

Born Too Soon; Implications in a Tertiary Health Facility in Enugu State Nigeria

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ABSTRACT

Background: Preterm birth (PTB) is a complex complication of pregnancy with multiple etiologies. This results in long term medical burdens to the families and health care system at large. The objective of the study was to determine the socio-demographic and obstetric characteristics that affect preterm delivery.

Methods: The study was a prospective cohort study conducted at the Obstetrics and Gynecology Department of a tertiary health facility in Nigeria. Data for the study were retrieved from the ante-natal and delivery card of the women that delivered at the unit within the time of data collection. Data was analyzed using SPSS version 25 and variables were presented as frequencies, percentages, means, and standard deviation. Bivariate analysis was done using chi-square test. The level of significance was set at p value ≤ 0.05 . Binary logistic regression was used to determine factors that predicted preterm delivery.

Results: Majority of them were married 746(96.9%), Igbos 763(99.1) and Christians 766(99.5%). Most of the women were civil servants 429(55.7%), while about 31.3% of them were unemployed 241(31.3%). Majority of the women 484(62.9%) had tertiary education. About 48% of them delivered through caesarean section while 53.9% booked within 14-28weeks gestation.

Delivering through caesarean section and gestational age at booking predicted preterm delivery. Un-booked mothers have about 7times odds of having PTB when compared to those that booked at ≥ 28 week's gestation.

Conclusion: The prevalence of PTB is still high in Nigeria. Booking status of the mother and C/S delivery were found to be strongly associated with preterm delivery.

Key words: Enugu State, Nigeria, Preterm delivery, Prevalence, Tertiary health facility

INTRODUCTION

Preterm birth (PTB) remains a complex health problem and its complications are considered the leading cause of death among children under five years of age. [1] According to the World Health Organization (WHO), every year an estimated 15 million babies are born preterm (<37 weeks of gestation) and this

global trend is rising. Among 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born. [2] There is a reported trend of preterm birth rate from 9.8% (8.3–10.9) in 2000 to 10.6% (9.0–12.0) in 2014. [3] Also majority (81.1%) of the estimated 14.84 million preterm births in 2014 occurred in Asia and sub-Saharan Africa. [3] PTB is caused by multiple aetiologies as

there are individual and environmental factors which contributes to it and makes the prediction and prevention of PTB a challenging process during antenatal care. [4]

In 2015, the complications of PTB were responsible for approximately 1 million deaths. [1] A variety of factors including demographic and socioeconomic status have been reported to be associated with preterm birth such as maternal age, parity, previous preterm birth, multiple gestation, pregnancy induced hypertension, antepartum hemorrhage, prolonged pre-labor rupture of membranes, and urinary tract infections. [5]

PTB contributes to about 11% of annual birth worldwide. [6] It is the leading cause of neonatal morbidity and mortality; and the second most leading cause of under-five death in the world. [7, 8] Previous studies have reported risk factors for preterm delivery including extreme maternal age (<20 or ≥35 years), living without partner, living in rural area, stress, heavy physical work, low education level, underweight, overweight and obesity. [7, 9] In addition, poor attendance to ANC, antepartum hemorrhage, diabetes, preeclampsia, fetal growth retardation, preterm premature rupture of membranes, multiple pregnancy, and maternal infections have also been associated with an increased risk of preterm delivery. [9-12]

PTB remains a complex health problem. Risks for PTB vary according to ethnicity, geography and factors related to lifestyle. [13] Recent studies have shown that preterm complications cause 29% of neonatal deaths and are responsible for significant morbidity after birth. [14, 15] Prematurity may exert a negative impact on the family sequel to loss of the baby, emotional distress on the family and enormous medical costs associated with the use of different therapeutic resources. As a result of technological advances and improved medical care, many preterm infants survive with less disability. However, these children may remain

vulnerable to long-term complications which can last throughout their lifetime. [16]

In 75% of cases, preterm birth is spontaneous and has a multifactorial origin. It appears that risk factors vary according to gestational age, as well as social and environmental aspects. [17]

This study aimed to determine the socio-demographic characteristics and obstetric factors associated with preterm delivery among women who delivered at the Obstetrics and Gynecology Department (O&GD) of a tertiary health facility in Enugu State Nigeria. The study findings are critical in identifying women at risk of PTB, developing prevention and management plans to help reduce the adverse outcomes associated with PTB. The interventions may help to improve newborn' survival rates in our setting.

METHODOLOGY

Study area

The study was carried out at the O&GD of Enugu State University Teaching Hospital (ESUTH) Park Lane Enugu. ESUTH is one of the tertiary health facilities in Enugu State, Nigeria that provides tertiary services for patients within the state and neighboring States. It also serves as a referral center for both public and private health facilities within and outside the State. It is located within the heart of the State.

Study design

A Prospective cohort study that lasted for 7 months

Study population

All the women that delivered at the O&GD of ESUTH Park Lane Enugu within the time of data collection.

Inclusion criteria

All the women that delivered at the O&GD of ESUTH Park Lane Enugu within the time of data collection were included in the study.

Exclusion criteria

Women who delivered pre term babies with unknown gestational age

Data collection methods

Data was collected for a period of 7 months (1st July 2020-31st January 2021). Two research assistants (5th year medical students) were used for data collection. Data from the ante-natal and delivery cards were retrieved and entered on a structured pro forma. This was done daily throughout the period of data collection.

Data management

Independent variable

Socio-demographic and obstetric characteristics.

Dependent variables

Preterm birth

Statistical analysis

All the data were imputed into IBM Statistical Package for Social Sciences (SPSS) version 25 and edited for errors by generating frequencies. Categorical variables were summarized using frequencies and percentages. Chi-squared test was used to test for associations between socio-demographic and obstetric characteristics and preterm birth with significant level placed at p-value ≤ 0.05 . Significant variables on bivariate analysis were imputed for multivariate logistic regression. Odds ratio together with their corresponding p values and confidence intervals were computed.

Ethical considerations

Ethical clearance for the study was obtained from the Research and Ethics Committee of ESUTH Park lane Enugu. Anonymity was maintained by ensuring that no name reflected on the structured pro forma. Confidentiality was maintained by keeping all the data in a safe.

RESULTS

Table 1: Socio-demographic and obstetric characteristics of the mothers

Variable	Frequency	Percentage
Age in years		
Mean \pm SD	29.76 \pm 4.69	
Age in groups		
≤ 20	14	1.8
21-30	431	56.0
31-40	318	41.3
41-50	7	0.9
Marital status		
Married	746	96.9
Single	24	3.1
Ethnicity		
Igbo	763	99.1
Others	7	0.9
Religion		
Christianity	766	99.5
Islam	4	0.5
Occupation		
Civil servants	429	55.7
Agricultural workers	6	0.8
Crafts and related trade workers	83	10.8
Unskilled workers	11	1.4
Unemployed	241	31.3
Educational level		
Tertiary	484	62.9
Secondary completed	281	36.5
Primary completed	5	0.6
Parity		
1-2	531	69.0
3-4	196	25.6
≥ 5	43	5.4
Anaemia (delivery)		
Yes	303	39.4
No	467	60.6
Caesarean Section		
Yes	368	47.8
No	402	52.2
Booking GA in group	N=770	
Un-booked	146	19.0
≤ 13 weeks	61	7.9
14-28 weeks	415	53.9
≥ 28 weeks	148	19.2
GA at delivery		
< 37 weeks	94	12.2
≥ 37 weeks	676	87.8

GA Gestational age

Table 1 shows the socio-demographic and obstetrics characteristics of the mothers. Most of the mothers were aged 21-30years 431(56.0%). Majority of them were married 746(96.9%), Igbo 763(99.1) and Christians 766(99.5%). Most of the women were civil servants 429(55.7%), while about 31.3% of them were unemployed 241(31.3%). Majority of the women 484(62.9%) had tertiary education. About 48% of them delivered through caesarean section while 53.9% booked within 14-28weeks gestation.

Table 2: Factors that affected preterm birth

Variable	Preterm		χ^2	P value
	No	N (%)		
Age in groups				
≤20	10 (71.4)	4 (28.6)	3.631	0.304
21-30	379 (87.9)	52 (12.1)		
31-40	281 (88.4)	37 (11.6)		
≥41	6 (85.7)	1 (14.3)		
Marital status				
Married	657 (88.1)	89(11.9)	1.720	0.190
Single	19(79.2)	5(20.8)		
Ethnicity				
Igbo	669(87.7)	94(12.3)	0.982	0.806
Yoruba	1(100)	0(0.0)		
Hausa	5(100)	0(0.0)		
Others	1(100)	0(0.0)		
Religion				
Christianity	672(87.8)	94(12.2)	0.700	0.705
Islam	4(100)	0(0.0)		
Occupation				
Civil servants	374(87.2)	55(12.8)	5.003	0.287
Agricultural workers	4(66.7)	2(33.3)		
Crafts and related trade workers	71(85.5)	12(14.5)		
Unskilled workers	9(81.8)	2(18.2)		
Unemployed	218(90.5)	23(9.5)		
Educational level				
Tertiary	434(89.7)	50(10.3)	4.386	0.112
Secondary completed	238(84.7)	43(15.3)		
Primary completed	4(80.0)	1(20.0)		
Parity				
1-2	464(87.4)	67(12.6)	0.613	0.736
3-4	175(89.3)	21(10.7)		
>4	37(86.0)	6(14.0)		
Anaemia (delivery)				
Yes	261(86.1)	42(13.9)	1.275	0.259
No	415(88.9)	52(11.1)		
Caesarean Section				
Yes	308(83.7)	60(16.3)	11.037	0.001*
No	368(91.5)	34(8.5)		
Booking GA in group				
Un-booked	99(67.8)	47(32.2)	68.560	<0.001*
≤13 weeks	59(96.7)	2(3.3)		
14-28 weeks	380(91.6)	35(8.4)		
≥28 weeks	138(93.2)	10(6.8)		

GA Gestational age * Statistically significant

Table 2 shows factors that affected preterm birth. Delivering through Caesarean section ($\chi^2=11.037$, $p=0.001$) and gestational age at booking ($\chi^2 =68.560$, $p=<0.001$) significantly affected PTB.

Table 3: Predictors of preterm birth

Variable	Odds ratio	P value	95% CI for odds ratio	
			Lower	Upper
Marital status				
Married	1.1601	0.395	0.540	4.745
Single	1			
Educational level				
Tertiary	1.663	0.666	0.166	16.668
Secondary completed	1.497	0.730	0.151	14.855
Primary completed	1			
Caesarean Section				
Yes	0.523	0.007*	0.328	0.836
No	1			
Booking GA in group				
Un-booked	6.712	<0.001*	3.144	14.327
≤13 weeks	0.460	0.327	0.097	2.174
14-28 weeks	1.213	0.606	1.213	0.583
≥28 weeks	1			

GA Gestational age * statistically significant

Delivering through caesarean section and gestational age at booking predicted preterm birth. Un-booked mothers have about 7 times odds of having PTB when compared to those that booked at ≥ 28 week's gestation.

DISCUSSIONS

The prevalence of PTB in the present study was 12.2% (122 per 1000 births). This is high considering the fact that PTB is associated with most of the pregnancy-related mortality with its short and long-term disabilities. [18] A similar study in a tertiary health facility also reported a similar prevalence of 12.0%. [19] Both studies were conducted in tertiary health facilities with similar characteristics and that can explain the similarity. Other studies however, reported lower findings in Nigeria (8.5%), [20] Italy (7.8%) [21] and Abu Dhabi UAE (6.3%). [22] Moreover, the prevalence in the present study was lower than the WHO 'Born Too Soon' report for Nigeria which estimated PTB to be 15%. [23] Better and supervised ante-natal services in the present study site may explain the difference.

The differences in prevalence rates could also be explained by the nature of the studies, for instance, delivery at tertiary health facilities may be associated with high preterm births due to dealing with complicated pregnancies and referral from other centres, unlike some studies that are community-based. [24, 25] Another study from Nigeria also reported a higher prevalence of 16.9%. [26] The higher prevalence in this study may be due to the fact that they included multiple gestation in their study and included data from the neonatal intensive unit which may include pre terms that were delivered outside the hospital but were referred to the tertiary health facility for expert care.

Our study did not find any statistically significant association between extreme maternal age and PTB. However other studies have documented that extreme maternal age is associated with PTB. [5, 27]

The difference may be explained by the special care given to this group of mothers in the tertiary health facility knowing that they are high risk pregnancies.

Also there was no statistically significant association between being single and PTB in our study though some other studies have reported such association. [7, 9] The socio-demographic characteristics of the women that delivered at the hospital may explain the difference.

Our study found out that delivery through Caesarean Section (C/S) was associated with PTB. About 16.3% of babies delivered through C/S were PTB. This may be due to the fact that mothers who deliver through caesarean section have other pregnancy complications that may be an indication for the caesarean section. This was corroborated by other studies from UAE [22] and Brazil. [28]

Booking status of the mothers predicted PTB as un-booked mothers had about 7 times odds of PTB when compared to the booked mothers. Other studies from Nigeria [29] and United Kingdom [30] corroborated the finding.

Lack of booking and poor prenatal care has been reported to negatively affect pregnancy outcome, such as increased maternal mortality, complicated maternal emergency, and perinatal mortality. [31] Early identification of risk factors in pregnancy is an essential component of good obstetric care and early interventions may be effective in mitigating against the risk of PTB. Prevention of PTB is a public health challenge that aims to reduce the infant and childhood morbidity and mortality. [32]

CONCLUSION

The prevalence of PTB is still high in Nigeria. Booking status of the mother and C/S delivery were found to be strongly associated with PTB. Strategies should be put in place to educate prospective mothers on the importance of early booking and dangers of late booking or not booking at all.

Limitations

There might have been an underestimation of the prevalence of PTB as the study excluded multiple gestations which is known to result in PTB most times. There might also have been an over estimation of preterm delivery as the institution is a referral center and thus handles complicated cases from peripheral hospitals.

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