Mashhad University of Medical Sciences (MUMS)

Reviews in Clinical Medicine

Clinical Research Development Center Ghaem Hospital

Epidemiology, Risk Determinants, And Clinical Outcomes Of Singleton Preterm Births At Lagos Island Maternity, Lagos, Nigeria.

Oluwole John Oluwafemi[1], Muisi Alli Adenekan[1*], Adelana Olusegun Odumabo[1], Okeke Anthony Nnaemeka[1], Nwogu Magnus Chidinma[2], Adefemi Ayodeji Kayode[3], Ugwu Aloy Okechukwu[4], Awoniyi Adebayo Williams[5], Omisakin Sunday Isaac[5]

[1]*Department of Obstetrics and gynaecology, Lagos Island Maternity Hospital, Lagos*
[2]*Department of Obstetrics and gynaecology. Kingswill Specialist Hospital, FESTAC Town, Lagos*
[3]*Department of Obstetrics and gynaecology, Lagos STATE University Teaching Hospital, Ikeja*
[4]*Department of Obstetrics and gynaecology, 68 Nigerian Army Reference Hospital, Lagos, Nigeria*
[5]*Department of Obstetrics and gynaecology, Lagos University Teaching Hospital, Idi-Araba, Lagos.*

ARTICLE INFO

Article type
Original Research Article

Article history
Received: 11 Jun 2025
Revised: 09 Jul 2025
Accepted: 19 Jul 2025

Keywords
Preterm birth
Prevalence
Prematurity
singleton pregnancy
Perinatal Death

ABSTRACT

Introduction: Preterm birth is a major public health problem and a significant contributor to neonatal morbidity and mortality globally and especially in resource-poor settings such as Nigeria. While preterm birth rates are known to be high in Sub-Saharan Africa, current data are insufficient to comprehensively explain the contributing factors in this region. This study aims to explore the prevalence, risk determinants, and clinical outcomes of singleton preterm births in Lagos Island Maternity Hospital, Lagos, Nigeria.

Methods: This is a retrospective study done over a triennium, between January 2021 and December 2023.

Results: Out of 9180 singleton birth, there were 1828 (19.9%) preterm deliveries. Due to incomplete records, 21 patients were deliberately omitted from the analysis. 1760 (97.4%) were live births while 47 (2.6%) were stillbirths. In addition, of the live births, the majority, 1043 (59.3%), were Moderate-to-late Preterm, followed by 537 (30.5%) who were Very Preterm and 180 (10.2%) were Extremely Preterm. 963 (54.7%) were admitted to the Neonatal Ward, 649 (36.4%) were asphyxiated in the fifth minute of life. Neonatal death occurred in 224 cases (12.7%). Preterm deliveries were higher among multiparous women, women without antenatal booking, and those with hypertensive pregnancy disorders.

Conclusion: The prevalence of preterm deliveries among singleton pregnancies was 19.9% and remains a significant contributor to perinatal mortality. Identified risk factors for preterm birth included multiparity, absence of antenatal care, and hypertensive disorders of pregnancy

Please cite this paper as:
Oluwafemi OJ[1], Adenekan MA[1], Odumabo AO[1], Nnaemeka OA[1], Chidinma NM[2], Kayode AA[3], Okechukwu UA[4], Williams AA[5], Isaac OS[5]. Epidemiology, Risk Determinants, And Clinical Outcomes Of Singleton Preterm Births At Lagos Island Maternity, Lagos, Nigeria. Rev Clin Med. 2025;12(3): 73-79.

Introduction

Preterm birth refers to the delivery of a baby before completing 37 weeks of gestation, or less than 259 days from the first day of the woman's last menstrual period.[1] This period is commonly categorized into subgroups, though the classifications may differ across organizations. According to the World Health Organization (WHO), births occurring before 28 completed weeks are classified as extremely preterm, those between 28 weeks and 31 weeks and 6 days as very preterm, and births from 32 weeks to 36 weeks and 6 days as moderate to late preterm [1]. Preterm birth is a substantial global health issue with significant consequences to the newborn, family, and society [2]. Worldwide, prematurity, occurring mostly as a result of Preterm birth, is the leading cause of death in children under the age of 5 years [1]. Globally, about 15 million babies are born preterm each year and most preterm births occur in Sub-Saharan Africa and Southern Asia [1,3]. The incidence of preterm birth varies significantly across the world. In most

***Corresponding author:** **Muisi Alli Adenekan,** Consultant Obstetrician and Gynaecologist
Email. alokechugwu@gmail.com, Tel: +2349094666053

Doi: 10.22038/rcm.2025.88840.1551

developed nations of the world, the rate of preterm birth is below 10%; the United Kingdom has a Preterm birth rate that is around 7%, and in the United States of America, Preterm birth rate ranges between 9 and 12% with huge interstate variation. The rate is much higher in most underdeveloped and developing countries, and Nigeria is among the countries with the greatest number of Preterm births, with Preterm birth rates exceeding 15% [3].

Preterm births can happen for various reasons, with the majority being spontaneous. They may also result from preterm Prelabour rupture of membranes or be medically induced due to a range of maternal and/or fetal conditions [1,4,5]. Although most preterm births occur without warning, certain cases result from medical complications like infections and pregnancy-related hypertensive disorders such as preeclampsia and eclampsia, maternal anaemia, malnutrition in pregnant mothers, maternal infections in pregnancy and other pregnancy complications that require early delivery, either by induction of labour or caesarean birth [6-8].

In comparison with infants born at term, preterm infants have a much greater risk of morbidity and mortality. [1-5] These infants are also more likely to have difficulty with feeding, poor blood glucose control, neonatal jaundice, temperature instability, apnea, respiratory distress, sepsis, wide spectrum of neuro-developmental disabilities, as well as growth and health problems either singly or in combination compared to neonates delivered at term [5]. Despite the various known risk factors, some preterm births have no identifiable risk factors [9], with a study reporting a lack of identifiable risk factors in 36.4% of Preterm births [10].

Although the rate of Preterm births is unacceptably high in Nigeria, the plethora of available data have not exhaustively identified all the factors associated with Preterm births in our environment. Against this background, the present study was undertaken to determine the prevalence of preterm births at Lagos Island Maternity Hospital, identify associated risk factors, and assess fetal outcomes linked to preterm deliveries at the center. The findings are intended to supplement existing data on preterm births at both local and national levels, and to inform the development of targeted intervention strategies aimed at reducing the incidence and impact of preterm births while improving perinatal outcomes.

Methods

Study Site

This study was carried out in the labour and neonatal wards of Lagos Island Maternity Hospital. Both wards operate 24 hours a day, and the hospital records over 3,000 deliveries annually. Ethical approval for the study was obtained from the hospital's Research and Ethics Committee.

Study Design and Participants

This is a retrospective cohort study carried out from January 1, 2021, to December 31, 2023. The study population was all women who had preterm delivery at the Lagos Island Maternity Hospital Lagos, Nigeria.

Criteria for Inclusion in The Study

The inclusion criteria comprised singleton births occurring between 28 and 36 weeks and 6 days of gestation, as well as live births before 28 weeks. Exclusion criteria included multiple preterm births, pregnancies with unknown gestational age, and cases with incomplete data—particularly where gestational age was not documented.

Data Collection And Analysis

Data for this study were collected using a structured proforma and retrieved from multiple sources, including the Health Information Management Department, Labour Ward Records, Neonatal Ward Registers, and participants' Electronic Medical Records. The following independent (maternal and obstetric) variables were extracted:

Maternal age, categorized as ≤20 years, 21–34 years, and ≥35 years.

Parity, categorized as primiparous (Para 1), multiparous (Para 2–4), and grand multiparous (Para ≥5).

Antenatal booking status classified as booked or unbooked.

Gestational age at delivery, based on WHO classification:

Extremely preterm (<28 weeks)

Very preterm (28 weeks to 31 weeks + 6 days)

Moderate-to-late preterm (32 weeks to 36 weeks + 6 days)

Mode of delivery, categorized as vaginal delivery or caesarean section.

Pregnancy complications, including hypertensive disorders of pregnancy, antepartum haemorrhage, preterm Prelabour rupture of membranes (PPROM), intrauterine fetal demise (IUFD), and intrauterine growth restriction (IUGR).

Fetal variables included: Birth outcome, classified as live birth or stillbirth. Sex of the neonate, male or female. Birth weight, categorized as: Extremely low birth weight (ELBW): 0–999g, Very low birth weight (VLBW): 1000–1499g, Low birth weight (LBW): 1500–2499g, Normal birth weight: ≥2500g,

Apgar score at 5 minutes, categorized as <7 (asphyxiated) or ≥7 (normal). Neonatal ward admission, recorded as yes or no. Neonatal ward outcome, categorized as discharged, discharged against medical advice (DAMA), or died

Results

During the study period, a total of 9,180 singleton births were recorded, of which 1,828 were preterm,

resulting in a prevalence of 19.9%. Of these preterm births, 21 cases were excluded from the analysis due to incomplete data. Among our cohort 1760 were live births (97.4%) while 47 (2.6%) were stillbirths. Of the live births, majority, 1043 (59.3%), were Moderate-to-late Preterm, followed by 537 (30.5%) who were Very Preterm and 180 (10.2%) were Extremely preterm.

Demographic and Obstetric characteristics of the study population- most of our participants had more than secondary education (88.7%), 68.8% did not receive antenatal care in our facility while more than half of the women had vaginal delivery.

Table 1 shows the demographic characteristics of the women in the study. Majority of the women, 913 (50.5%) were at least 35 years old, followed by 790 (43.7%) women between ages 20 and 34 years. Women who were younger than 20 years were in the minority, 104 (5.8%). The study comprised 1088 (60.2%) multiparous women, 530 (29.3%) grandmultiparous women and 189 (10.5%) primiparous women.

564 (31.2%) were Booked, while 1243 (68.8%) were Unbooked.

Married women made in the majority, 1466 (81.1%) while unmarried women were 341 (18.9%).

Vaginal delivery accounted for 1065 (58.9%) births while 742 (41.1%) births occurred through Caesarean section.(Table 1)

Table 1. Demographic And Obstetric Characteristics Of The Study Population

Variables	Frequency (n = 1807)	Percentage (%)
Maternal age (years)		
<20	104	5.8
20-34	790	43.7
≥ 35	913	50.5
Parity		
1	189	10.5
2 – 4	1088	60.2
≥ 5	530	29.3
Level of education		
Primary	204	11.3
Secondary	1346	74.5
Tertiary	257	14.2
Booking status		
Booked	564	31.2
Unbooked	1243	68.8
Marital status		
Married	1466	81.1
Unmarried	341	18.9
Mode of delivery		
Vaginal	1065	58.9
Caesarean section	742	41.1
Delivery outcome		
Live births	1760	97.4
Stillbirths	47	2.6

Table 2 shows the neonatal characteristics/ outcome among the live births. There were 917 (52.1%) females, and 843 (47.9%) males.

Neonates with Low Birth Weight were in the majority, 851 (48.4%), followed by those with Very Low Birth Weight, 629 (35.7%). 195 (11.1%) of the Neonates had Extremely Low Birth Weight while 85 (4.8%) had normal birth weight.

649 (36.9%) of the neonates were asphyxiated in the fifth minute of life, with an Apgar score less than 7, while 1111 (63.1%) of the neonates were not asphyxiated and had an Apgar score of at least 7.

More than half of the live births were admitted in the Neonatal Ward, 963 (54.7%), while the rest, 797 (45.3%) were nursed by their mothers.

936 (53.2%) of the neonates did not require incubator care, while 824 (46.8%) required incubator care.

Neonates discharged alive and well were 1522 (86.5%), while 224 (12.7%) died on admission and 14 (0.8%) of the neonates were discharged against medical advice. (Table2)

Table 2. Neonatal Characteristics / Outcome Among the Live Births In Study Population

Variables (n = 1760)	GA at delivery (preterm birth)			Total, n (%)
	<28 weeks, n (%)	28-31^{+6} weeks, n (%)	32-36^{+6} weeks, n (%)	
Sex of neonate				
Male	83 (46.1)	155 (28.9)	605 (58.0)	843 (47.9)
Female	97 (53.9)	382 (71.1)	438 (42.0)	917 (52.1)
Birth weight (g)				
ELBW (<0-999)	180 (100)	15 (2.8)	0	195 (11.1)
VLBW (1000-1499)	0	470 (87.5)	159 (15.2)	629 (35.7)
LBW (1500-2499)	0	52 (9.7)	799 (76.6)	851 (48.4)
Normal (≥2500)	0	0	85 (8.2)	85 (4.8)
Apgar score				
Asphyxiated (Apgar <7)	180 (100)	286 (53.3)	183 (17.5)	649 (46.9)
Not asphyxiated (Apgar ≥7)	0	251 (46.7)	860 (82.5)	1111 (63.1)
Neonatal Ward admission				
Yes	180 (100)	495 (92.2)	288 (27.6)	963 (54.7)
No	0	42 (7.8)	755 (72.4)	797 (45.3)
Incubator care				
Yes	180 (100)	485 (90.3)	159 (15.2)	824 (46.8)
No	0	52 (9.7)	884 (84.8)	936 (53.2)
Neonatal outcome				
Discharged alive and well	12 (6.7)	486 (90.5)	1024 (98.1)	1522 (86.5)
Discharged against medical advice	0	2 (0.4)	12 (1.2)	14 (0.8)
Died	168 (93.3)	49 (9.1)	7 (0.7)	224 (12.7)

Figures 1 2, and 3 shows the prevalence of singleton preterm births, types of preterm births and indications for iatrogenic preterm birth respectively.

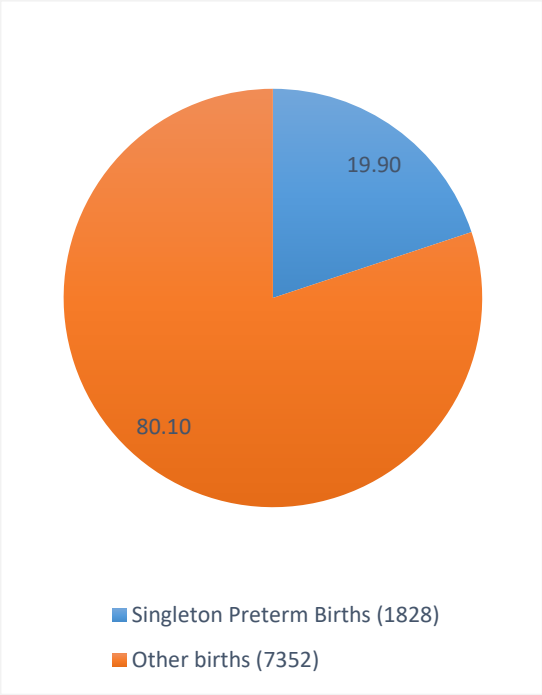

Figure1. The Prevalence of Singleton Preterm Births.

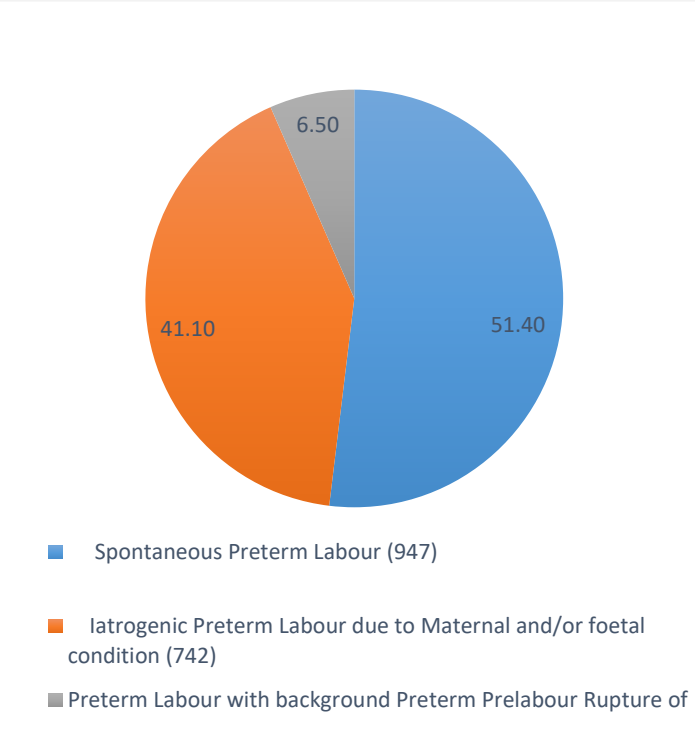

Figure 2. Types of Preterm Births.

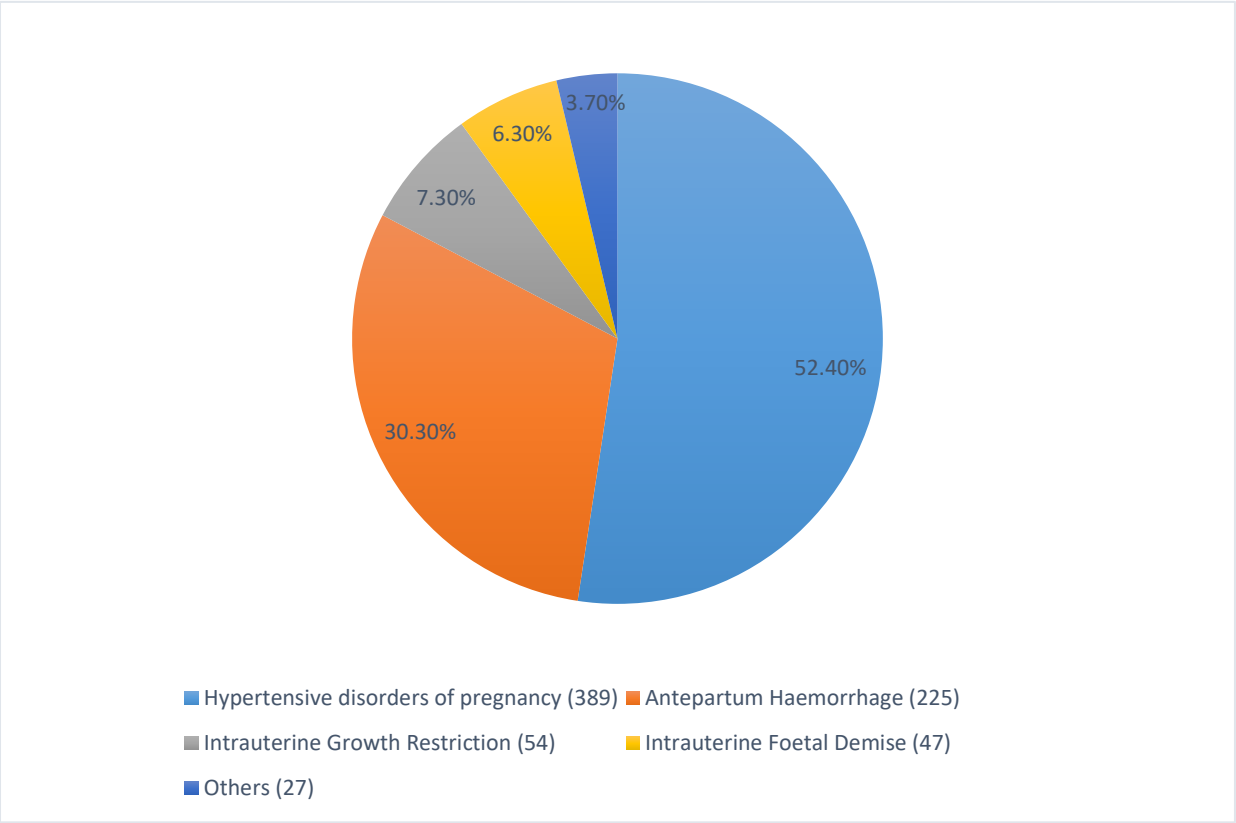

Figure 3. Indications For Iatrogenic Preterm Birth.

Figure1 Shows the Prevalence of Singleton Preterm Births.
Figure 2 shows the types of Preterm births. Majority of Preterm births occurred following Spontaneous Preterm Labour, 947 (52.4%), while 742 (41.1%) Preterm births were Iatrogenic on account of maternal and/or foetal indications. 118 (6.5%) Preterm births had background Preterm Prelabour Rupture of Membranes.
Figure 3 shows the indication for Iatrogenic Preterm Births, with Hypertensive disorders of Pregnancy such as Preeclampsia with severe features and Eclampsia accounting for 389 (52.4%) of Iatrogenic Preterm births. This was followed by Antepartum haemorrhage, accounting for 225 (30.3%) of Iatrogenic Preterm births. Intrauterine Growth Restriction and Intrauterine foetal demise accounted for 54 (7.3%) and 47 (6.3%) respectively of Iatrogenic Preterm births. Other indications for Preterm Delivery such as Uncontrolled Gestational Diabetes, Cord Prolapse accounted for 27 (3.7%) of this category of Preterm births.

Discussion

Globally, preterm deliveries account for approximately 5% to 18% of all deliveries, with the majority occurring in developing countries.[11] In this study, the prevalence of preterm birth among singleton deliveries at Lagos Island Maternity Hospital was 19.9%, which is notably higher than the 7.4% and 9.4% reported in tertiary hospitals in Rivers and Osun States, respectively. [11, 12]. Other similar studies in Nigeria reported a Preterm birth prevalence rate of 16%, 16.6% and 16.8% [6, 13, 14]. A low prevalence of Preterm birth of 1.5% was reported in a multi-centre study conducted in Nasarawa State, Northcentral Nigeria [15]. A study conducted in Ghana reported a prevalence rate of 18.9% of preterm births [16]. The high prevalence rate noted in this study is largely because Lagos Island Maternity Hospital is a major referral centre for Primary Health Centres and General Hospitals in Lagos, as well as other Private Hospitals within and around the State.
Spontaneous Preterm Labour accounted for majority of Preterm births in the study, similar to a study done in Public Hospitals in Addis Ababa, Ethiopia [17]. Iatrogenic Preterm births on account of maternal and/or fetal indications was the second leading type of Preterm birth. Associated factors with preterm births, as identified in the study include lack of antenatal care and hypertensivedisorders of pregnancy, a finding also reported by other studies [13,18]. The finding that singleton preterm birth was associated with lack of antenatal care was consistent with previous studies in Nigeria [11,19].
Hypertensive disorders of pregnancy, especially

preeclampsia with severe features is a known major cause of Preterm births, as timely intervention minimizes the risk of maternal and/or fetal morbidity and mortality. It accounted for majority of the iatrogenic type of Preterm birth. This finding corroborated similar findings in other studies [7,12].

Higher rate of Preterm birth was observed among multiparous women, and women who did not receive antenatal care and those who were 35 years of age or older. This pattern was also reported in a study done in Port-Harcourt, Rivers State, Nigeria [11]. Women of advanced age are at higher risk of having comorbidities such as Hypertensive Disorders of Pregnancy especially Chronic Hypertension and Pre-eclampsia, Gestational Diabetes Mellitus, and so on. This, amongst other reasons, may be contributory to the high prevalence of Preterm births among women who are 35 years old and older.

Majority of the Preterm Babies (86.5%) in the study were discharged home alive, with or without being admitted into the Neonatal Ward. This finding was higher than the 72.31% survival rate among Preterm Babies reported in a Tertiary Centre in Maiduguri, Northeast Nigeria [20]. This was however lower than the 92.8% survival rate among Preterm Babies reported in a Specialist Centre in Akure, Southwest Nigeria [21].

This study utilized the WHO classification system to categorize preterm births [1], as done by Awoyesuku et al in a similar study at a teaching hospital in Rivers state, South-south Nigeria [11]. The prevalence rate in the categories of Preterm births however vary in both studies. In this study, Extreme Preterm, Very Preterm, and Moderate-to-late Preterm births occurred in 11.1%, 35.7%, and 48.4% respectively of the total Preterm births. This contrasts with the prevalence rate of 0.4%, 33.3% and 66.3% reported in each respective category in the Port-Harcourt Study [11]. Comparing the birth weights of Preterm Babies in both studies revealed similar patterns.

Both studies revealed that most Preterm Babies had Low birth weight, and Extremely low birth weight account for the least. These findings agree with the findings of Oluwafemi et al in Akure, Southwest Nigeria [21].

In this study, Low birth weight babies accounted for 48.4% of Preterm Babies, compared to 56.7% and 90.2% in the Port-Harcourt and Akure Studies respectively. Also, 11.1% of babies had Extremely low birth weight, compared to 6.3% and 2.1% in the two studies mentioned.Of note is that percentage Preterm Babies with Normal birth weight was 4.8%, which was lower than the 15.9% reported in the Port-Harcourt Study [11].

This study also demonstrated that all indicators of poor perinatal outcomes including low birth weight, birth asphyxia, neonatal ward admission, and neonatal mortality were significantly more severe in extremely preterm neonates compared to other preterm categories.[6, 8, 11] As expected, very low birth weight neonates also experienced worse outcomes than those born moderate to late preterm

Limitations

Since this study was conducted at a single center, its findings are specific to that location and may not be generalizable to other settings. Larger, multi-center studies are necessary to accurately assess the prevalence and neonatal outcomes of preterm births across Nigeria, as well as to identify the underlying factors contributing to preterm delivery.

Conclusion

The prevalence of preterm birth among singleton pregnancies in this study was 19.9%, and it continues to be a major contributor to perinatal mortality. Hypertensive disorders of pregnancy and absence of antenatal care were identified as key risk factors. Indicators of poor perinatal outcomes including low birth weight, birth asphyxia, stillbirth, and neonatal ward admissions, were significantly more severe in extremely preterm infants compared to other preterm and term birth categories.

Recommendations

We recommend Continuous community enlightenment on utilization of antenatal care, increased capacity, in terms of personnel and technology, to improve the quality of neonatal care and a large-scale multi center research on Preterm births, associated factors and outcome.

Acknowledgements

Our sincere appreciation goes to our nurses and administrative staff who played an immeasurable in the management of these patients.

References

1. World Health Organisation. Preterm birth. Available from: https://www.who.int/news-room/fact-sheets/detail/preterm-birth [Accessed 16th May 2025].

2. Cunningham FG, Leveno KJ, Dashe SE. Preterm Birth. Williams Obstetrics. 26th ed. McGraw Hill 2022; 48: 2036-2118.

3. Bennett P. Preterm Labour. In: Edmonds K, Lees C, Bourne T. Dewhurst's Textbook of Obstetrics & Gynaecology. 9th ed. West Sussex: Wiley Blackwell; 2018. 387-412. https://doi.org/10.1002/9781119211457.ch28 PMCid:PMC6034665

4. Umeigbo BC, Modebe IA, Iloghalu IC, Eleje GU, Okoro CC, Umeononihu OS et al. Outcomes of Preterm Labor and Preterm Births: A Retrospective Cross-Sectional Analytical Study in a Nigerian Single Center Population. Obstet Gynecol Res. 2020 https://doi.org/10.26502/ogr031 3(1): 17-28. Available from: doi: 10.26502/ogr031 [Accessed 16th August 2024]. https://doi.org/10.26502/ogr031

5. Sendeku FW, Beyene FY, Tesfu AA, Bante SA, Azeze GG. Preterm birth and its associated factors in Ethiopia: a systematic review and

meta-analysis. Afr Health Sci. 2021
21(3): 1321-1333. Available from: doi: 10.4314/ahs.v21i3.43 [Accessed 16th August 2024]. https://doi.org/10.4314/ahs.v21i3.43
PMid:35222597 PMCid:PMC8843273
6. Oluwole AA, Ugwu AO, Soibi-Harry AP, Garba SR, Okunade KS, Makwe CC. et al. Maternal Outcomes of Eclampsia at the Lagos University Teaching Hospital: A Six-Year Retrospective Review. West Afr J Med. 2022 Jan 31;39(1):20-23. PMID: 35156783. https://doi.org/10.55891/wajm.v39i1.88
PMid:35156783
7. Omisakin SI, Ogoh GS, Ayeni SA, Ugwu AO, Ugwu AO, ODO C. Haematological Profile and Prevalence of Bloodborne Viruses Among Pregnant Women Attending Antenatal Clinic in a Tertiary Military Hospital in Lagos, Southwest of Nigeria. 2025 Jan 1;1. http://dx.doi.org/10.62160/mi.2025.06.
https://doi.org/10.62160/MI.2025.06
8. Ugwu AO, Makwe CC, Oluwole AA, Okunade KS, Odo CC, Ezeoke CD. Seroprevalence of Hepatitis B, and C Viruses and HIV Infections among Antenatal Women in a Secondary Health Facility in Lagos, Nigeria. West Afr J Med. 2022 Oct 20;39(10):1084-1088. PMID: 36260916.
9. Muhumed II, Kebira JY, Mabalhin MO. Preterm Birth and Associated Factors Among Mothers Who Gave Birth in Fafen Zone Public Hospitals, Somali Regional State, Eastern Ethiopia.Research and Reports in Neonatology. 2021 https://doi.org/10.2147/RRN.S295820
11: 23-33. Available from: doi: https://doi.org/10.2147/RRN.S295820 [Accessed 16th August 2024]
https://doi.org/10.2147/RRN.S295820
10. Akintayo AA, Awoleke JO, Ogundare EO, Olatunya OS,Aduloju OP. Preterm births in a resource constrained setting: sociobiologic risk factors and perinatal outcomes. Ghana Med. J. 2015 https://doi.org/10.4314/gmj.v49i4.6
49(4): 251-257. Available from: doi: http://dx.doi.org/10.4314/gmj.v49i4.6 [Accessed 16th August 2024].
https://doi.org/10.4314/gmj.v49i4.6
11. Awoyesuku PA, John DH, Josiah AE, Sapira-Ordu L, Ohaka C, Amadi SC. Prevalence, associated factors, and outcomes of singleton preterm births at a tertiary hospital in Port-harcourt, Nigeria. Niger J Med. 2023
https://doi.org/10.4103/NJM.NJM_1_23
32: 80-87. Available from: doi: 10.4103/NJM.NJM_1_23 [Accessed 16th August 2024].
https://doi.org/10.4103/NJM.NJM_1_23
12. Fasanu AO, Atanda OA, Taiwo AO, Afolabi A. Prevalence and risk factors for preterm delivery in UNIOSUN Teaching Hospital, Osogbo - A 5 year retrospective review. Res. J. Health Sci. Vol. 2023 https://doi.org/10.4314/rejhs.v11i2.3
11(2): 99-109. Available from: doi: http://dx.doi.org/10.4314/rejhs.v11i2.3 [Accessed 16th August 2024].
https://doi.org/10.4314/rejhs.v11i2.3
13. Butali A, Ezeaka C, Ekhaguere O, Weathers N, Ladd J, Fajolu I, et al. Characteristics and risk factors of preterm births in a tertiary centre in Lagos, Nigeria. Pan Afr Med J. 2016; 24:1. Available from: doi: 10.11604/pamj.2016.24.1.8382 [Accessed 16th August 2024]. https://doi.org/10.11604/pamj.2016.24.1.8382
PMid:27583065 PMCid:PMC4992393
14. Nnagbo JE, Ugwu GO, Eze MI, Agu PU, Nnagbo CL, Udealor PC et al. Incidence, determinants, and outcomes of spontaneous preterm birth at tertiary hospitals in Enugu, Southeast, Nigeria: A cross-sectional study. Niger J Clin Pract. 2024; 27: 228-235. Available from: doi: 10.4103/njcp.njcp_634_23 [Accessed 16th August 2024]. https://doi.org/10.4103/njcp.njcp_634_23
PMid:38409152
15. Hassan I, Bello S, Anazodo M, Lawal MA. Burden and risk factors of preterm birth in Nasarawa State, North Central, Nigeria: A five-year case review. J. Med. Res. 2021
7(2): 36-41. Available from: doi: 10.31254/jmr.2021.7203 [Accessed 16th August 2024].
https://doi.org/10.31254/jmr.2021.7203
16. Adu-Bonsaffoh K, Gyamfi-Bannerman C, Oppong SA, Seffah JD. Determinants and outcomes of preterm births at a tertiary hospital in Ghana. Placenta. 2019; 79: 62-67. Available from: doi: 10.1016/j.placenta.2019.01.007 [Accessed 16th August 2024]. https://doi.org/10.1016/j.placenta.2019.01.007
PMid:30654915
17. Deressa, A.T., Cherie, A., Belihu, T.M. et al. Factors associated with spontaneous preterm birth in Addis Ababa public hospitals, Ethiopia: cross sectional study. BMC Pregnancy Childbirth. 2018; 18: 332. Available from: doi: Shttps://doi.org/10.1186/s12884-018-1957-0 [Accessed 16th August 2024].
https://doi.org/10.1186/s12884-018-1957-0
PMid:30103704 PMCid:PMC6090733
18. Mustapha B, Simon P, Abdullahi BI, Abubakar HI. Prevalence and associated morbidities of preterm neonatal admissions at the University of Maiduguri Teaching Hospital, North-Eastern Nigeria.Niger J Paediatr. 2020 https://doi.org/10.4314/njp.v47i3.12
47(3): 264-269. Available from: doi: http://dx.doi.org/10.4314/njp.v47i3.12 [Accessed 16th August 2024].
https://doi.org/10.4314/njp.v47i3.12
19. Iyoke CA, Lawani LO, Ezugwu EC, Ilo KK, Ilechukwu GC, Asinobi IN. Maternal risk factors for singleton preterm births and survival at the University of Nigeria Teaching Hospital, Enugu, Nigeria. Niger J Clin Pract. 2015 https://doi.org/10.4103/1119-3077.158141
PMid:26289511
18(6): 744-750. Available from: doi: 10.4103/1119-3077.158141 [Accessed 16th August 2024].
https://doi.org/10.4103/1119-3077.158141
PMid:26289511
0. Bako B, Idrisa A, Garba MA, Pius S, Obetta HI. Determinants of neonatal survival following preterm delivery at the University of Maiduguri Teaching Hospital, Maiduguri, Nigeria. Trop J Obstet Gynaecol. 2017;34:39-44. Available from: doi: 10.4103/TJOG.TJOG_49_16 [Accessed 16th August 2024]. https://doi.org/10.4103/TJOG.TJOG_49_16
21. Oluwafemi RO, Abiodun MT. Incidence and outcome of preterm deliveries in Mother and Child Hospital Akure, Southwestern Nigeria.Sri Lanka J. Child Health. 2016; 45(1): 11-17. Available from: doi: http://dx.doi.org/10.4038/sljch.v45i1.8079 [Accessed 16th August]. https://doi.org/10.4038/sljch.v45i1.8079