Original Research Article

Pattern of Preterm Delivery and Their Outcome in a Tertiary Hospital

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ABSTRACT

Background: The gestational age of a new born is an important denominator of neonatal survival, and preterm delivery remains an important perinatal health problem across the globe. **Aim:** To determine the pattern of preterm deliveries and their outcome in our Special Care Baby Unit (SCBU).
Methodology: The study was a 1-year cross-sectional, descriptive study. The case files of 195 preterm newborns admitted to SCBU of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto, Nigeria between 1st June, 2012 and 31st May, 2013 were reviewed.
Results: Neonatal admissions for the period were 822, preterms constituted 24.0% of that admission. Male preterms were 107(55%), while females were 88 (45%); with male to female ratio of 1.2:0.8. The mean birth weight was 1484 grams ± SD 361grams (males; 1438grams and females; 1541grams: p = 0.079). Forty percent were products of multiple gestations while 59.5% were singletons. All the preterms were of low birth weight (<2500 grams) but, were appropriate for their gestational age. Outcome was significantly related to birth weight and gestational age (p = 0.0001), ANC (p = 0.009) and place of delivery (p = 0.0001). Thirty percent (30.1%) died while, 69.9% were discharged home. Commonly associated maternal factors included ante partum hemorrhage and previous while, problems commonly observed amongst the preterms were neonatal sepsis and respiratory distress.
Conclusion: The prevalence of preterm deliveries is still high; we can improve on this by educating mothers on the need for adequate ANC attendance and encourage hospital deliveries.
Key words: Pattern, preterm delivery, outcome, tertiary Hospital.

INTRODUCTION

Data on birth outcomes still remain an important tool for planning maternal and child health care services but, this lacking in many developing countries. [1] While under-5 mortality rates are improving in many countries worldwide, neonatal mortality rates (deaths in the first 28 days of life) have shown much less progress. [1,2] Neonatal deaths now account for more than 42% of under five deaths. [1,2] Complications of preterm birth are the leading direct cause of neonatal mortality, accounting for an estimated 27% of the almost four million neonatal deaths every year, and act as a risk factor for many neonatal deaths due to other causes, particularly infections. [1,3] Pre-term babies account for 5–25% of all deliveries and up to 75% of all perinatal mortality in some series making pre-term deliveries still a significant perinatal challenge to pediatricians. [4,5] In Nigeria, pre-term babies

account for 40–60% of all perinatal deaths. [4,6] It is reported that only 0.87% of all live births occur at a gestational age less than 32 weeks and that births below this gestational age are responsible for 84% of the neonatal mortalities among infants of all gestational ages in developed countries. [7-9]

Though, country-level data are unavailable from some poor-resource countries, a recent publication gave an estimate that about 13 million preterm babies are born each year worldwide. [10] Globally, around one-third of babies are born at home with little or no information on birth weight, gestational age or even survival. Gestational age is rarely recorded in such situations and where recorded, tends to be based on imprecise information like self-reported maternal dates. With improved technological advancements in most developed countries, there is a continuing progress in neonatal intensive care, shifting the lower limit of viability towards younger gestational ages, with greater than 80% survival at 28 weeks gestation. [11,12] Such improvements are also being seen in some developing countries, especially in Asia with survival rates of 50–60% being recorded at 26–27 weeks gestation. [10-12] This is not same for some African countries with poor health infrastructure, conflicts and endemic poverty.

A proper understanding of the risk factors associated with preterm deliveries will lead to the reduction of the impact of these deliveries on neonatal mortality by reducing their incidence.
These factors though not direct, include history of previous pre-term birth, spontaneous pre-term rupture of fetal membranes, severe maternal hypertension, maternal age over fifty years, maternal anemia, maternal illness during pregnancy, previous abortion, nulliparity and low body mass index amongst others. [13-17]

There is paucity of data from African countries. [16,17] The study was therefore; carried out to estimate the prevalence of pre-term delivery in our center, identify possible associated factor(s) and their outcome.

METHODOLOGY

The study was a 1-year cross-sectional, descriptive study carried out at the SCBU of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria between 1st June, 2012 and 31st May, 2013. The SCBU of the hospital also serves as the referral center to three of its neighbouring States and the Niger republic. The unit attends to both booked and unbooked emergency cases with annual delivery rate of 2,800 to 3,200. Pre-term babies were defined as those babies whose delivery occurred between gestational age of 28 weeks and less than 37 completed weeks.

The case files of 195 preterm newborns admitted were reviewed; both maternal profile and newborn data including possible causes of the preterm delivery as recorded in the files were documented. Socio-economic status of parents/caregivers was documented based on their occupations and educational attainments using the Oyedeji classification scheme. [18] Babies with any documented congenital malformations were excluded.

Data analysis: Data from the proforma were entered into a personal computer using SPSS version 20.0 for Windows software. The data was manually sorted out for completeness before analysis. Frequency distribution tables for variables were generated. χ^2 test, where applicable and Fisher's exact test were used to test for significance of the differences between categorical variables. Level of significance was put at *P*<0.05.

RESULTS

Table I. Maternal and fetal characteristics of 195 preterm newborns.

Characteristics	Number	Percentage (%)
Gender		
Male	107	(54.9)
Female	88	(45.1)
Total	195	(100)
Birth weight (grams)		
<1000	21	(10.8)
1001≤ 1499	144	(73.8)
1500≤2499	30	(15.4)
>2500	0	(0)
Total	195	(100)
Gestational age (weeks)		
28<34	84	(43.1)
34<37	111	(56.9)
Parity		
Singleton	115	(59.0)
≥ Twins	80	(41.0)
Total	195	(100)
ANC		
Booked	92	(47.2)
Unbooked	103	(52.8)
Total	195	(100)
Place of Delivery		
Hospital	105	(53.8)
Home	90	(46.2)
Total	195	(100)

Neonatal admissions into the SCBU for the study period were 822 (9.2%) out of total deliveries of 2,115. Preterm admissions were 195 (23.7%) of that admission. Male preterms were 107(54.9%), while females were 88 (45.1%); with male to female ratio of 1.2:0.8. The pre-term delivery rate (<37 wks) was 95 per 1,000 deliveries. Early pre-term deliveries (<34 wks) were 84 (43.1%) and late preterm deliveries were 111 (59.9%). Table 1 shows the Maternal and fetal birth characteristics of 195 preterm newborns studied. The mean birth weight was 1484 grams ± SD 361grams (males; 1438grams and females; 1541grams: p = 0.079). Forty percent were products of multiple gestations while 59.5% were singletons. All the preterms were of low birth weight (<2500 grams) but, were appropriate for their gestational age. Extreme low birth weights (ELBW) were 21(10.8%), very low birth weights (VLBW) were 144 (73.8%) and low birth weights (LBW) were 30(15.4%). Commonly associated maternal ante natal characteristics significant as determinants of preterm delivery included infection, ante partum hemorrhage, hypertensive disorders and previous preterm delivery. Fifty nine (58.8%) of the mothers were of lower parity. Problems commonly observed amongst the preterms were neonatal sepsis, neonatal jaundice, apnea and respiratory distress as shown in Table 2. Outcome was significantly related to birth weight and gestational age (p = 0.0001), ANC (p = 0.009) and place of delivery (p = 0.0001) but, not to gender (p = 0.053) and multiple gestation (p = 0.266). Thirty percent (30.1%) died while, 69.9% were discharged home (Table 3). Forty six percent (46.2%) of the mortality cases were delivered at home and, 54.6% were from unbooked pregnancies.

Table II. Associated maternal and fetal conditions in 195 preterm newborns.

Conditions	Number of preterms	Percentage (%)
Maternal		
Ante partum haemorrhage	42	(21.5)
Previous preterm delivery	38	(19.5)
Multiple gestations	34	(17.4)
Hypertensive disorders	26	(13.3)
Infection	24	(12.3)
Premature rupture of fetal membrane	18	(9.2)
Others	13	(6.7)
Total	195	100
Fetal		
Neonatal sepsis	68	(34.9)
Neonatal jaundice	53	(27.2)
Respiratory distress	32	(16.4)
Apnea	27	(13.8)
Others	15	(7.7)
Total	195	100

Table III. Outcome of 195 preterm newborns.

	Number	Discharged (%)	Died (%)	p - value
Gender*				
Male	107	70	37	
Female	88	66	22	0.039
Total	195	136	59	
Birth weight*				
ELBW	22	4	18	
VLBW	69	42	27	0.0001
LBW	104	90	14	
Total	195	136	59	
Parity*				
Singleton	115	76	39	
Twins	64	50	14	
>Twins	16	10	6	0.266
Total	195	136	59	
Place of delivery*				
Hospital	142	110	32	
Home	53	26	27	0.0001
Total	195	136	59	

* p – value. P = 0.053
** p – value. P = 0.0001
*** p- value. P = 0.266
**** p- value. P = 0.0001

DISCUSSION

The prevalence of preterm delivery in the study was 23.7% (prevalence rate of 95 per 1,000 deliveries); though a hospital based study, it has demonstrated that pre-term delivery remains a significant health challenge. This rate is expectedly high because the study center is a tertiary center with referrals from other primary and secondary centers in its three neighboring States and Niger Republic. In the study area, most normal deliveries are taken in primary and secondary centers while, more complicated deliveries are referred to the teaching hospital. This often reduces the denominator with an exaggerated true pre-term delivery rates. Previous preterm delivery studies in Nigerian teaching hospitals depict this fact. [4,19] However, the pre-term delivery rate in this study is lower than the rates reported in previous studies from Benin [19,20] and Ilorin,[4] all in Nigeria. All these, might not be the true estimates of pre-term delivery rate in Nigerian tertiary health centers as many late uncomplicated pre-term deliveries will not be admitted, and many apparently healthy babies delivered without problem will be discharged.

Comparably, the prevalence rate reported in the current study is lower than the report from Zimbabwe (168 per 1,000) [21] but, similar to the prevalence of 20.3% reported from Malawi. [22] The study from Zimbabwe was also a hospital based study with a tendency for an exaggerated pre-term delivery rate while that of Malawi was a small community study in which a second trimester ultrasound scan was to estimate the gestational age. Like other poor resources settings, the rate is higher than the 5–10% reported by most European studies. [23,24] and the 12.5% reported from the United States of America. [25]

Many maternal socio-demographic and antenatal variables, including previous pre-term delivery, antepartum hemorrhage, premature rupture of membrane, urinary tract infection, pregnancy induced hypertension, place of delivery, booking status, has been identified as determinants of pre-term delivery . This study identified ante partum haemorrhage, previous pre-term delivery and multiple gestations as significant factors for pre-term delivery. Previous studies had demonstrated these associations. [15,17] In this study, most of the

women with antepartum hemorrhage had assisted medical delivery with over 62% medically induced to deliver. This was higher among pre-term subjects where 84.5% were medically induced to deliver. Our study shows that a history of preterm birth is a strong predictor of future preterm births, 20% of mothers in this study had a previous history of preterm delivery. This is similar to facts from literature. [4,15] Several other maternal and foetal conditions in the previous pregnancy such as pre-eclampsia, perinatal death and low birth weight were also associated with increased risks of preterm birth and high mortality in a subsequent pregnancy. [26,27] Multiple gestations was also strongly associated with preterm delivery in this study, 17% of the mothers had multiple gestations. Hypertensive disorders in pregnancy have been associated with pre-term delivery in previous studies. [15,28] This study also found an association between pregnancy induced hypertension and pre-term delivery. Premature rupture of membranes, as in other studies [15,28] was identified as a determinant of pre-term delivery in the current study. This study showed an association between infection and preterm delivery; previous studies have shown that infection including, chorioamionitis, TORCHES, urinary tract infection amongst others increases the risk of pre-term labour. [29-31] Infection stimulates the production of cytokines including interleukin-1, a known stimulant of labor through the production of prostaglandins from uterine tissue leading preterm labor. [32,33]

Maternal reasons identified to be predominant causes of medical intervention leading to pre-term delivery in this study were antepartum hemorrhage and hypertensive disorders in pregnancy. Booking status of subjects was also identified as the strongest determinant of pre-term delivery. A woman, with a booked and well supervised pregnancy is likely to have any obstetric emergency detected earlier, and with appropriate management, may have her pregnancy carried to term.

CONCLUSION

Pre-term deliveries are common in our hospital therefore; health promotion and female education, proper antenatal care, early diagnosis and management of medical disorders of pregnancy will significantly reduce the incidence of pre-term deliveries. This is a good strategy towards achieving MDGs 4 and 5.

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