

Profiling the Socio-Demographic Characteristics and Outcome of Preterm Delivery in Alex Ekwueme Federal University Teaching Hospital Abakaliki

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Abstract

Background: Preterm delivery is a major cause of perinatal morbidity and mortality globally. In more than half of the cases, the exact cause is unknown and it is largely unpredictable. Certain maternal, social and demographic characteristics are risk factors and often help to predict and prognosticate the neonatal outcomes. Objective: This study was designed to determine the maternal socio-demographic characteristics and neonatal outcomes of patients managed for singleton preterm delivery in Alex Ekwueme Federal University Teaching Hospital, Abakaliki. Method: This was a 4-year retrospective analysis of patients managed for preterm birth from 1st January 2012 through 31st December 2015. Results: Over the study period there were a total number of 623 singleton preterm deliveries in the facility, while there were 9647 deliveries in the facility; the preterm birth rate was 6.5% or 65 per 1000 deliveries. The mean maternal age was 28.79 \pm 5.33 while the mean parity was 1.89 \pm 1.98. The mean gestational age and birth weight were 33.67 \pm 2.62 and 2.30 \pm 0.78 kg respectively. Apgar score in 1 minute was 6.89 ± 3.27 , while in the 5th minute was 7.95 \pm 3.42. Majority of the patients were multiparous and booked for antenatal care in the facility. Most of the preterm labour started spontaneously and were delivered vaginally. The caesarean section rate in this study was 35.5%. Fetal distress and preeclampsia/eclampsia were the commonest indications for caesarean section. The male to female ratio was 1.1:1. Nearly half of the neonates were born with normal birth weight and 427 (68.5%) were alive at discharge. However, 196 (31.5%) suffered early neonatal death due to prematurity. Maternal parity, booking status and fetal weight

were significant determinants of fetal outcome with a p-value < 0.05. **Conclusion:** Birth weight was the most important determinant of neonatal survival and the unbooked patient was an important determinant of poor outcome. Booking for antenatal care and ensuring optimal weight at delivery would go a long way at reducing the poor neonatal outcome associated with preterm delivery.

Keywords

Preterm Delivery, Maternal Sociodemographic Characteristics, Neonate

1. Introduction

Preterm delivery is the birth that occurs after the age of viability, which is 28 weeks in Nigeria, but before 37 weeks gestation [1] [2] [3]. It is a major cause of neonatal morbidity and mortality globally accounting for 1.1 million neonatal deaths annually [1] [2] [3] [4]. Currently, prematurity is the leading cause of deaths among children under five around the world, and a leading cause of disability and ill health later in life [1] [5]. Of the 15 million preterm babies worldwide, sub-Saharan Africa and South Asia account for over 60%, more than one million die due to complications related directly or indirectly to preterm births [1]. Preterm births complicate approximately 12% of all pregnancies in the United States and cause 75% of neonatal deaths that are not due to congenital anomalies [2], while out of 645,000 live births in the United Kingdom, 7.4% were preterm [4]. In Nigeria, between 773,597 to 871,000 babies are born preterm each year with prevalence rate of 12.2% and 98,300 children under five die due to direct preterm complications [1] [6] [7]. Southeast Nigeria has average prevalence rate of 16.9% as was found in a recent study [8].

The cause of preterm birth in about half of the pregnancies is unknown [8]. However, many obstetric, medical and anatomic disorders are associated with preterm labour and delivery. Some of the risk factors include, previous preterm birth, severe hypertensive disorders, anatomic disorders of placenta (abruption placenta, placenta praevia, circumvallate placenta), placenta insufficiency, premature rupture of membrane, polyhydramnios or oligohydramnios, multiple gestation, cervical weakness, abnormal uterine activities, and distortion, cervical inflammation like bacteria vaginosis or trichomonas, maternal infections such as urinary tract infection, malaria etc.; severe anaemia, alcoholism and drug addiction, malnutrition or obesity, cigarette smoking, recurrent antepartum haemorrhage, any invasive procedure or surgery, poor socioeconomic status, black ethnicity [2]-[24]. While most of the associated risk factors are non-modifiable; smoking, drug and alcohol abuse, underweight (Body mass Index $< 20 \text{ kg} \cdot \text{m}^{-2}$), short pregnancy interval of less than one year are modifiable factors [4]-[23]. Thus, efforts should be geared towards preventing and reducing the incidence through the control of modifiable factors.

The primary complication of preterm birth stems from the problems of prematurity of the infant and its chain of events. Lower birth weight babies have a lesser chance of survival and a greater chance of permanent sequelae [5]-[11]. Late preterm infants typically have better health outcomes than those born earlier, but they are still three times more likely to die in the first year of life than are full term infants [9]. Excellent neonatal care in the delivery room and newborn intensive care unit will enhance good prognosis for the preterm neonate.

In August 2015, the World Health Organization (WHO) published new recommendations to improve the survival and health of babies born too soon. Decision-makers should review and revise national clinical guidelines and essential medicine lists; promote the new recommendations widely; strengthen the skills of health workers to accurately assess gestational age; and monitor adherence to the guidelines [7].

There has been no study in our centre that detailed the socio-demographic characteristics and outcome of preterm delivery. As preterm birth is associated with health, socioeconomic and psychological consequences [8]-[13], it became necessary to profile the outcome of preterm delivery in our centre. The data obtained enhance greater understanding for prevention, proper management of preterm delivery and for scholarly insight. Therefore, the aim of this study was to determine the incidence and socio-demographic characteristics of patients with preterm birth.

2. Materials and Method

Study area: Alex Ekwueme Federal University Teaching Hospital is a tertiary hospital within Abakaliki metropolis. It was formerly known as Federal Teaching Hospital Abakaliki. The hospital is made up of ten clinical departments; Obstetrics and Gynaecology, Paediatrics, Medicine, Surgery, Psychiatry, Community Health, Family Medicine, Ophthalmology, Otorlanrygology and Anaesthesiology. The Obstetrics and Gynaecology Department is one of the ten clinical departments in the hospital, it has ten teams with each comprising consultants, senior registrars, registrars, senior house officers and house officers. The department runs gynaecology clinics, preconception, antenatal, intrapartum and postnatal services. It is also a referral centre to the surrounding maternities and hospitals. It receives referral from the surrounding states of Cross River, Enugu and Benue. The labour ward offers 24 hours services and has average of 228 deliveries per month.

Study design: This was a retrospective study of the preterm deliveries managed at the Obstetrics and Gynaecology, and the Paediatrics Department of FETHA from 1st January 2012 through 31st December 2015. The records and case files of these parturients were retrieved from the Medical Records department, paediatrics department, Obstetric units including emergency unit, Labour wards, Operation Theatre, and data extracted into a study proforma and compared, focusing on socio-demographic and obstetric characteristics including age, parity,

occupational status, booking status, gestational age, risk factors for preterm delivery, mode of delivery, Apgar scores, birth weight, and the perinatal outcome.

Data analysis: This was done using a pre-designed proforma. Data analysis was done using latest Epi Info software (7.2.1 CDC Atlanta Georgia). The results were expressed as frequency tables, percentages, mean and standard deviation and comparable odd ratio.

Ethical consideration: Permission to carry out this research work was sought and obtained from the Research and Ethical Committee of the Alex Ekwueme Federal University Teaching Hospital Abakaliki.

3. Results

Over the study period there were a total number of 623 singleton preterm deliveries in the facility, while there were 9647 deliveries in the facility, the preterm birth rate was 6.5% or 65 per 1000 deliveries. The mean maternal age was 28.79, while the mean birth weight was 2.30 ± 0.78 kg and the mean parity was 1.89 ± 1.8 .

Table 1 shows the maternal socio-demographic characteristics of the patients. Majority of the patients 78.8% were within the reproductive age group. More than 50% were multiparous and booked for antenatal care in the facility.

The obstetrics and perinatal outcomes are shown in **Table 2**. Most (71.7%) of the preterm labour started spontaneously and majority of the parturients (64.5%) were delivered vaginally. The caesarean section rate in this study was 35.5%. Fetal distress (28.5%) and preeclampsia/eclampsia (17.6%) are the commonest indications for caesarean section while mild abruptio placentae (5.9%) was the least indication for caesarean section. Majority of the fetus were male with a male to female ratio of 1.1:1. Nearly half of the neonates were born with normal birth weight and were alive at discharge.

Table 3 shows a cross tabulation of some maternal socio-demographic characteristics and obstetric outcome with the fetal outcome. Maternal age, mode of delivery and fetal sex were not statistically different among neonates that were alive at hospital discharge and those that suffered early neonatal death, while maternal parity, booking status and fetal weight were significant determinants of fetal outcome with a p value < 0.05.

4. Discussion

The preterm delivery rate in this study was 6.5%, this value is similar to the value obtained from Chigbu in Aba [14] Nigeria and Ayman in Cairo Egypt [22]. It is however lower than 12.0% - 16.9% reported in similar studies [13] [16] [23] [24]. The difference in the prevalence might be as a result of the difference in the population characteristics and the study design, while the study by Mokuola and coworkers was a prospective study of nine months duration which excluded multiple gestation [16]. Iyoke and coworkers included multiple gestation that were complicated by preterm birth. The majority of the women in this study

Parameters	Frequency	Percentage
Age		
<20	26	4.2
20 - 34	491	78.8
≥35	106	17.0
Parity		
0	197	31.6
1 - 4	359	57.6
≥5	67	10.8
Booking status		
Booked	404	64.8
Unbooked	219	35.2
Residential area		
Rural	431	69.2
Urban	192	30.8
Highest educational qualification		
None/primary	128	20.5
Secondary	244	39.2
Tertiary	251	40.3

Tab	le	1	Maternal	socio-demographic characteristics	\$
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were in the peak of their reproductive age with a mean maternal age of 28.78 ± 5.33 years; this is similar to the finding in similar studies however, maternal age had not been found as a significant determinant of preterm delivery [8] [13] [14] Majority of the women were multiparous as against nulliparous or grand multiparous seen in other studies [8] [14]. The relationship between preterm delivery and parity have been inconsistent, while some studies had shown that nulliparity is a risk factor others have found no association [8] [16].

More than two third of the study population were booked for antenatal care in the facility, and were resident in urban area with majority of them having tertiary level of education, this may be a reflection of the environment were the hospital is sited. Abakaliki is the state capital and is an urban area. Conversely, Mokuolu and coworkers in Ilorin had previously demonstrated that being booked elsewhere and low social class significantly increase a woman's risk for preterm delivery [16].

Preterm labour may be spontaneous or induced for maternal or fetal indication(s). Majority of the women in this study had spontaneous preterm labour and delivery. This finding is similar to the finding by Iyoke *et al.* and the study by Chigbu *et al.* in Aba [13] [14]. Hypertensive disorders in pregnancy were the commonest indication for iatrogenic preterm delivery. This is the commonest medical disorder in pregnancy in our environment and it is also the commonest

Parameter	Frequency	Percentage
Onset of labour		
Spontaneous	447	71.7
Iatrogenic	176	28.3
Mode of delivery		
Abdominal	221	35.5
Vaginal	402	64.5
Indication for abdominal delivery		
Preeclampsia/eclampsia		
Placenta praevia	39	17.6
Mild abruptio placenta	24	10.9
≥2 previous scar	13	5.9
Fail induction of labour	25	11.3
Fetal distress	34	15.4
CPD	23	10.4
Fetal sex		
Female	299	48.0
Male	324	52.0
Birth weight (Kg)		
<1.0	19	3.0
1.0 - 1.49	75	12.0
1.5 - 2.49	230	36.9
≥2.5	299	48.1
Fetal outcome		
Alive at discharge	427	68.5
Died before discharge	196	31.5

 Table 2. Obstetrics and perinatal outcome.

indication for preterm delivery in other similar studies [14]. Kunle-Olowu *et al.* identified preterm premature rupture of fetal membranes as the highest risk factor followed by lack of antenatal care in 35.5% of the mothers [12], while antepartum haemorrhage and previous preterm births were the highest associated maternal risk factors in the Onankpa *et al.* study [11]. The caesarean section rate in this study was 35.3%, this is much higher than the caesarean section rate previously reported for the facility [25]. Similarly, high caesarean rate had been reported in similar study [13] as preterm babies are more at risk of birth asphyxia when compared with term babies necessitating expedited delivery. Preterm birth was commoner in pregnancies with male babies than with female babies; the reason for this difference was not readily available from this study but it might

Parameters	Total	Alive at discharge	Died before discharge	P value	
Age					
<20	26	10	16		
20 - 34	491	151	340	0.43688	
≥35	106	35	71		
Parity					
Nulliparous	197	70	127		
1 - 4	359	98	261	0.00551	
≥5	67	28	39		
Booking status					
Booked	404	96	308	.0.00001	
Unbooked	219	99	120	<0.0001	
Mode of delivery					
Abdominal					
Vaginal	221	74	147	0.38352	
v agiiiai	402	121	281		
Fetal sex					
Female	299	92	207	0 72297	
Male	324	104	220	0./238/	
Birth weight (Kg)					
<1.0	19	15	4		
1.0 - 1.49	75	38	37	0.00001	
1.5 - 2.49	230	90	140	<0.00001	
≥2.5	299	53	246		

Table 3. Determinants of fetal outcome.

not be unconnected to the fact that male babies are heavier at birth compared with female babies of similar gestational age.

The mortality rate in this study was 31.5%. This was much smaller than the 40% - 46.1% reported in similar studies done in Nigeria [13] [14]. The difference observed in this study may be as a result of the mean birth weight. While the mean birth weight of the preterm births in this study was 2.30 ± 0.78 kg the mean birth weight in the study by Chigbu and coworkers in Aba was 1700 g [14] while that by Iyoke was 2.0 ± 0.8 kg [13]. Maternal age and the sex of the neonate did not significantly affect the risk of neonatal death. However multiparity reduces the risk of neonatal death, as they are more likely to have heavier preterm babies. Despite the fact that more booked women had preterm birth in this study and in similar studies, the risk of neonatal death was statistically reduced in booked patients compared with the unbooked patient since they received antenatal care in the facility they were more likely to have iatrogenic preterm deli-

very which were better supervised [13] [14] [16]. The most important determinant of neonatal survival was the neonatal birth weight. Increasing neonatal weight reduces the risk of neonatal death. This trend had also been observed in similar studies in our environment [13] [14].

The limitation of this study is that the neonatal outcome for the rest of the puerperium could not be assessed because majority of the patients were lost to follow-up.

5. Conclusion

In conclusion, birth weight was the most important determinant of neonatal survival and the unbooked patient was an important determinant of poor outcome. Booking for antenatal care and ensuring optimal weight at delivery would go a long way at reducing the poor neonatal outcome associated with preterm delivery.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Blencowe, H., Cousens, S., Oestergaard, M.Z., Chou, D., Moller, A.B., *et al.* (2010) National, Regional and Worldwide Estimates of Preterm Birth Rate in the Year 2010 with Time Trends Since 1990 for Selected Countries: A Systematic Analysis and Implications. *The Lancet*, **379**, 2162-2172. https://doi.org/10.1016/S0140-6736(12)60820-4
- [2] Roman, A.S. (2013) Late Pregnancy Complications. In: Decherney, A.H., Nathan, L., Laufer, N. and Roman, A.S., Eds., *Current Diagnosis and Treatment, Obstetrics and Gynaecology*, 11th Edition, McGraw Hill Companies, New York, 250-266.
- [3] Bennett, P. (2012) Preterm Labour. In: Edmonds, D.K., Ed., Dewhurst's Text Book of Obstetric and Gynaecology, 8th Edition, Wiley-Blackwell Publications, London, 338-355. <u>https://doi.org/10.1002/9781119979449.ch28</u>
- [4] Griffith, J. (2011) Late Miscarriage and Early Birth. In: Baker, P.N. and Kenny, L.C., Eds., *Obstetrics by Ten Teacher*, 19th Edition, CRC Press, Boca Raton, FL, 132-143.
- [5] Centres for Disease Control and Prevention (2015) Preterm Birth. <u>http://www.CDC.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm(top)</u>
- [6] UN Inter-Agency Group for Child Mortality Estimation (2014) Levels and Trends in Child Mortality. UNICEF, WHO, World Bank, New York.
- [7] Evidence of Action (2015) Mamale Fact Sheet on Preterm Birth in Nigeria. Evidence for Action, London.
- [8] Iyoke, C.A., Lawani, L.O., Ezugwu, E.C., Ilo, K.K., Ilechukwu, G.C. and Asinobi, I.N. (2015) Maternal Risk Factors for Singleton Preterm Births and Survival at University of Nigeria Teaching Hospital, Enugu, Nigeria. *Nigerian Journal of Clinical Practice*, 18, 744-750. <u>https://doi.org/10.4103/1119-3077.158141</u>
- [9] March of Dimes 2011 (2015) Prematurity Research. http://wwwmarchofdimes.com/research/prematurity-research.aspx

- [10] World Health Organization (2014) Preterm Birth Fact Sheet No. 363. http://who.int
- [11] Onankpa, B.O. and Isezuo, K. (2014) Pattern of Preterm Delivery and Their Outcome in a Tertiary Hospital. *International Journal of Health Sciences and Research*, 4, 59-65.
- [12] Kunle-Olowu, O.E., Peterside, O. and Adeyemi, O.O. (2014) Prevalence and Outcome of Preterm Admissions at the Newborn Unit of a Tertiary Health Centre in Southern Nigeria. *Open Journal of Paediatrics*, 4, 67-75. https://doi.org/10.4236/ojped.2014.41009
- [13] Iyoke, C.A., lawani, O.L., Ezugwu, E.C., Ilechukwu, G., Nkwo, P.O., Mba, S.G. and Asinobi, I.N. (2014) Prevalence and Perinatal Mortality Associated with Preterm Births in a Tertiary Medical Centre in Southeast Nigeria. *International Journal of Women's Health*, 6, 881-888. <u>https://doi.org/10.2147/IJWH.S72229</u>
- [14] Chigbu, B., Onwere, S., Aluka, C., Kamanu, C., Femi-Waboso, P. and Okoro, O. (2014) The Burden of Preterm Births in Aba, Southeastern Nigeria. *Journal of Medical Investigation and Practice*, **9**, 55-58.
- [15] Lopez, P.O. and Breart, G. (2013) Sociodemographic Characteristics of Mother's Population and Risk of Preterm Birth in Chile. *Reproductive Health*, **10**, 26. https://doi.org/10.1186/1742-4755-10-26
- [16] Mokuolu, O.A., Suleiman, B., Adesiyun, O. and Adeniyi, A. (2010) Prevalence and determinants of preterm deliveries in the University of Ilorin Teaching Hospital, Ilorin, Nigeria. *Paediatric Reports*, 2, e3. <u>https://doi.org/10.4081/pr.2010.e3</u>
- [17] Ronget, F., et al. (2013) Medical and Sociodemographic Risk Factors for Preterm Birth in a French Caribbean Population of African Descent. Maternal and Child Health Journal, 17, 1103-1111. https://doi.org/10.1007/s10995-012-1112-x
- [18] Smith, L.K., Draper, E.S., Evans, T.A., et al. (2015) Associations between Late and Moderately Preterm Birth and Smoking, Alcohol, Drug Use and Diet: A Population Based Case-Cohort Study. Archives of Disease in Childhood-Fetal and Neonatal Edition, 100, F486-F491. http://fn.bmj.com
- [19] Onwuanaku, C.A., Okolo, S.N., Ige, K.O., Okpe, S.E. and Toma, B.O. (2011) The Effects of Birth Weight and Gender on Neonatal Mortality in North Central Nigeria. *BMC Research Notes*, 4, 562. <u>https://doi.org/10.1186/1756-0500-4-562</u>
- [20] Onalo, R. and Olateju, K.E. (2013) Trend and Seasonality in Admissions and Outcome of Low Birth Weight Infants in Gwagwalada, Abuja, Nigeria. *International Journal of Tropical Disease & Health*, 3, 190-198. <u>http://www.sciencedomain.org</u> https://doi.org/10.9734/IJTDH/2013/3416
- [21] Lee, H.C., Subeh, M. and Gould, J.B. (2010) Low Apgar Score and Mortality in Extremely Preterm Neonates Born in the United States. *Acta Paediatrics*, 99, 1785-1789. <u>https://doi.org/10.1111/j.1651-2227.2010.01935.x</u>
- [22] Ayman, S.A. and Alaa, A. (2015) Rate and Risk Factors of Preterm Births in a Secondary Health Care Facility in Cairo. *World Journal of Medical Sciences*, 12, 9-16.
- [23] Oluwafemi, R.O. and Abiodun, M.T. (2016) Incidence and Outcome of Preterm Deliveries in Mother and Child Hospital Akure, Southwestern Nigeria. *Sri Lanka Journal of Child Health*, 45, 11-17. <u>https://doi.org/10.4038/sljch.v45i1.8079</u>
- Butali, A., Ezeaka, C., Ekhaguere, O., Weathers, N., Ladd, J. and Fajolu, I. (2016) Characteristics and Risk Factors of Preterm Births in a Tertiary Center in Lagos, Nigeria. *Pan African Medical Journal*, 24, 1. https://doi.org/10.11604/pamj.2016.24.1.8382

[25] Ibekwe, P.C. and Dimejesi, I.B. (2008) Obstetric Indices at the Ebonyi State University Teaching Hospital, Abakaliki, South East Nigeria. *Nigerian Journal of Medicine*, 17, 399-402. <u>https://doi.org/10.4314/njm.v17i4.37420</u>