1 # Age at First Birth and Pregnancy Outcomes in Makurdi, Nigeria

2 **ABSTRACT**

3 **Aims and objectives**

4 To determine the problems associated with primigravidae at extremes of reproductive life (less than 20

5 years and greater than 35 years) and compare them with those aged between 20 and 35 years.

6 **Materials and method**

7 A five year retrospective study compared 2331 primigravidae at extremes of reproductive age to an ideal

8 age group at the Federal Medical Centre, Makurdi. Data was obtained from the Medical Records

9 Department, Obstetric Ward and Theatre registers. Statistical analysis was performed using SPSS for

10 windows version 16 and significance was set at a *P*-value of < .05.

11 **Results**

12 Nine thousand six hundred and forty one deliveries were conducted. Out of these deliveries, there were

13 2,331 primiparous births (24.2%). Of the primiparous births, 137 (5.8%) were teenage mothers, 104

14 (4.5%) elderly primigravidae and 2090 (89.7%) were ideal age primigravidae (and also the control). The

15 average maternal age at first birth was $25.6 \pm 3.1$ years. Teenagers had their first antenatal visit later than

16 the elderly parturients at 23 weeks and 19 weeks respectively *(P < .05)*. The elderly primigravidae

17 utilized antenatal services more than the teenagers and the ideal age primigravidae with booking status of

18 97.1% versus 62.8% and 75% respectively, while adequate antenatal attendance was 72.1% versus 21.2%

19 and 47.0% respectively. Elderly primigravidae had a higher incidence of preterm labour, low birth weight

20 neonates and co-existing uterine fibroids compared to the other two subgroups, which was statistically

21 significant. The frequency of pregnancy induced hypertension and eclampsia was not statistically

22 different for the three subgroups.

23 **Conclusion**

24  The number of women having their first birth at the extremes of age was small in our population. The

25  elderly primigravidae had more unfavourable pregnancy outcomes, co-morbidities and tended to

26  book earlier when compared with the teenagers and the ideal age group.

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## 1. INTRODUCTION

30  Age, as a factor, with other factors corrected for, can influence obstetric performance of women. [1], [2], [3]

31  Women at extremes of reproductive life have increased feto-maternal risks; hence pregnancies in these

32  women are considered high risk. [3], [4] In Sokoto, Nigeria an incidence of 12.4% teenage births was

33  reported by Ekele and Audu. [5]

34  Teenage mothers have increased risk of developing complications, especially pre-eclampsia/eclampsia,

35  malaria, anaemia and low-birth weight infants. [3], [5] It is controversial whether biological or socio-

36  economic inadequacies best explain these adverse pregnancy outcomes. [6], [7], [8] It is a common belief that

37  teenage mothers more frequently experience cephalo-pelvic disproportion as a result of incomplete

38  development of the bony pelvis. In this regard they tend to have prolonged labour, with increased risk of

39  caesarean and instrumental deliveries. [1], [2] Opinions are divided with respect to obstetric outcomes in

40  these patients. [3] Some studies have concluded that adolescents do not have increased risk for caesarean

41  delivery when compared to older controls. [3], [5]

42  In respect of obstetric performance, elderly primigravidae above 35 years, were more prone to numerous

43  feto-maternal risks of chronic hypertension, fibroids, infertility, preterm delivery, caesarean section and a

44  significantly increased rate of vaginal operative delivery complicating the pregnancy. [2], [9], [10]

45  Laopaiboon et al [11] reported an increased risk of maternal adverse outcomes, including maternal near

46  miss, maternal death and severe maternal outcome with increased maternal age. They also found that with

47  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. MATERIAL 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.

72  Using the available records, data related to age, educational level, marital status, occupation,

73  gestational age at booking, number of clinic visits, antenatal events and complications,

74  gestational age at onset of labour, fetal presentation, labour complications and mode of delivery

75  were extracted. Fetal outcomes such as birth weight, Apgar score and admission into the NICU

76  were also extracted.

77  The study groups were teenage primigravidae having their first birth at the age of 19 years or less

78  and the elderly primigravidae aged 35 years and above. The control or ideal age group was the

79  young primigravidae aged 20 – 34 years. Educated mothers were those with at least a senior

80  secondary school certificate or the equivalent.  Those with a lower qualification than this were

81  classified as uneducated. Utilization of maternity services was categorized by the number of

82  antenatal clinic visits into inadequate for less than 3 visits, adequate for between 3-9 visits and

83  inappropriate for greater than 10 respectively.

84  Data obtained was analysed using SPSS version 16 statistical software. Descriptive statistics was

85  used to summarise the data. Frequency tables were generated for categorical variables.

86  Comparison was made between the three groups in terms of antenatal, labour and delivery

87  outcomes using Chi squared or student t test as appropriate. A $P$-value $< .05$ was considered

88  statistically significant.

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90  **3. RESULTS**

91  During the period under review, there were 9,641 deliveries at the labour ward. Out of these,

92  2,331 (24.2%) were primigravidae.

93    Table 1 showed that women at the extremes of reproductive life ($\leq$19 and $\geq$35) years were few in

94    this centre at 5.8% and 4.5% respectively.

95                              **Table 1: Age distribution of patients**

| Age (Years) | No. Of patient | Percentage (%) |
|---|---|---|
| $\leq$ 19 | 137 | 5.8 |
| 20-34 | 2,090 | 89.7 |
| $\geq$ 35 | 104 | 4.5 |
| **Total** | **2,331** | **100%** |

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97    Table 2 showed some selected maternal characteristics. The average maternal age at first birth

98    was 38.5, 18.3 and 28.2 years for elderly primigravidae, teenage primigravidae and the ideal age

99    primigravidae respectively. The elderly primigravidae booked their pregnancies earlier than the

100   teenagers and the ideal age group. There was a significant association between registering for

101   antenatal care and age ($P$ =.01).

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**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 |

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

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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 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 |

118    Table 4 showed that teenagers registered for their first antenatal visit later than the elderly

119    primigravidae at 23 weeks versus 19 weeks respectively ($P$ = .05). The elderly primigravidae

120    utilized antenatal service more frequently than the teenagers or control group with a booking

121    status of 97.1% compared to 62.8% and 75.0% respectively and attended adequately at 72.1%

122    compared to 21.2% and 47.0% respectively.

123    **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 |

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126 In terms of complications Table 5 showed that the frequency of malaria, preterm labour and

127 fibroids was higher in the elderly primigravida than the Teenage and the Control subgroups. The

128 difference for malaria was statistically significant (37.5% versus 18.3% and 24.0%; $P$ = .001).

129 Anaemia was however commoner among the teenage primigravidae than the elderly and the

130 Control subgroups. The rate of occurrence of pregnancy induced hypertension (PIH) and pre-

131 eclampsia were similar for the 3 groups (9.6%, 8.0% and 8.9% respectively). Multiple

132 pregnancies (twins) were observed in all the groups (4.8%, 5.8% and 3.9% respectively).

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**Table 5: Antenatal complications stratified by age bracket**

| *Complications | Teenage primigravidae 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 |

148 *Some patients had more than one complication*

149 The rate of spontaneous labour was highest amongst the teenagers (88.3%) compared with the

150 ideal age primigravidae and elderly primigravidae (81.5% and 62.5% respectively), as depicted

151 in Table 6. Preterm delivery was more frequent amongst the elderly primigravidae (44.2%). The

152 incidence of breech /abnormal presentation in labour, and elective caesarean section rate were

153 significantly higher in the elderly primigravidae (32.7% and 5.8% respectively). However, the

154 overall caesarean section rates for teenage and elderly primigravid groups were essentially the

155 same (21.9% versus 20.2%).

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**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) | |

169  The fetal outcome by age bracket, are depicted in Table 7. The incidence of low birth weight

170  infants was higher amongst the elderly primigravidae (15.4%, $P$ = .001). There were more

171  stillbirths amongst the unbooked teenage primigravidae than the other two groups (1.5%, 0 .0%

172  and 0.4% respectively). The elderly primigravidae had more depressed babies at birth (1 min

173  Apgar scores 32.7%, 5. 1 % and 7.4% respectively) and more neonatal admissions to the NICU.

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**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) | |

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## 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 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]

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 constitutes an

224 important bias. Since the study had no information on antenatal care visits and labour
225 supervision of the study population, no conclusion could be drawn on the importance of these
226 two key elements. Again, due to advances and changes in health care provision as well as
227 population dynamics further studies would have to be done to determine the current situation in
228 the Centre.

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## 5. CONCLUSION

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

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**COMPETING INTERESTS:** No conflict of interest

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**ETHICAL APPROVAL:** The study was approved by the Institutional Ethics Committee

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