Prevalence and risk factors for preterm delivery in UNIOSUN Teaching Hospital, Osogbo - A 5 year retrospective review

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Abstract

Introduction: Preterm delivery is the leading cause of death in the neonatal period. It causes 28% of perinatal mortality. In Nigeria, it is responsible for 40-60% of perinatal morbidity. According to a U.S. research, preterm births have surged globally. In 2016, 16.8% of singleton live births in Lagos, Nigeria, were preterm.

Methods: It was a retrospective review of patients with singleton preterm delivery in UNIOSUN Teaching Hospital, Osogbo from July 2013 to June 2018. Case records of mothers/patients with preterm deliveries were retrieved. Information on the patients' age, parity, educational status, weight, body mass index, number of antenatal visits, identifiable causes of preterm delivery and others were all extracted.

Result: During the research period, 2,234 babies were born, including 210 preterm singletons out of which 147 were reviewed. Singleton preterm birth prevalence was 9.4%.Of the 147 mothers, n (20.4) had premature rupture of membrane (PROM), hypertensive disorders in pregnancy occurred in n(17.0%), Urinary Tract Infection (10.8%) and malaria in pregnancy (6.1%).

Conclusion: Preterm birth rates were low compared to recent rates in the country. PROM, malaria in pregnancy, UTI in pregnancy, hypertensive disorders in pregnancy and previous history of spontaneous miscarriage were important causes/risk factors for preterm delivery.

Keywords: Preterm delivery, Causes, Risk factors, Prevalence

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Prévalence et facteurs de risque d'accouchement prématuré à l'hôpital universitaire UNIOSUN, Osogbo : Un bilan rétrospectif sur 5 ans

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Résumé

Objectif de l'étude: L'accouchement prématuré est la première cause de décès en période néonatale. Elle est à l'origine de 28 % de la mortalité périnatale. Au Nigéria, elle est responsable de 40 à 60 % de la morbidité périnatale. Selon une étude américaine, les naissances prématurées ont augmenté dans le monde. En 2016, 16,8 % des naissances vivantes uniques à Lagos, au Nigéria, étaient prématurées.

Méthode de l'étude: Il s'agissait d'un examen rétrospectif des patientes ayant accouché prématurément d'un singleton à l'hôpital universitaire UNIOSUN d'Osogbo de juillet 2013 à juin 2018. Dossiers de cas de mères/patientes les accouchements prématurés ont été récupérés. Les informations sur l'âge des patientes, la parité, le niveau d'éducation, le poids, l'indice de masse corporelle, le nombre de visites prénatales, les causes identifiables d'accouchement prématuré et autres ont toutes été extraites.

Résultat de l'étude: Au cours de la période de recherche, 2 234 bébés sont nés, dont 210 singletons prématurés dont 147 ont été examinés. La prévalence des naissances prématurées uniques était de 9,4 %. Sur les 147 mères, n (20,4) avaient une rupture prématurée de la membrane (RPM), des troubles hypertensifs pendant la grossesse sont survenus chez n (17,0 %), une infection des voies urinaires (10,8 %) et le paludisme pendant la grossesse (6,1 %).

Conclusion: Les taux de naissances prématurées étaient faibles par rapport aux taux récents dans le pays. La RPM, le paludisme pendant la grossesse, les infections urinaires pendant la grossesse, les troubles hypertensifs pendant la grossesse et les antécédents de fausse couche spontanée étaient des causes/facteurs de risques importants d'accouchement prématuré.

Mots-clés : Accouchement prématuré, causes, facteurs de risque, prévalence

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INTRODUCTION

Preterm delivery is defined as the birth of a neonate before 37weeks in-utero calculating from the first day of last normal menstrual period of the mother. It is a significant perinatal health problem across the globe. Globally, it is the leading cause of death in neonatal period (1). This especially, is a cause of worry to both the parents and the health care giver not only in terms of associated mortality but also with regards to short and long term morbidity

The prevalence of preterm delivery is said to range between 8-15% and it accounts for about 28% of early neonatal deaths that are not related to congenital abnormalities (2,3). In Nigeria, it accounts for 40-60% of all perinatal deaths (3). The prevalence of preterm birth have been reported to be between 5-7% of live births in some developed countries but are estimated to be substantially higher in developing countries (4). In Africa, a study conducted by World Health Organization Global Survey in low and middle income countries showed a prevalence of 8.2% (5).

In the past 20 years, there has been a global increase in the frequency of preterm delivery according to a study done in the United States.(6) Some European studies have reported prevalence of 5-10%.(7) Among the whites, preterm birth increased from 8.8% of live birth in 1989 to 10.2% in 1997, a relative increase of 15.6%.(8) In a recent study conducted in Lagos Nigeria, year 2016 prevalence rate of preterm delivery was 16.8% for singleton live birth deliveries (9). This showed an increase from the prevalence rate of 9.5-15.8% reported for sub-saharan African by WHO in the year 2013 (10).

Studies have identified previous preterm delivery, antepartum haemorrhage, premature rupture of membrane, urinary tract infection, pregnancy induced hypertension, mode of delivery and booking status as determinants of preterm delivery (3). Another study conducted in south western part of Nigeria, identified older maternal age, maternal anemia, maternal illness during pregnancy, previous abortion, nulliparity and low body mass index, non-booking status and hypertensive disorders in pregnancy as having great impact on the gestational age at delivery, with most of the cases of preterm delivery recorded having either as risk factor (3,6).

The aim of this study was to determine the prevalence of preterm delivery and to identify the common cause of this among patients in UNIOSUN Teaching Hospital. The study seeks to look at the current causes of preterm delivery in our hospital, with no recent data on this, and to compare with that of others around. This will go a long way in making appropriate recommendation and make necessary modification to our antenatal and labour ward services.

MATERIALS AND METHODS

The study was carried out in the department of Obstetrics and Gynaecology of UNIOSUN Teaching Hospital, Osogbo. It was a retrospective review of case notes of mothers/patients with singleton preterm delivery in the hospital over a period of 5years; from July 2013 to June 2018. Parturients with multiple gestations were excluded from the study.

Case records of all booked and unbooked cases of preterm deliveries (between gestational age of 28 weeks to 36 weeks 6days) with singleton fetus were retrieved. Information on the patients age, parity, educational status, weight, body mass index, usage of intermittent prophylactic treatment for malaria, number of antenatal visit, history of pre-conceptional chronic illness were taken from the case notes. Other information obtained from the case records includes social habits, identifiable causes of preterm delivery, baby's birth weight and Apgar score at delivery. Extracted data were analyzed with IBM SPSS package version 18 and presented in frequency table, percentage and Chi square used to determine association between different variables.

RESULTS

During the period of the study, total number of deliveries was 2,234 out of which 210 were singleton preterm deliveries. Of the 210 cases, 147 folders were retrieved for this study giving a retriever rate of 70%. The prevalence of singleton preterm delivery during this study was 9.4%.

Mothers' ages ranged from 18years to 44years with the mean age of 31.14years. Eighty seven (59.2%) mothers within ages of 31-40years formed bulk of the study. All the patients have one form of education or the other with most of them having tertiary education 68(46.3%). Most of the patients studied were traders (51%) followed by civil servants (29.9%) as seen in Table 1

About 12.9% of the parturient had previous history of spontaneous miscarriages and 73.7% of them had at least 2 or more episodes of miscarriage. Only one of the patients had history of smoking in pregnancy. Ten (6.8%) had history of consumption of alcohol while one smokes.

Of 147 parturient studied, 25 had febrile

illness in pregnancy accounting for 16.3 %, and this include both malaria and UTI in pregnancy. Majority of the parturient studied had preterm delivery secondary to PROM accounting for about 20.4% followed closely by hypertensive disorders in pregnancy and urinary tract infection which account for 17.0% and 10.8% respectively. Other significant causes from the study are malaria in pregnancy, antepartum haemorrhage and others (Table 2).

Most cases, 67%, of preterm delivery occurred between 32 and 34weeks gestational age and this was mostly among the parturient aged 31-40years (60.6%) and this was statistically significant at p value of 0.047 (Table 3). These same age groups have higher cases of preterm delivery between 28-31weeks and 35-37weeks. Most cases of preterm delivery were seen among the traders, n (50) and this occurs between 32-34weeks. There was no significant relationship between BMI and preterm delivery.

Table 5 showed the association between the identifiable risk factors/causes in this study and preterm delivery. Previous history of preterm delivery, Urinary tract infection in Pregnancy (0.041), Malaria in Pregnancy (0.046), hypertensive disorders in pregnancy (0.034) and previous history of spontaneous miscarriage (0.036) were statistically significant with p value of 0.05.

DISCUSSION

The prevalence of singleton preterm delivery in our centre / the present study was 9.4% and this is comparatively lower than the reported prevalence of 16.8% in a study done in Lagos in 2016 (9) and 11.8% in a study done between 2011-2013 in Ilorin, North Central Nigeria (3). This is significant when compared to the study from Ilorin, given that this study was a 5 year review compare to the 3years review from Ilorin. However, the fact that the study is retrospective may have effect on the result given that we could not retrieve all the 210 folders. The prevalence is also lower when compared with WHO report of 2013 for sub-Saharan Africa (10). This could be evidence of our improved antenatal care services. Patients with age range of 31-40years accounted for about 59.2% of the cases of preterm deliveries studied. This showed an increase in prevalence of preterm delivery with increasing maternal age, when compared with the proportion of the patients less than 31years who had preterm delivery. This was however not statistically significant. Newburn-cook et al in Canada also observed this in a study in 2005 (11).

Likewise, Alice Goisis et al in a study on increase of preterm delivery among mothers ages 35-39 and 40 years compare to that in ages 25-39 concluded that preterm cases increases with maternal age (12).

The parity of the patients in this study also determine the gestational age at delivery as nullipara account for 46.3% n (68), this is similar to findings of Mokuolu et al in 2002 (13). These could be explained by the fact that nulliparous are predisposed to medical disorders like hypertensive disorders in pregnancy. This was supported by the fact that hypertensive disorder in pregnancy was the second common cause of preterm delivery in this study and was statistically significant with a p value of 0.034. More than half of the patients studied were unbooked accounting for about 51% of the total patients studied, this was in consonant with previous studies identifying unbooked status as a risk factor for preterm delivery (14). The risk of preterm delivery is also high in patients with low antenatal clinic visit in this study similar to what was discovered in a similar study in Enugu, southeast Nigeria (14). The use of IPT to prevent malaria in pregnancy was also seen to affect the prevalence of spontaneous preterm delivery as 46.2% of the cases studied did not have any dose of IPT in pregnancy as against 15% in patient that had at least two doses of IPT and 38.8% in patients that had 1 dose. Malaria was also statistically significant as a cause of preterm delivery in this study with a p value of 0.046. This further buttress the fact that IPT is an important part of antenatal care in the tropics as it reduces the placental parasitaemia and by extension malaria in pregnancy for the mother which is a known cause of preterm delivery (15).

Premature rupture of membrane was statistically significant as a cause of preterm delivery in this study. This was also notice to be most important cause in patient who has had previous history of preterm birth. This established the fact in previous study by Mokuolu et al in Ilorin which pointed previous history of preterm delivery, PROM, and spontaneous abortion as a risk factor for preterm delivery (3). About 7% of cases studied had history of consumption of alcohol during pregnancy. This had been known to relatively increase the risk of preterm delivery when compare to pregnant women with no alcohol consumption in pregnancy (15).

Pre-mature rupture of membrane contributes significantly to cases of preterm delivery in this study and this is mostly likely a

complication of infective process in pregnancy. This was supported by the fact that UTI and Malaria in pregnancy contributes significantly to cases of preterm delivery in this study. There was also significant association between antepartum haemorrhage and preterm delivery in Mokuolu et al study in Ilorin.(3) The study also identified maternal socio-demographic and antenatal variables including previous preterm delivery antepartum haemorrhage, premature rupture of membrane, urinary fact infection, pregnancy induced hypertension, type of labour and booking status as determinants of preterm delivery.(3)

The body mass index of the patients both at booking and at delivery and their respective weight have no association with determination of gestational age at delivery in this study. This is contrary to a study in southern California which found that higher BMI up to around 24kg/m^2 is increasingly protective of preterm delivery beyond which a higher BMI becomes detrimental.(17)

CONCLUSION

The study showed the prevalence of preterm delivery to be 9.4%. This is low when compared with the recent prevalence documented in the country. Premature rupture of membrane, malaria in pregnancy, UTI in pregnancy, hypertensive disorders in pregnancy and previous history of spontaneous miscarriage are all discovered to be important causes/risk factors for preterm delivery. It was also observed that most of the patients studied were unbooked, which indicated higher prevalence of preterm delivery among the unbooked compared to the booked patients. We recommend that more efforts should be directed towards the prevention of febrile illness in pregnancy and medical disorders like hypertensive disorders in pregnancy as these were noticed to contribute significantly to cases of preterm delivery in this study. Encouraging pregnant women to book and have proper antenatal clinic visit will also go a long way to reduce the burden of preterm delivery.

Conflict of interest: There are no conflicts of interest

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Table 1: Socio-demographic characteristics of respondents (N= 147)

Variables	Frequency (n)	Percentage (%)
Age (years)		
=20	4	2.7
21-30	54	36.7
31 — 40	87	59.2
>40	2	1.4
Total	147	100.0
Educational status		
Primary	21	14.3
Secondary	58	39.5
Tertiary	68	46.3
Total	147	100.0
Occupation		
Civil servant	44	29.9
Traders	75	51.0
Artisan	2	1.4
Student	16	10.9
Unemployed	10	6.8
Total	147	100.0
Marital status		
Unmarried	3	2.0
Married	144	98.0
Total	147	100.0
Parity		
1	68	46.3
2-4	37	25.2
=5	42	28.6
Total	147	100.0

Table 2: Identifiable Causes preterm delivery

Variables	Frequency	Percentage(%)
Malaria in pregnancy	9	6.1
UTI in Pregnancy	16	10.2
Hypertensive Disorders in Pregnancy	25	17
DM in Pregnancy	5	3.4
Uterine Fibroid	2	1.4
Polyhydraminous	2	1.4
Oligohydraminous	1	0.7
Antepartum Haemorrhage	5	3.4
PROM	30	20.4
Placental Abnormalities	0	0
SCD in Pregnancy	1	0.7
Anaemia in Pregnancy	0	0

Table 3: Association between socio-demographic characteristics and gestational age at delivery

Socio- demographic variables	Gestational age			Statistical parameters
	28-31weeks	32-34Weeks	35-37weeks	
Age (years)				
<20	0(0.0)	2(50.0)	2(50.0)	
21-30	2(3.7)	37(68.5)	15(27.8)	X2=5.923
31-40	3(3.4)	60(69.0)	24(27.6)	Df=6
>40	0(0.0)	0(0.0)	2(100.0)	p-value=0.432
Parity				
1	3(4.4)	46(67.6)	19(27.9)	X2=1.882
2-4	0(0.0)	26(70.3)	11(29.7)	Df=12
=5	2(4.8)	27(64.3)	13(31.0)	p-value=0.047*
Educational status				
Primary	0(0.0)	17(81.0)	4(19.0)	X2=2.638
Secondary	2(3.4)	39(67.2)	17(29.3)	Df=4
Tertiary	3(4.4)	43(63.2)	22(32.4)	p-value=0.620
Occupation				
Civil servant	0(0.0)	29(74.4)	10(25.6)	
Traders	3(4.0)	50(66.7)	22(29.3)	X2=11.212
Artisan	0(0.0)	2(100.0)	0(0.0)	Df=10
Professionals	1(20.0)	2(40.0)	2(40.0)	p-value=0.341
Students /Unemployed	1(3.8)	16(61.5)	9(34.6)	
Marital status				X2=0.122
Single	0(0.0)	2(66.7)	1(33.3)	Df=2
Married	5(3.5)	97(67.4)	42(29.2)	p-value=0.941

*Statistically significant <0.05

Table 4: Association between parturient body mass index and gestational age at delivery

Body Mass Index at booking (kg/m²)	Gestational age			Statistical parameters
	28-31	32-34	35-37	
<17	0(0.0)	8(66.7)	4(33.3)	X^2=8.692
17-25	0(0.0)	31(68.9)	14(31.1)	Df=6
26-30	1(7.7)	5(38.5)	7(53.8)	p-value=0.192
>30	0(0.0)	2(100.0)	0(0.0)	
Body Mass Index at last visit				
<17	0(0.0)	9(56.3)	7(43.8)	X^2=7.301
17-25	0(0.0)	23(71.9)	9(28.1)	Df=6
26-30	1(4.5)	14(63.6)	7(31.8)	p-value=0.294
>30	0(0.0)	0(0.0)	2(100.0)	

Table 5: Association between the risk factors and prematurity according to gestational age.

Variable	Gestational Age at Delivery			X^2 value	p-value
	28-31(%)	32-34(%)	35-37(%)		
Previous history of spontaneous miscarriages					
Yes	1(20.0)	13(13.1)	5(11.6)	6.843	0.036*
No	4(80.0)	86(86.9)	38(88.4)		
Previous history of preterm delivery					
Yes	1(20.0)	6(6.1)	2(4.7)	4.111	0.059
No	4(80.0)	93(93.9)	41(95.3)		
Other Febrile illness					
Yes	1(20.0)	9(1.0)	4(9.3)	6.001	0.063
No	4(80.0)	90(99.0)	39(90.7)		
Malaria					
Yes	0	6(6.1)	3(6.9)	4.992	0.046*
No	5(100.0)	93(93.9)	40(93.1)		
PROM					
Yes	5(100.0)	22(22.2)	3(7.0)	7.147	0.032*
No	0	77(77.8)	40(93.0)		
UTI					
Yes	2(40.0)	10(10.1)	4(9.4)	6.743	0.041*
No	3(60.0)	89(89.9)	39(90.6)		
Hypertensive disorder					
Yes	3(60.0)	18(18.2)	4(9.4)	7.004	0.034*
No	2(40.0)	81(81.8)	39(90.6)		
Diabetes					
Yes	1(20.0)	2(2.0)	2(4.7)	5.979	0.054
No	4(80.0)	97(98.0)	41(95.3)		
Antepartum hemorrhage					
Yes	0	4(4.0)	1(2.3)	5.919	0.057
No	5(100.0)	95(96.0)	42(97.7)		