	517 (24.7)	.001
Employed	10 (7.3)	12 (11.5)	305 (14.6)	.13
Unemployed	108 (78.8)	3 (2.9)	212 (10.1)	.001
Marital status				
Married	71 (51.8)	95 (91.3)	2017 (96.5)	.001
Single	66 (48.2)	9 (8.7)	73 (3.5)	.14

Table 4. Pattern of Antenatal care utilization by the three groups of primigravidae

Antenatal Attendance	Teenage Primigravidae n (%)	Elderly Primigravidae n (%)	Control n (%)	*P*-value
Unbooked	51(37.2)	3 (2.9)	523 (25.0)	.001
Booked	86 (62.8)	101 (97.1)	1567 (75.0)	
Inadequate	53 (38.7)	23 (22.1)	441(21.1)	
Adequate	29 (21.2)	75 (72.1)	983 (47.0)	.01
Inappropriate	4 (2.9)	3 (2.9)	123 (5.9)	
Booking gestational Age (weeks)	23	19	22	.05

Table 5. Antenatal complications stratified by age bracket

*Complications	Teenage primigravida n(%)	Elderly Primigravidae n(%)	Control n(%)	*P*-value
Nil complications	34 (24.8)	19 (18.3)	639 (30.5)	
Anaemia	21 (15.3)	5 (4.8)	306 (14.6)	.05
Malaria	19 (18.3)	39 (37.5)	501 (24.0)	.001
Urinary tract infection (UTI)	5 (3.6)	2 (1.9)	115 (5.5)	.08
PIH/Pre – eclampsia	11 (8.0)	10 (9.6)	187 (8.9)	.15
Preterm Labour	0 (0.0)	17 (16.3)	79 (3.8)	
Fibroids	0(0.0)	19 (18.3)	53 (2.5)	
Threatened Abortion	1 (0.7)	6 (5.8)	57 (2.7)	.05
Antepartum haemorrhage	1(0.7)	3 (2.9)	73 (3.5)	.11
Postpartum haemorrhage	3 (2.2)	3 (2.9)	61 (2.9)	.35
Multiple Pregnancy	8 (5.8)	5 (4.8)	81(3.9)	.09

Some patients had more than one complication

Table 6. Gestational age, fetal presentation at onset of labour and mode of delivery by age

Labour variable	Teenage primigravidae n = 137 (%)	Elderly primigravidae n =104 (%)	Control n = 2090 (%)	*P*-value
Gestation < 37weeks	21 (15.3)	46 (44.2)	327 (15.6)	
37-40 weeks	87 (63.5)	54 (51.9)	1241 (59.4)	
>40 weeks	29 (21.2)	3 (2.9)	381 (18.2)	
Cephalic	101 (73.7)	70 (67.3)	1558 (73.6)	.18
Breech /Abnormal	36 (26.3)	34 (32.7)	131 (6.3)	.05
Spontaneous Labour	121 (88.3)	65 (62.5)	1703 (81.5)	.12
Induced labour	15 (10.9)	13 (12. 5)	349 (16.7)	.08
Labour durations (hrs)	7.8	7.7	7.4	.32
Spontaneous vaginal delivery	107 (78.1)	73 (70.2)	1249 (59.8)	.001
Elective caesarean section	1 (0.7)	6 (5.8)	36 (1.7)	.01
Emergency caesarean section	29 ((21.2)	15 (14.4)	522 (25.0)	.07
Instrumental delivery	3 (2.2)	2 (1.9)	66 (3.2)	.11
Breech delivery	0 (0.0)	3 (2.9)	37 (1.8)	

Table 7. Comparison of fetal outcome by age bracket

Fetal outcome	Teenage Primgravidae n(%)	Elderly Primgravidae n(%)	Control n(%)	*P*-value
Mean birthweight (Kg)	2.77	2.81	3.12	
Birth weight (SD)	0.29	0.51	0.45	
Birth weight				
Below 2.5 kg	4 (2.9)	16 (15.4)	71 (3.4)	.001
2.5 – 2.9 kg	39 (28.5)	19 (18.3)	333 (15.9)	.14
3.0 – 3.4 kg	79 (57.7)	57 (54.8)	1253 (60.0)	.11
3.5 – 3.9 kg	14 (10.2)	9 (8.7)	356 (17.0)	.31
>4kg	1 (0.7)	3 (2.9)	77 (3.7)	.08
Apgar score				
1minute (<7)	7.(5.1)	34 (32.7)	154 (7.4)	.001
5 minute (<7)	4 (2.9)	13 (12.5)	39 (1.9)	.01
NICU Admission	11 (8.0)	47 (45.2)	193 (9.2)	.01
Fetal Abnormality	0 (0.0)	0 (0.0)	2 (0.1)	
Stillbirth rate				
Booked	2 (1.5)	1 (1.0)	4 (0.2)	
Unbooked	2 (1.5)	1 (0.0)	9(0.4)	

The mean age at first childbirth in this study of 26 years was high and together with other maternal characteristics such as height, was similar to findings in the developed world. It is comparable to the average age of 27.05 years reported by Gharoro and Igbafe in Benin City, Nigeria [17]. The implication of this for reproductive performance is positive but it may slow down the dynamics of population growth.

The limitation of this study was that since it was hospital based, the findings may not be representative of the general population. In addition, since the study was retrospective, some data may have been missed during the course of retrieval. The study focuses on women having live births in our facility and does not account for home deliveries which constitute an important bias. Since the study had no information on antenatal care visits and labour supervision of the study population, no conclusion could be drawn on the importance of these two key elements. Again, due to advances and changes in health care provision as well as population dynamics further studies would have to be done to determine the current situation in the Centre.

5. CONCLUSION

The effect of age on women at first pregnancy and delivery at extremes of reproductive life is an important health issue. These patients constitute a high risk group. The number of women having their birth at the extremes of reproductive age was small in our population when compared to other parts of Nigeria like Sokoto [5] and Benin City [17]. This study also found that, elderly primigravidae had a higher incidence of preterm labour, low birth weight neonates and co-existing uterine fibroids when compared to the other two groups. The pregnancies were however well tolerated by elderly primigravidae who tended to book early and attended antenatal clinics adequately They would need to be encouraged to continue with this practice while their labour and delivery also should always be conducted by skilled birth attendants to ensure good obstetric outcomes. The findings of this study should aid the clinician in antenatal counseling and managing women at extremes of reproductive life.

CONSENT

It is not applicable.

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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