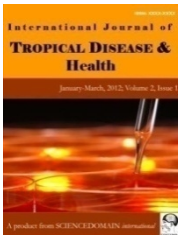

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Determinants of Delivery Outcomes in Teenage Mothers at a University Teaching Hospital, South-Eastern, Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors. JAO, EON and BNE designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. HAAU managed the analyses of the study. JAO managed the literature searches. All authors read and approved the final manuscript.

Research Article

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ABSTRACT

Aim: This study aims at identifying some delivery outcome determinants in teenage mothers and evaluating the effect of booking in light of these parameters.
Study Design: A retrospective study.
Place and Duration of Study: Teenage mothers who delivered in a teaching hospital in Nigeria over a 5-year period (between 1st Jan, 2003 and 31st Dec, 2007).
Method: Labour ward register and midwives report books were used to get their hospital numbers. These case notes were retrieved subsequently from the health records department and relevant data extracted.
Results: There were 8,297 deliveries during the study period and 453 cases of teenage mothers giving a teenage delivery incidence of 5.5%. Of the total teenage deliveries, older teenage mothers (16-19 years) constituted 94.7% while younger teenage mothers were 5.3%. Booked teenage mothers were 83.5% while 16.5% were unbooked. Still birth rate

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was 87 per 1000. No maternal death was recorded among the teenage mothers. Older teenagers had better obstetric indices such as higher vaginal delivery rate, lower caesarean section and instrumental delivery rate, reduced blood loss, better Apgar scores and less intra uterine fatal deaths than younger teenagers. However, some of these were not statistically significant and in some cases, were barely marginal.
Conclusion: Influence of age on teenage delivery and other biological risk factors may not be as much as earlier perceived. Paying special attention to the socio-economic condition of teenage mothers and by extension, their access to essential obstetric care, may obviate the poor obstetric outlook hitherto attached to it.

Keywords: Teenage; age; booking; delivery; outcome; Apgar score.

1. INTRODUCTION

Teenage pregnancy is pregnancy in females aged between 13 and 19 years. (McGraw-Hill, 2003) It is considered a high risk obstetric event with a global outlook (Mahararkar et al., 2008; Trivedi and Pasrija, 2007).

Teenage mothers are young girls who are still growing. They are therefore ill equipped physiologically, socio-economically, culturally and even psychologically to cope with the condition (Trivedi and Pasrija, 2007; Jimoh and Abdul, 2004).

Teenagers constitute about 1.5 billion persons out of a total human population of 6.8 billion in the world and 86% of this subgroup lives in developing countries. (UNFPA, 2009) Teenage pregnancy is about 13 million pregnancies (10% world total) births *per annum*. More than 90% of these are in the developing countries. (Mayor, 2004) In West Africa, 55% of women are said to give birth before the age of 20 years. This translates to about 143 births per thousand teenagers as opposed to the world figure of 65/1000 teenagers (Mayor, 2004; Akande, 2009).

The National demographic and health survey for the year 2006 estimated the teenage pregnancy rate in Nigeria at 22% (Federal Ministry of Health, Nigeria, 2002). From Ilorin, Benin and Sokoto, incidence of teenage deliveries were 9.93%, 1.7% and 11.8% of all deliveries in their tertiary health institutions respectively (Nwobodo and Adoke, 2005; Ebeigbe and Gharoro, 2007; Mutihir and Maduka, 2006) reflecting the variation in incidence in different parts of Nigeria.

Before now teenagers constituted majority of pregnant mothers in our environment. With education and career pursuit, early marriage and pregnancy is delayed. Also, before this period majority of deliveries were done with traditional midwives. Education and provision of healthcare facilities with its attendant advantages have led to increasing number of parturient delivering in hospitals.

Several causes and predisposing factors to teenage pregnancy have been deduced from recent studies. One major factor is early coitarche which is a result of early sexual maturation with decreasing age at menarche. Others are increased emphasis on sexual activity, increased cultural permissiveness to sex, peer pressure and lack of parental guidance (Nwobodo and Adoke, 2005). Early age at marriage also constitutes a major risk

factor especially in some cultures such as Hausa/Fulani tribes in northern Nigerian (Allan Guttmatcher Institute, 2004; Miguel, 2003). Other factors are low socio-economic status, low educational and low career aspiration, residence in a single parent home, poor family relationship as well as non availability/non utilization of contraceptive services (McGraw-Hill, 2003; Nwobodo and Adoke, 2005; Allan Guttmatcher Institute, 2004; Miguel, 2003).

Teenage mothers are children at a stage of rapid growth who are in high nutritional needs. Many of them have not yet completed secondary school education, have no skills, still apprentices and are not financially independent (McGraw- Hill,2003; Guttmatcher Institute, 2004; Miguel, 2003; Loto et al., 2004).

With the extra nutritional needs posed by pregnancy as well as the socio-economic disadvantages faced by many, especially in developing countries, complications abound both in antenatal and intrapartum periods (McGraw-Hill, 2003; Jimoh and Abdul, 2004; UNFPA, 2009; Mayor, 2004; Akande, 2009; Nwobodo and Adoke, 2005; Ebeigbe and Gharoro, 2007; Mutihir and Maduka, 2006; Allan Guttmatcher Institute, 2004). These include: Unsafe abortion; pregnancy induced hypertension, anaemia in pregnancy, Malaria in pregnancy, preterm labour, low birth weight babies, fetopelvic disproportion, increased obstetric intervention, all culminating in increased maternal, perinatal as well as neonatal morbidity and mortality (Mahararkar et al., 2008; Trivedi and Pasrija, 2007; Jimoh and Abdul, 2004; Nwobodo and Adoke, 2005; Ebeigbe and Gharoro, 2007; Mutihir and Maduka, 2006; Allan Guttmatcher Institute, 2004; Miguel, 2003).

While all studies seem to agree that socio-economic and cultural factors adversely affect teenage pregnancy, some studies seem to exonerate biological age as causes of the complication (Mahararkar et al., 2008; Trivedi and Pasrija, 2007; Ebeigbe and Gharoro, 2007; Mutihir and Maduka, 2006; Allan Guttmatcher Institute, 2004; Miguel, 2003; Loto et al., 2004; Akinala et al., 2001).

Other studies as yet, differentiate younger teenager mothers (<16 years) from older teenage mothers in age related obstetric outcome, claiming that older teenagers have less obstetric risks and indeed their obstetric outcome approximate that of mothers in the second decade of life, while younger mothers have greater obstetric risk that is age related (Akande, 2009; Nwobodo and Adoke, 2005; Ebeigbe and Gharoro, 2007). This study is set to determine the factors that determine the feto-maternal outcome.

2. MATERIALS AND METHODS

Ebonyi State University Teaching Hospital (EBSUTH) is one of the two tertiary health institutions situated in Abakaliki, the Ebonyi State Capital in Nigeria. This health facility receives referrals from all parts of the state as well as the neighbouring states of Enugu, Cross-River, Benue and Abia States.

The staff complements of Obstetrics and Gynaecology department of EBSUTH consists of 10 consultant Obstetrician/Gynecologists, 24 resident doctors and numerous house officers and midwives. During the period of study, the labour ward undertook an average of 1600 deliveries annually. The lying in ward had 50 beds.

Pregnant women are admitted into the labour ward either directly from antenatal clinic, antenatal ward, Accident and Emergency Department or from home. For booked clients, decision on the mode of delivery is taken in the antenatal clinic by the managing consultant.

For unbooked patients, this decision is taken in consultation with the consultant on call or the senior registrar on call.

In all cases, history is taken by the admitting resident doctor. Antenatal records for booked clients are reviewed and a full physical examination is performed.

Labour monitoring is commenced with regular observation of maternal pulse, blood pressure, uterine contraction and fetal heart rate. Progress of labour is appraised through periodic assessment of cervical dilatation and descent of the presenting part. All events of labour are documented on the partograph. In this way normal progress or any abnormality is easily observed.

Based on antenatal factors and events of labour, a decision on mode of delivery is made: spontaneous or assisted vaginal delivery. Decision on abdominal delivery may be made in antenatal clinic, antenatal or labour ward. Whichever mode of delivery is adopted, the baby delivered is handed over to neonatologists for resuscitation and Apgar scoring. Active management of the third stage of labour is used and maternal blood loss is estimated by the attending resident doctor and midwife.

2.1 Study Population

All parturient whose ages were less than 20 years and whose pregnancies were 28 weeks and above were included in the study. Other parturient whose ages were 20 years and above and/or whose pregnancies were less than 28 weeks were excluded.

2.2 Study Design

This is a retrospective study of all the parturient who met the inclusion criteria above and who delivered their babies in EBSUTH. After obtaining clearance from Ethics and Research committee of EBSUTH, labour ward register and midwives' report books were used to identify the hospital numbers of these parturient. Their case notes were subsequently retrieved from Health Record Department and relevant data extracted. The study was between first January 2003 and thirty first December 2007.

Information collated related to the age of the parturient, educational status, marital status, occupation, parity and booking status. Other information obtained were mode of delivery, estimated blood loss, neonatal birth weight and Apgar score.

2.3 Data Analysis

These data were analyzed using SPSS version 16. The mean and percentages were used to describe the quantitative data. The chi- square was used to test for statistical significance. AP value of less than 0.05 was taken as statistical significance. Results were displayed in tables. Biosocial profile in the teenage mothers is shown in Table 1. Differences in mode of delivery between younger teenage mothers and older teenage mothers are shown in Table 2.

Table 1. Biosocial profile in the teenage mothers

Biosocial factor	Study group			X^2	p-value
	<16 years n (%)	16-19 yrs n (%)	Total n (%)		
Marital status:				5.10	0.02393
Married	4(19.0)	204(50.3)	208(48.8)		
Not married	17(81.0)	201(49.7)	218(51.2)		
Total	21(100)	405 (100)	426(100)		
Occupation:				0.13	0.71441
Employed	5(23.8)	83(20.5)	88(20.7)		
Unemployed	16(76.2)	322(79.5)	338(79.3)		
Total	21(100)	405(100)	426(100)		
Educational Status:				3.76	0.05263
Basic Education	4(19.0)	163(40.2)	167(39.2)		
Not basic education	17(81.0)	242(59.8)	259(60.8)		
Total	21(100)	405(100)	426(100)		
Booking Status:				7.56	
Booked	10(47.6)	350(86.4)	360(84.5)		0.00597
Unbooked	11(52.4)	55(13.6)	66(15.5)		
Total	21(100)	405(100)	426(100)		
Parity				10.52	0.00120
Nulipara	21(100)	297(73.3)	318(74.6)		
Previous delivery	-	108(26.7)	108(25.4)		
Total	21(100)	405(100)	426(100)		

Table 2. Difference in mode of delivery between younger teenage mothers (<16years) and older teenage mothers (16-19years)

Age group	Total		
<16yrs 16-19yrs	N (%)	N (%)	N (%)
Mode of delivery			
SVD	10(47.6)	314(77.5)	324(76.1)
C/S	6 (28.6)	71(17.5)	77(18.1)
Vacuum	5(23.8)	17(4.2)	22(5.2)
Forceps	0(0)	2(0.5)	2(0.4)
Destructive OPS	0(0)	1(0.3)	1(0.2)
Total	21(100)	405(100)	426(100)

RR (95% confidence interval) = 0.29(0.13 – 0.65); X^2 (for SVD) = 10.33; P-value (for SVD) = 0.00176; Remark: statistically significant

3. RESULTS

During the period under review, 453 mothers out of a total 8,297 mothers, who had delivery in EBSUTH, were teenagers giving an incidence of teenage delivery of 5.5%. Only 426 folders with complete information were analyzed. The age range was 13 to19 years the mean age was: 17.9 years ± 1.3. Details of the Maternal and fetal outcome following delivery in younger and older teenage mothers are available in Table 3. Details of the Booking status and delivery outcome are presented in Table 4.

Table 3. Maternal and fetal outcome following delivery in younger (<16 years) and older (16-19 years) teenage mothers

Outcome parameter	Study group			R.R. (95% C1)	P-Value
	<16years n (%)	16-19yrs n (%)	Total n (%)		
Blood Loss				0.91(0.08-0.42)	<0.01
< 500ml	12(57.1)	362(89.4)	374(87.8)		
≥500ml	9(42.9)	43(10.6)	52(12.2)		
Total	21(100)	405(100)	426(100)		
Fetal Birth Weight:				1.72(0.73-4.03)	< 1.89
<2.5kg	8(38.1)	102(25.2)	130(30.5)		
2.5-<4.0kg	13(61.9)	294(72.6)	287(67.4)		
≥ 4.0kg	- -	9(2.2)	9(2.1)		
Total	2 1(100)	405(100)	426(100)		
Apgar Score:				0.45(0.18-1.08)	0.068332
≥8	12(58.3)	306(75.5)	318(74.7)		
5 -7	5(25.0)	42(10.3)	47(11.0)		
<5	- -0(0)	25(6.2)	25(5.6)		
0	4(16.7)	32(8.0)	36(8.7)		
Total	21(100)	405(100)	426(100)		

Table 4. Booking status and delivery outcome: mode of delivery, apgar score and estimated blood loss (EBL)

	Booking status			X^2	p-value
	Booked N (%)	Unbooked N (%)	Total N (%)		
Mode of delivery:				43.037	<0.001
SVD	288(79.9%)	32(48.6%)	320(74.8%)		
C/S	46(12.9%)	28(42.9%)	75(17.8%)		
Vacuum	23(6.3)	5(7.1%)	27(6.5%)		
Forceps	3(0.8%)	0(0%)	3(0.7%)		
Destructive OPS	0(0%)	1(1.4%)	1(0.2%)		
Total	360(100%)	66(100%)	426(100%		
Apgar score:				56.572	<0.001
≥8	291(80.8%)	30(45.1%)	321(74.9%)		
6-7	34(9.6%)	10(15.5%)	46(10.6%)		
-5	18(4.9%)	4(9.9%)	25(5.7%)		
1-3 -	-	- -	-		
0	17(4.7%)	20(29.6%)	37(8.7%)		
Total	0(100%)	66(100%)	426(100%)		
EBL				18.929	<0.001
<500	337(93.6%)	51(77.3%)	388(91.1%)		
500-1000	20(5.6%)	12(18.2%)	32(7.5%)		
≥1000	3(0.8%)	3(4.5%)	6(1.4%)		
Total	360(100%)	66(100%)	426(100%)		

Most of the teenage mothers were 16-19 years (94.7%) while the remaining 5.3% were less than 16 years. The numbers who were married were 262(61.5%). Only 167(39.2%) acquired basic education (to the point of obtaining their junior secondary School certificate). The

number employed were 88(20.7%). These consisted of junior workers: office attendants, messengers, petty traders, artisans and sales ladies. Most of these parturient were booked, (84.5%) while 15.5% were unbooked.

The mean hospital stay after delivery was 4.7 days ± 1.2 days: older teenage mothers being 4.3 ± 0.8 days, while the younger teenage mothers were 7.9 ± 2.2 days. Booked patients had an average hospital stay of 4.2 ± 0.7 days, as opposed to 9.1 ± 2.0 days for the unbooked. There was no record of maternal mortality. There were 36 still births giving a still birth rate of 87 per 1000 deliveries.

4. DISCUSSION

Teenage mothers accounted for 5.5% of deliveries in the study. This is higher than 1.6% in Jos and 21.8 per 1000 deliveries at Nnewi (Muhitir and Maduka, 2006) but lower than 11.8% in Sokoto (Nwobodo and Adoke, 2005), 9.9% in Illorin (Nwobodo and Adoke, 2005; Muhitir and Maduka, 2006; Igwegbe and Udigwe, 2001). This agrees with the fact that incidence of teenage delivery vary from one region of Nigeria to the other and even in the same region (Allan Guttmatcher Institute, 2004). The unexpectedly lower value in Jos may stem from the fact that only teenage primiparae were documented in the study cited.

The finding of a more favourable maternal and fetal parameters which were however not consistently statistically significant in older teenage deliveries compared to younger teenage mothers, agrees with studies that implicate non utilization of prenatal care rather than age in poorer teenage pregnancy outcome (Loto et al., 2004; Akinala et al., 2001; Mahfouz et al., 1995; Restrepo-Mendez et al., 2011). Other studies however implicate age and utilization of antenatal services alike (Akande, 2009; Nwobodo and Adoke, 2005; Ebeigbe and Gharoro, 2007; Lopoo, 2011). It is possible that while this comparative age related risks exist, they may have been over-emphasized and over-reported owing to surrounding confounding socio-economic factors. The younger teenage mothers in the study were less likely to be married, less likely to have a basic education and therefore more likely to be unbooked. One is therefore not surprised at a greater blood loss in this younger group as abdominal delivery was higher. Hospital stay was also longer among them, almost doubling the value in the older group.

This study found a statistically significant favourable obstetric performance among booked teenage mothers compared to their unbooked counterparts. Booking has been shown all over the world as a single factor which improves feto-maternal outcome and reduces maternal/perinatal morbidity/mortality. There was also, high incidence of booking in this teenage population, contrary to the assertion by other studies that most teenage mothers either do not book or present late in pregnancy (Trivedi and Pasrija, 2007; Jimoh and Abdul, 2004; Magadu et al., 2007). The high incidence of booking in this study may be attributed to the free maternity services of the State Government during the period of study. The finding of the statistically significant improvement in maternal and fetal outcome in the booked teenage mothers compared to the unbooked agrees with other reports which compared booked and unbooked teenage mothers (Mayor, 2004; Ebeigbe and Gharoro, 2007; Muhitir and Maduka, 2006; Igwegbe and Udigwe, 2001; Magadu et al., 2007; Ujah et al., 2005). This may be explained by the fact that booked parturient have better access to skilled obstetric care, receive antenatal haematinics and are under closer obstetric surveillance.

The shortcoming of this study is based on the fact that it is an institutional-based study and therefore may not represent the general population of teenage pregnant mothers that are neglected and denied health services and who are languishing in the villages.

5. CONCLUSION

The incidence of teenage delivery in this study is 5.5%. While the biological factors may be of essence in determining the outcome of teenage delivery, it is interesting to observe that access to skilled obstetric care may after all be the major determinant of delivery outcome among teenagers. All efforts should therefore be geared towards ensuring that all obstacles to skilled obstetric care for teenagers are eliminated.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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