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Pattern Of Admission And Outcome Among Neonates Admitted Into The Special Care Baby Unit Of Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria

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Abstract
Introduction: *The neonatal disease pattern is a sensitive indicator of the availability, utilisation and effectiveness of mother and child health services in the community. Community based data are difficult to come by, so hospital based data most often is use to assess the burden of neonatal problems.*
Aim*: To determine the pattern of morbidity, mortality and outcome of neonates admitted into the Special Care Baby Unit (SCBU) of the Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto from 1st January 2022 to 31st December 2022.*
Methods: *A hospital-based retrospective review of medical records of neonates admitted into the SCBU of UDUTH, Sokoto from 1st January, 2022 to 31st December, 2022. Information retrieved included the biodata, place of birth, age at admission, diagnosis, duration of hospital stay and outcome. Data was analysed using SPSS version 22.*
Results: *A total of 818 neonates were admitted during the study period, 393(48.0%) were males and 425(52.0%) were females giving a male to female ratio of 1:1.1. Most 606(74.1%) of the patients were out born. Birth Asphyxia 245(30.0%) was the main reason for admission, followed by prematurity 182(22.3%). Majority 653(79.2%) were discharged, 16(2.0%) left against medical advice, while 149(18.2%) of the admitted patients died. Prematurity related death 61(40.9%) and birth Asphyxia were the leading causes of death respectively. Majority 107(71.8%) of the deaths occur among the out-born.*
Conclusion: *Birth asphyxia and prematurity related complications were the main reasons for neonatal admissions and the leading causes of death in this study. Most of the neonatal deaths were from preventable causes. Strengthening perinatal care, emergency obstetric services, facilities for improved preterm care should be provided in secondary and tertiary health facilities and improving the skills of health care providers on neonatal resuscitation are necessary to reduce neonatal mortality.*
Keywords*: Admission, Outcome, Neonates, Special Care Baby Unit, Usmanu Danfodiyo University Teaching Hospital, Sokoto*

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I. Introduction

The neonatal period is the most critical period for child survival as the risk of death is highest during this time (Olorunsaiye et al, 2020). Neonatal mortality accounts for 50% of all mortality in children under the age of five globally and about two thirds of infant mortality (Akinyemi et al, 2015). Most of the neonatal deaths occur in the first week of life (Olorunsaiye et al, 2020). In Nigeria, about 241,000 newborns die from preventable and treatable causes giving a neonatal mortality rate of 39/1000 live births (Nigeria Demographic and Health Survey, 2018). This is highest in Africa and the second highest in the world (Uchenna et al, 2015). Neonatal morbidity and mortality rate have great impact on the Sustainable Development Goal 3 (SDG 3). The target of SDG 3 is to reduce neonatal mortality to at least as low as 12 per 1,000 live births by 2030, Nigeria may not attain Goal 3 of the SDGs by the year 2030 because of the slow progress been recorded (Nigeria Demographic and Health Survey, 2018). Fajolu et al (2022) reviewed admissions record of 2,959 neonates admitted at the Lagos University Teaching Hospital, Nigeria, from January 2018 to April 2020, the most common diagnoses reported were neonatal jaundice (28.4%), infection (28.0%), prematurity with associated complications (22.1%), and hypoxic ischemic encephalopathy (18.2%). The overall mortality rate reported from Fajolu et al study was 17.6% and prematurity with associated complications was responsible for majority (39.2%) of the mortalities. Another hospital-based retrospective study by Atlaw & Shiferaw (2022) in Ethiopia, among 155 sick neonates admitted in the Neonatal intensive care unit from 2019 to 2021, reported that sepsis was the main reason for admission in 58(37.4%), followed by birth asphyxia 12(7.7%), and neonatal jaundice 10(6.4%), most 133 (85.8%) of the patients were discharge, while 17(10.9%) of the admitted patients died. The

neonatal disease pattern is a sensitive indicator of the availability, utilisation and effectiveness of mother and child health services in the community (Atlaw & Shiferaw, 2022). Community based data are difficult to come by, so hospital based data most often is use to assess the burden of neonatal problems (Atlaw & Shiferaw, 2022). This study aimed to determine the pattern of morbidity and outcome of neonates admitted into the Special Care Baby Unit (SCBU) of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto from 1st January 2022 to 31st December 2022.

II. Methods

The study was carried out at the SCBU of the Usmanu Danfodiyo University Teaching Hospital, Sokoto. The hospital is a tertiary health facility located in Sokoto, the Sokoto state capital, North -Western Nigeria. It serves as a referral centre for more than 10 million people from Sokoto, Zamfara, Niger, Katsina and Kebbi states of Nigeria and the neighbouring Niger and Benin Republic in the West African sub-region. The UDUTH, Sokoto has a special care baby unit where neonates in need of intensive and special care are managed. Facilities available in the SCBU include 9 incubators, 2 resuscitaires, and 7 phototherapy machines; the unit have neither mechanical ventilator nor a CPAP machine, continuous positive pressure ventilation is provided via improvised bubble CPAP. Oxygen is delivered through nasal prongs or nasal catheter from oxygen cylinders or oxygen concentrators. The SCBU is a 30 bedded capacity, with a nurse: patient of 1:8 during the morning shift, and 1:15 during the afternoon and night shifts. In addition, there are usually 3 consultants, 2 to 3 senior residents, 3 junior residents, and 2 to 3 intern doctors covering the neonatal unit.

The study was a retrospective study of the records of neonates that were admitted into the neonatal unit from 1st January 2022 to 31st December 2022. Data of all neonates admitted into the SCBU were collected from the admission and discharge register and case notes of the admitted patients. Information extracted included the age of the neonates as at the time of admission, sex, gestational age at birth, weight on admission or at birth, duration of hospital stay, diagnosis and outcome. Inborn referred to babies that were delivered in UDUTH, while out-born are babies that were not delivered in UDUTH. Approval for the study was obtained from the hospital ethics committee. Data was analysed using SPSS version 22.

III. Results

A total of 818 patients were admitted during the study period. Three hundred and Ninety Three (48.0%) were males and 425(52.0%) were females giving a male to female ratio of 1:1.1. Most 401(65.4%) of the patients were born outside UDUTH (out born) (Table 1).

Table 1: Demographic characteristics of neonates admitted into SCBU of UDUTH Sokoto

Variables	Frequency (n = 818)	Percent (%)
Age at admission (in hours)		
< 48	516	63.1
≥ 48	302	36.9
Mean age at admission = 31.15 ± 8.49 hours		
Sex		
Female	425	52.0
Male	393	48.0
Place of delivery		
Hospital	613	74.9
Home	205	25.1
Hospital of delivery		
UDUTH	212	34..6
Outside UDUTH	401	65.4
Gestational age at birth		
Term	636	77.7
Preterm	182	22.3

The trend of neonatal admissions showed admissions peaked in the month of March and May (figure 1).

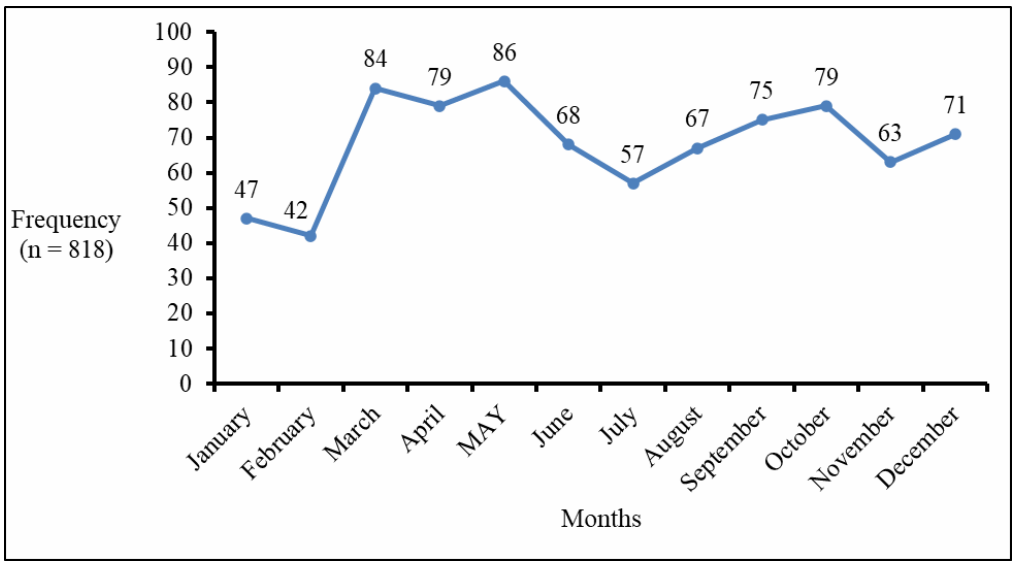

Figure 1: Trend of neonatal admissions in the SCBU of UDUTH Sokoto in the year 2022

The main reason for admission in this study was due to Birth Asphyxia, followed by prematurity in 245(30.0%) and 182(22.3%) respectively. Few others were admitted due to congenital anomalies such as hydrocephalus, congenital heart disease and encephalocoele which accounted for18(2.2%) of the admissions (Table 2).

Table 2: Pattern of neonatal admission in the SCBU of UDUTH, Sokoto

Reason for admission	Frequency (n = 818)	Percent (%)
Prematurity	182	22.3
Asphyxia	245	30.0
Neonatal Jaundice	135	16.5
Septicemia	214	26.1
Meconium Aspiration Syndrome	11	1.3
Neonatal Tetanus	7	0.9
Transient Tachypnea of the Newborn	6	0.7
Others	18	2.2

Of the 818 neonates admitted, 648 (79.2%) improved and were discharged, while 149(18.2%) of the admitted patients died (table 3).

Table 3: Outcome of neonatal admission in the SCBU of UDUTH, Sokoto

Outcome of admission	Frequency (n =818)	Percent (%)
Discharged	648	79.2
Died	149	18.2
Transfer out	4	0.5
Singed against medical advice	17	2.1

Prematurity related death was responsible for most 61(40.9%) of the mortalities in this study, followed by birth Asphyxia in 59(39.6%) (Table 4).

Table 4: Causes of neonatal death In the SCBU of UDUTH, Sokoto

Cause of death	Frequency (n = 149)	Percent (%)
Prematurity	61	40.9
Asphyxia	59	39.6
Neonatal Septicemia	16	10.7
Neonatal Tetanus	5	3.4
Acute Bilirubin Encephalopathy	2	1.3
Meconium Aspiration Syndrome	1	0.7
Others	5	3.4

IV. Discussion

In this study a total of 818 were seen over one year period, 2963 neonates were seen over a six year period at Aminu Kano Teaching Hospital in Northern Nigeria (Mukhtar-Yola & Iliyasu, 2007), while 646 neonates were seen over a 2-year period at the University of Abuja Teaching Hospital Gwagwalada, Abuja in Nigeria (Okechukwu et al, 2009), while another study in Jos, North Central Nigeria reported 572 neonatal admissions over one year period (Toma et al, 2013). More (52.0%) females were seen in this study than males (48.4%), this is contrary to the report by Toma et al in Jos, Nigeria (Toma et al, 2013) and Fajolu et al (2022) in Lagos that reported more males than females in their studies. There was predominance of out-born patients (65.4%) than in-born. This corroborates the findings a study carried out at Aminu Kano Teaching Hospital in Northern, Nigeria (Mukhtar-Yola & Iliyasu, 2007) that also documented a predominance of out-born babies (50.9%) when compared to in-born babies (49.1%).

The leading causes of admission in this study were perinatal asphyxia, prematurity, neonatal sepsis and neonatal jaundice. These are similar to the leading causes of admission in Northern Nigeria (Mukhtar-Yola & Iliyasu, 2007; Okechukwu et al, 2009). Similarly, our finding is also consistent with the findings of a study carried out by Toma et al (2013) among 572 neonates admitted into neonatal unit of Jos University Teaching Hospital, Nigeria, reported that the main causes of admissions were neonatal infections, prematurity and birth asphyxia in 37.1%, 20.1%, 11.5% cases respectively.

The mortality rate in this study is 18.2%. It is lower than 20.3% reported by a study in Benin- city, Nigeria (Omoigberale et al, 2010), and 19.4% reported by Toma et al in Nigeria (2013) when compared to the present study and also lower than 19.3% documented at calabar, Nigeria (Udo et al,. 2008). But, however, the mortality rate in this study is higher when compared to a mortality rate of 13.3% reported at Gwagwalada-Abuja in Nigeria (Okechukwu et al, 2009) and 16.9% at Aminu Kano Teaching Hospital in Northern, Nigeria (Mukhtar-Yola & Iliyasu, 2007). The high mortality recorded in this study may be due to the fact that the majority (65.4) of the patients in this study were out-born, Obi & Onyire (2004) in Abakaliki, Nigeria reported high mortality from birth asphyxia and prematurity in their study particularly among the out-born, which they attributed to delivering the out-born babies in poorly equipped environment and inexperienced health personnels. There is a great variation in neonatal death rates between NICUs from different parts of the world, this variation in mortality can be explained by several reasons such as severity of neonate's illness, the level of care in the studied NICU, skill of the staff, and doctor-patient ratio (Atlaw & Shiferaw, 2022).

The leading cause of death in this study is prematurity followed by perinatal asphyxia; this is in tandem with the report of Toma et al in Nigeria (2013) and Abdellahi Weddih et al in Mauritania (2019). But in variance with the findings of Okechukwu et al (2009) that reported peri-natal asphyxia as the leading cause of death at the University of Abuja Teaching Hospital Gwagwalada- Abuja. While neonatal sepsis is the leading cause of death in study done in the Niger Delta (Ugwu, 2012) and it accounted for 25.7% of the deaths. Prematurity related as the leading cause of mortality in this study may be due to the majority of the preterm were out born, and were transported to our facility hypothermic in unhygienic conditions leading increase mortality and morbidity like septicaemia and hypothermia, it could also be that the mothers of this neonates had no corticosteroids before delivery that has been reported to reduce Respiratory distress Syndrome in the preterm, coupled with unavailability of facilities in the unit that have been shown to improve outcome in preterm neonates such as bubble CPAP machine and mechanical ventilator.

V. Conclusions And Recommendations

The neonatal mortality in this study is high. The leading causes of mortalities are prematurity and birth Asphyxia, which were similar to previous reports in Nigeria, and are largely preventable. Strengthening perinatal care, emergency obstetric services, facilities for improved preterm care should be provided in secondary and tertiary health facilities and improving neonatal resuscitation skill of the health care providers are necessary to reduce the neonatal mortality.

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