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Outcomes in Unbooked Pregnancies Managed in a Tertiary Hospital in Nnewi, Nigeria

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Abstract

Background: *Non-utilization of antenatal care continued to be the leading cause of maternal death among women of reproductive age arising from complications of pregnancy and childbirth. However, in view of the prevailing maternal and perinatal mortality situation in Nigeria, it is imperative to periodically determine and appraise the relationship between the antenatal status of mothers and their respective maternal and fetal outcomes.*

Objectives: *This was to compare the socio-demographical characteristics, obstetrics complications and fetal outcomes in unbooked and booked pregnancies.*

Methods: *This retrospective cross-sectional comparative study involved the case files of the unbooked and booked pregnant women who delivered singleton, in labor ward or referred after delivery at Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-East Nigeria, between January 1st, 2020 and June 30th, 2020. The information obtained from the case files were socio-demographic data such as the age and parity including the maternal and perinatal outcomes. The data obtained were compared with the booked using statistical package SPSS version 26. The significant independent risk factors and correlates, for maternal complications and poor perinatal outcome were identified using binary logistic regression to control for the confounding variables.*

Results: *The total number of deliveries within the period under review was 434, out of which 152 were unbooked; hence the prevalence of unbooked cases was 35.0%. Of these 434 deliveries, only 341 case notes were retrieved from the record department.*

A greater proportion of the teenage patients (<20years) were unbooked as compared with those in the age of 20-34years and ≥35years (75% vs. 35% and 32% respectively; P=0.220) although not statistically significant. There was a significant proportion of grandmultiparous women who were unbooked compared with the nulliparous and the multiparous (50% vs. 41.1% and 29.5% respectively; P-value 0.025). The most frequent maternal complications observed were severe pre-eclampsia/eclampsia (39.7%) and obstetric hemorrhage (24.6%). The chance of the unbooked patients developing maternal complication was noted to be about 5 times that of the booked patients.

Conclusion*: This study reappraises the significance of appropriate antenatal care and delivery towards reducing maternal and perinatal mortality in Nigeria. Booking should also be made more women friendly and women that are unable to afford the cost of antenatal care could be treated as indigent and offered free services where necessary. A further study will be needed in this group of women to determine any physical, economic and cultural barriers to antenatal care, which this retrospective case control study was unable to elucidate.*

Keywords: Pregnancies, Unbooked, Maternal and Fetal Outcomes, Reproductive, Obstetrics.

Abbreviations: APH= Antepartum hemorrhage; PPH= Postpartum hemorrhage

Introduction

Antenatal care is an important component of maternity care. In many parts of the world, midwives are the primary caregivers for childbearing women, providing a high level of continuity of care during a normal pregnancy [1]. While in Nigeria, obstetricians are the primary providers of antenatal care for all childbearing women in tertiary level hospitals; and midwives only provide intrapartum care to laboring women [1-3]. Therefore, booking for antenatal care is concerned mainly with prevention, early diagnosis and treatment of general medical and pregnancy associated disorders that could lead or predispose to maternal and fetal demise [4-6]. This form of care for pregnant women has become an important pillar in the safe motherhood programme, as the aim is to improve the outcome of pregnancy for both the mother and the fetus [5-7].

Majority of maternal complications and fetal deaths occur either before or during childbirth, and yet many women do not receive the essential health care they need during these periods because of their non-utilization of antenatal care [7]. Nevertheless, this trend has continued to create a tight spot for many practicing obstetricians and other health care providers. The big question is: why are the unbooked women not highly concerned with attending antenatal care? How could failure of attendance at antenatal care influence the outcomes of pregnancy, especially in the prevailing high maternal and perinatal mortality and morbidity in Nigeria [8]?

Some authorities may argue that booking for antenatal care does not need or require health care providers' attention [9]. Some authorities have also argued that booking or non-booking for antenatal care does not make any obstetric difference [9-11]. Much to the contrary, it has been shown that the unbooked mothers contribute very substantially to the perinatal morbidity and mortality of the average obstetrics unit [8, 12, 13]. Therefore, if a mother does not book for antenatal care in the hospital, there may be little that can be done to ensure a favorable outcome.

Yet, in Nigeria, maternal mortality ratio and perinatal mortality rate remain as high with quality antenatal care as one of recommended reduction index [14]. Additionally, the maternal and perinatal outcomes of unbooked pregnancies in Nnewi, Nigeria have remained largely uninvestigated and greater proportions of our antenatal population are unbooked.

This study therefore is aimed at comparing the socio-demographical characteristics, obstetrics complications and fetal outcomes between the unbooked and booked pregnancies that were managed at the Nnamdi Azikiwe University Teaching Hospital (NAUTH), Nnewi, South-east Nigeria.

Methods

Study Design

A retrospective cross-sectional comparative study.

Study Population

The study was conducted among pregnant women that had unbooked for antenatal care status. The "booked" (those who received antenatal care, at least once, in our facility formed the control population.

Study Site

Obstetrics and Labor ward of Nnamdi Azikiwe University Teaching Hospital, Nnewi, Nigeria. This hospital has many consultant obstetricians, trainee doctors (registrars and senior registrars) and ancillary medical staff. It is a training center for medical post-graduate studies in Nigeria. It is a government-funded referral center for maternal and newborn care. It provides wide-ranging emergency obstetric care, and serves as key referral center for maternal and childcare services in south-eastern Nigeria.

Eligibility Criteria

Inclusion Criteria

Those "unbooked" (those pregnant women who had no antenatal care in our facility) who delivered singleton, in our labor ward or referred to us after delivery, between the January 1st, 2020 and June 30th, 2020.

Exclusion Criteria

We excluded women with multiple gestations or chronic medical diseases in pregnancy, who delivered of singleton within this period of study. The cases of missing or incomplete data were also excluded from the study.

Sample Size Determination

The sample size was an all population based study.

Sample Technique

Non-random sampling approach. All available case files were examined.

Study Outcome Measures

Maternal packed cell volume (PCV) and the maternal complications such as severe pre-eclampsia/eclampsia, ante-partum hemorrhage, obstructed labor, post-partum hemorrhage, ruptured uterus and maternal mortality.

Procedures Involved

The main theatre, labor ward and obstetrics theatre records were reviewed to identify women that had "unbooked" status for antenatal care during the study period. The patients' case records were then retrieved from the hospitals' medical record department. For the obstetric variables, data were extracted from the Maternity Registers and medical records by trained data collectors using a data retrieval form. The information obtained from the case files were socio-demographic data such as the age and parity. Other data were the maternal packed cell volume (PCV) and the maternal complications such as severe pre-eclampsia/eclampsia, ante-partum hemorrhage, obstructed labor, post-partum hemorrhage, ruptured uterus and mortality. Any woman who had any of the above complications was said to have maternal complication. Data on the mode of delivery, fetal outcome such as intra uterine fetal death, APGAR score at one minute and birth weight were also collected. One-minute APGAR score <7 was

regarded as asphyxia, gestational age <37 as preterm and birth weight of <2.5kg as low birth weight. Any baby with any of these complications was regarded as having poor perinatal outcome. Completed forms were then assessed by a data coordinator at the hospital for completeness and accuracy before being entered digitally into the Excel spread sheet by the data entry and management team.

Statistical Analysis

The cleaned data were exported to Statistical Package for Social Sciences (SPSS) version 26 (IBM Corp.) for analysis. The patients were analyzed for variables such as age, parity, booking status, gestational age at delivery, recognized risk factors, route of delivery, perinatal and maternal outcome. The information was obtained and recorded in proforma. We used descriptive statistics to compare the socio-economic and obstetric characteristics of women with unbooked status and applied the Pearson chi-squared test for categorical variables to determine statistically significant differences between the groups. All significance tests were two sided; a p value of <0.05 was considered statistically significant.

Ethical Approval

The study was approved by the Ethics Review Board of the hospital (reference number: 0162/10/2022; date of approval: 1st October, 2022). The study was conducted according to the Helsinki declarations on ethical principles for medical research involving human subjects.

Results

The total deliveries within this period under review was 434, and out of which, the unbooked was 152; hence the prevalence of unbooked was 35.0%. Of these 434 deliveries, only 341 case notes were retrieved from the record department. Others were either not complete, had chronic medical disease, multiple gestation or the case notes missing. There were 119 unbooked patients (study group) and 222 booked patients (control group).

Table I shows the demographical comparison between the booked and the unbooked. It was found that more proportion of the teenage patients (<20 years) were unbooked as compared with those in the age of 20-34 years and ≥ 35years (75% vs. 35% and 32% respectively; P=0.220) although not statistically significant. There was a significant proportion of grandmultiparous women who were unbooked compared with the nulliparous and the multiparous (50% vs. 41.1% and 29.5% respectively; P=0.025).

The maternal complications were compared between the two groups as illustrated in table II. The odds of the unbooked having antepartum hemorrhage was 7 times (OR=7.25, 95%C.I=2.34-22.55; P<0.001), severe pre-eclampsia/eclampsia was about 3 times (OR=2.8, 95%CI =1.52-5.40; P-value=0.001), obstructed labor about two times (OR=2.14, 95%CI=0.97-4.71; P=0.005) and ruptured uterus 5 times (OR=5.26, 95%CI=1.37-20.15; P<0.001) higher than that of the booked patients. Compared with the booked patients, the unbooked patients had a statistically significant higher incidence of post-partum hemorrhage (PPH) (OR=4.46, 95%C.I=1.35-49.69: P=0.008), blood transfusion (OR=8.95, 95%CI=2.37-49.72; P<0.001) and maternal mortality (OR=4.82, 95%CI=0.93-25.14; P=0.040). The chance of the unbooked patients developing maternal complication was noted to be about 5 times that of the booked patients.

The perinatal outcome and the routes of delivery between the two groups are shown in table III. The unbooked patients had more abdominal delivery than the booked patients (52.9% vs 22.1%; P=0.002). More proportion of babies delivered by the unbooked patients were preterm (36% vs 9%; P<0.001) and low birth weight babies (29.40% vs. 9.91%; P<0.001). The unbooked patients had more incidence of birth asphyxia (OR=3.05; 95%CI=1.45-6.42; P=0.002) and intra uterine fetal death (IUFD) (OR=15.24, 95%CI=5.19-44.76; P<0.001) than the booked. The unbooked had about 4 times odds of delivering a baby with poor perinatal outcome than the booked.

Shown in table IV was the percentage distributions of the maternal complications observed among both the booked and unbooked patients. The most frequent maternal complications observed were severe pre-eclampsia/ eclampsia (39.7%) and obstetric hemorrhage (24.6%) while obstructed labor and ruptured uterus contributed 21.4% and 8.7% to maternal complications respectively.

Table V depicted the perinatal complications among the babies delivered during this period of study. Preterm birth (34.6%) and low birth weight (31.3%) constituted the highest contributors of poor perinatal outcome while birth asphyxia and IUFD contributed 17% and 16.5% respectively.

The significant/independent risk factors for maternal complications and poor perinatal outcome are highlighted in tables VI and VII respectively. Booking status is the only significant risk factor for maternal complications after adjusting for the confounding variables (PCV, parity and age). After the adjustment, the risk of the unbooked patient developing maternal complication remained statistically significant at more than 3 times that of the booked (AOR=3.75, 95%CI=0.090-0.793: P=0.017). In table VII, only maternal PCV and booking status were noted to be significant risk factors for poor perinatal outcome after adjusting for the confounding variables. Increasing PCV reduced the odds of having poor perinatal outcome (AOR=0.871, 95%CI=1.010-1.303, P=0.035) whereas, the unbooked status increased the odds of poor perinatal outcome about 4 times that of the booked (AOR=4.016, 95%CI=0.075-0.833; P=0.024) after adjusting for the confounding factors.

Table I: The demographical features of the booked and the unbooked patients.

Variables		Booked	Unbooked	P-value
1. Age	<20years	1(25.0)	3(75.0)	
	20-34years	173(65.0)	93(35.0)	0.220
	≥35years	48(67.6)	23(32.4)	
2. Parity	0	66(58.9)	46(41.1)	
	1-4	142(70.6)	59(29.4)	0.025
	≥5	14(50.0)	14(50.0)	

Table II: Maternal complications of the booked and the unbooked patients

Variables	Booked (%)	Unbooked(%)	OR	95% C.I	P-Value
Antepartum hemorrhage	4(1.8)	14(11.8)	7.27	2.34-22.55	<0.001
Preeclampsia/eclampsia	22(9.9)	28(23.5)	2.80	1.52- 5.14	0.001
Obstructed labor	13(5.9)	14(11.8)	2.14	0.97-4.71	0.054
Ruptured uterus	3(1.4)	8(6.7)	5.26	1.37-20.15	0.007
PPH	4(1.8)	9(7.6)	4.46	1.35-14.75	0.008
Blood transfusion	3(1.4)	13(10.9)	8.95	2.37-49.69	<0.001
Mortality	2(0.9)	5(4.2)	4.82	0.93-25.14	0.040
Maternal complication	34(15.3)	55(46.2)	4.75	2.85-7.92	0.001

Table III. Fetal outcome of the booked and the unbooked patients

Variables	Booked (%)	Unbooked(%)	OR	95%CI	P -value
1. Cesarean section	49(22.1)	63(52.9)	3.97	2.46-6.41	0.002
2. Intra uterine fetal death	4(1.8)	26(21.8)	15.24	5.19-44.76	<0.001
3. Asphyxia	13(5.9)	19(16.0)	3.05	1.45-6.42	0.002
4. Low birth weight	22(9.9)	35(29.4)	3.79	2.02-7.19	<0.001
5. Preterm delivery	20(9.0)	43(36.1)	5.71	3.17-10.32	<0.001
6. Poor Perinatal Outcome	44(20.0)	62(52.1)	4.35	2.59-7.30	<0.001

Table IV: The Maternal complications observed and their percentages

Complications	No.	Percentages
1. Antepartum hemorrhage	18	14.3
2. Severe Preelampsia/Eclampsia	50	39.7
3. Obstructed Labor	27	21.4
4. Ruptured Uterus	11	8.7
5. Postpartum hemorrhage	13	10.3
6. Maternal Death	07	5.6
Total	126	100.0

Table V: The determinants of poor perinatal outcome and their percentages

Perinatal outcomes	No	Percentages
1. Preterm birth	63	34.6
2. Low birth weight	57	31.3
3. Birth asphyxia	32	17.6
4. Intra-uterine fetal death	30	16.5
Total	182	100.0

Table VI: Independent/Significant risk factors for maternal complication.

Variables	AOR	95% C.I	P-value
Packed cell volume	0.983	0.914-1.133	0.755
Parity	0.917	0.751-1.581	0.650
Age	1.060	0.841-1.057	0.311
Unbooked status	3.745	0.090-0.793	0.017

Table VII. Independent/Significant risk factors for poor perinatal

Variables	AOR	95%.C.I	P-value
PCV	0.871	1.010-1.303	0.035
Parity	1.221	0.536-1.251	0.355
Age	1.043	0.845-1.088	0.514
Maternal Complication	1.880	0.163-1.743	0.297
Unbooked status	4.016	0.075-0.833	0.024
PCV=Packed cell volume			

Discussion

Antenatal care provides an opportunity for pregnancy complications to be diagnosed early and appropriate intervention instituted [15]. The safest mode of delivery for the mother is determined before labor or early in the course of labor as the case may be. Thus, this study is of interest because of our sub-region's social characteristics, where a high number of women do not access antenatal care. This study has revealed that marital status, age, and occupation play a major role as determinant of antenatal booking in Nnewi, Nigeria as young people constituted 75.0% of the unbooked compared to 35.0% of the booked. This has a direct correlation on the marital status where majority of the unbooked women are unmarried compared to the booked. It is possible that the unmarried young women lack moral and economic empowerment to attend antenatal booking compared to older and married women who may not agree with their spouses in such decision taking [16, 17]. Thus, higher socioeconomic status of the women may be contributory to their desire for antenatal care.

With regard to parity, the influence of it was noticed to be only significant among the grand multiparous women among the unbooked compared to the booked ($p<0.05$). This finding has similarly been observed in other reports [17-19]. This has also been attributed to the overconfidence of the grand multiparas [19]. Higher parity was associated with unbooked pregnancy, possibly as a result of a 'practice makes perfect' attitude on the part of these grand multiparas [19-21]. The number of mothers with poor obstetric histories may be significantly greater in the booked group, giving a picture of high-risk pregnant women selecting themselves and booking early in their pregnancies. This however, was not demonstrated in this study.

This study has also revealed that booking status is the only significant risk factor for maternal complications after adjusting for the confounding variables (packed cell volume, parity and age). Using logistic regression analysis to investigate, in a multivariate manner, the factors that tended to determine the mothers' complication such as age, parity and packed cell volume at labor were selected as the covariant that significantly related to this. After the adjustment, the risk of the unbooked developing maternal complication remained statistically significant at more than 3 times that of the booked (AOR=3.75; 95%CI=0.090-0.793; P=0.017).

Expectedly, women who were unbooked are often referred to the teaching hospital or other delivery centers when complications have occurred either during pregnancy or labor. This could explain the significant difference between the unbooked and the booked with regard to cesarean delivery, preterm deliveries, low birth weight, birth asphyxia and intra uterine fetal deaths. The same factor might explain the overwhelming maternal mortality rate difference of the unbooked compared to the booked observed in this present report.

In the present study, over 80% of the unbooked patients had various complications of pregnancy, labor and delivery. Some of them had multiple pathologies requiring urgent management. Pre-eclampsia labor and obstructed labor were the commonest maternal complications. Other problems at presentation included intrauterine antepartum hemorrhage (14.3%), uterine rupture (8.7%) and postpartum haemorrhage (10.3%). Pre-eclampsia and other complications have been reported to be common in the unbooked mother [17].

One limitation of this study was that, because of small numbers, we were unable to control for the presence of antenatal risk factors which, like birth weight and gestational age, also influence the perinatal outcome.

Conclusion

This study underscores the importance of proper antenatal care and delivery towards reducing maternal and perinatal mortality in our environment. This should be particular to the vulnerable group such as the young women, unmarried and grand multiparas. Booking should also be made more women friendly. Women who are unable to afford the cost of antenatal care should be identified and could be treated as indigent, and offered free services where necessary. A further study will be required in this group of women to determine any physical, economic and cultural barriers to antenatal care, which this retrospective study was unable to explain. The proposed identified barriers would give insight to potential planning strategies to reach out to women under-served by antenatal care.

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Author Contributions
CBO, LUO, CGO and GUE were involved in the overall conceptual design and implementation of the project, and overall revision of the manuscript. COE, BUO, SON, JCN, and CAO contributed to data collection, analysis, and manuscript writing. MEN, KEE, VVO, EPI and JII were involved in the writing of this manuscript and overall revision. The authors read, approved the final manuscript, and agreed to be accountable for all aspects of the work.

Disclosure Statement for Publication
All authors have made substantial contributions to conception and design of the study, or acquisition of data, or analysis and interpretation of data; drafting the article or revising it critically for important intellectual content; and final approval of the version submitted. This manuscript has not been submitted for publication in another journal.

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Ethical Approval and Consent to Participate
The study was approved by the Ethics Review Board of the hospital (Reference number: 0162/10/2022). Informed consent was not sought for the present study because it was a retrospective study of cases. The waiver for the consent was taken from the Institutional Review Board.

Conflict of Interest
The authors declare that they have no conflict of interest.

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