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Spectrum of Diseases seen on Neonatal Ward at Komfo Anokye Teaching Hospital, Kumasi, Ghana

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Abstract

Objectives: This study aimed to determine the spectrum of diseases admitted to the neonatal unit of a Teaching Hospital in Ghana.

Methods: Prospective cross-sectional descriptive study done on Mother Baby Unit (MBU), the neonatal ward, of Komfo Anokye Teaching Hospital, Kumasi. Data were collected daily between 8 hrs and 20 hrs GMT. Information was obtained from both the clinical team and the mothers of the neonates. Data obtained included age, weight, sex, place of delivery and diagnosis including congenital anomalies and syndromes. Analysis was done using Stata version 12. Ethical approval was obtained from Committee on Human Research Publication and Ethics. Informed consent was obtained for each neonate before recruitment.

Results: A total of 1580 neonates were recruited during the study period, 57.03% were normal males, 42.22% were normal females while 0.76% had ambiguous genitalia. Majority of the neonates, 64.87% were delivered at KATH labour ward, 23.96% were delivered at hospitals and clinic within Kumasi but outside KATH and 11.27% from outside Kumasi. The reasons for admission were neonatal sepsis (38.10%), birth asphyxia (27.91%), neonatal jaundice (18.86%), congenital malformations (7.09%), syndromes (1.77%) and genital anomalies (1.47%). Prematurity was the cause of admission for 31.27% of babies.

Conclusion: Majority of admissions at MBU is from KATH labour ward with most of them having neonatal sepsis and birth asphyxia. Admissions due to congenital malformations including syndromes are quite significant. There is the need to improve delivery practices to prevent or reduce asphyxia.

Keywords: Neonate, Neonatal sepsis, Birth asphyxia

Introduction

Over the past decade, there has been a decline in neonatal mortality rate. It was reported that 4 million neonatal died in 2005 [1]. Neonatal mortality rate reduced to 3.1 million and 2.9 million respectively in 2010 and 2014 [2,3]. Despite some improvement, the decline in neonatal mortality is not satisfactory particularly in African countries as we still have over nine million babies dying every year during the perinatal and neonatal periods and nearly all (98%) of these deaths occur in developing countries [1,4]. Neonatal mortality contributes between 40-70% of infant mortality [1,4] and about 60% of all under 5 mortality [5]. Therefore, improving supervised delivery, obstetric practices and effective management of neonatal morbidities are important to neonatal survival and long term improvement in the neonatal mortality [6] especially in developing countries.

Prematurity is a significant cause of neonatal morbidity and mortality. Ali et al. [7] found out that prematurity was the commonest cause of admission to a second care hospital in Paskistan. In Nigeria, Toma et al. [8] found the commonest cause of admission among neonates in a tertiary hospital was neonatal infections followed by prematurity. In India, neonatal sepsis and birth asphyxia were the commonest cause of neonatal morbidity [9]. In Kenya, bacterial infections and prematurity were found to be the important causes of neonatal morbidity both at the district and rural hospitals [10,11]. Neonatal sepsis was found to be the most important cause of neonatal morbidity and mortality in Northern part of Ghana [12].

Neonatal jaundice can be a worrisome cause of neonatal admissions to hospitals [5,7,9,11]. Congenital anomalies are causes of neonatal morbidity [13] in many parts of the world. One in 40 infants is born with congenital malformation [14]. More than 4,000 syndromes have been defined and many of them are associated with severe morbidity [14,15]. It is therefore important that they are diagnosed immediately at birth so that appropriate management and follow up plan can be instituted [16]. To this effect many countries have newborn

screening programs for early diagnosis, management and follow up plan [14].

There has not been any previous study describing the causes of neonatal morbidity at the Mother Baby Unit (MBU), neonatal unit, of Komfo Anokye Teaching Hospital (KATH) and hence the motivation to do this study.

Methods

The study was a prospective cross-sectional descriptive, conducted on neonates admitted to MBU for a period of four month between 1st October, 2014 to 31st January, 2015. MBU is the neonatal Unit of KATH, Kumasi, Ghana. It is the main referral neonatal Unit of the Northern Sector and the middle belt of Ghana. Sick babies less than three months old are usually admitted to the Unit. An average of four hundred babies are admitted to the unit every month.

Sick babies are usually admitted to the unit through KATH labour wards, pediatric outpatient department at the polyclinic and specialist consulting rooms and directly from other hospitals and facilities. Patients admitted to MBU are managed till they are stable and well enough to be discharged. All babies admitted to the unit were eligible to participate in this study.

Data were collected daily between 8 h and 20 h GMT. Information was obtained from both the clinical team and the mothers of the neonates. Data were collected on Case Report Form (CRF) which was designed to capture demographic (sex, age at admission) and clinical diagnoses. Data were entered onto a predesigned electronic CRF using Epi-Info version 3.5.1 and transferred to Stata version 12 (Stata Corp, TX, USA), for analysis. Continuous variables were summarized and presented as mean with standard deviation as well as median with corresponding ranges. Single categorical variables were tabulated and expressed as percentages. The relationships between causes of morbidity on MBU and the various categorical variables were determined using analysis of variance.

Informed consent form (ICF) detailing the study purpose, benefit, and possible risks to the babies was provided. Authorization to conduct the study was obtained from the Head of Department of Child Health and the Medical Director of KATH. Ethical clearance was obtained from the Committee on Human Research Publication and Ethics of the Kwame Nkrumah University of Science and Technology, Kumasi, Ghana. Written informed consent was obtained from the mothers of the neonates before recruitment.

Results

Within the study period 1661 babies were admitted to the neonatal ward, out of which 1580 (95.12%) were recruited. Seventy eight (4.70%) babies were observed and discharged same day because they were well while three mothers (0.18%) refused informed consent and so the babies were not recruited. With regard to sex of the neonates, 57.03% were normal males, 42.22% were normal females while 0.75% had ambiguous genitalia. Majority of the babies, 64.87% were delivered at KATH labour ward, 23.96% were delivered at hospitals and clinics within Kumasi but outside KATH and 11.27% from outside Kumasi.

The reasons for admission were neonatal sepsis (38.10%), birth asphyxia (27.91%), neonatal jaundice (18.86%), congenital malformations (7.09%), syndromes (1.77%) and genital anomalies (1.47%). Prematurity was the cause of admission for 31.27% of babies **Tabel 1**.

Table 1: Reasons for Admission.

Reason	Frequency (N)	Percentage (%)
Neonatal Sepsis	602	38.10
Birth Asphyxia	441	27.91
Neonatal Jaundice	296	18.73
Congenital anomaly	114	7.22
Others	127	8.04
Total	1580	100.00

Musculoskeletal defects included omphalocele, gastroschisis, talipes equinovarus, extra digits, cleft lip/palate and bladder exostrophy. Nervous system defect included neural tube defects and anencephaly.

Gastrointestinal defect included duodenal atresia, pyloric stenosis and Hirschsprung disease **Table 2**.

Table 2: Congenital Anomalies.

Anomaly	Frequency (N)	Percentage (%)
Musculoskeletal defect	38	33.33
Nervous system defect	26	22.80
Anorectal malformation	14	12.28
Ambiguous genitalia	12	10.53
CHD	12	10.53
Gastrointestinal anomalies	10	8.77
Sacrococcygeal teratoma	1	0.88
Cystic hygroma	1	0.88
Total	114	100.00

23 babies had genital abnormalities **Table 3**.

Table 3: Abnormal Genitalia.

Genitalia	Frequency (N)	Percentage (%)
Normal Genitalia	1557	98.54
Genital abnormalities	23	1.47
Total	1580	100.00

Commonest syndrome was Down syndrome **Table 4**.

Table 4: Syndromes.

Syndromes	Frequency (N)	Percentage (%)
Down syndrome	8	
Patau syndrome	4	
Turner syndrome	3	
Beck With Wiederman	2	
Pierre Robin syndrome	1	
Moebius syndrome	1	
Noonan syndrome	1	
Oesteogenesis imperfecta	1	
Edward syndrome	1	
Athroglyposis	1	
Velocardiofacial	1	
Syndromic babies	4	
Total	28	

Discussion

This study demonstrated the huge admissions to the MBU. Similar pattern of heavy neonatal admission was documented by Toma et al. [8] at Jos University Teaching Hospital situated in North Central Nigeria. In our study, we recruited a total of 1580 babies and 64.87% were inborn and 57.02% were males, 42.22% were females and 0.76% had ambiguous genitalia denoting DSD. This trend of having more males being admitted to neonatal units has been found in other studies [7,8,11,17] and this is partly because the male baby is more susceptible to diseases, both communicable and non-communicable, than the female baby [18,19].

The commonest cause of morbidity found on MBU was neonatal sepsis (38.10%), followed by prematurity (31.27%), birth asphyxia (27.91%) and neonatal jaundice (18.86%). Similar pattern was observed in Kenya [11], Pakistan [7] and Indian [9]. However, some studies in Nigeria [8,20] and in India [17] rather found prematurity and low birth weight as the commonest cause of admission to neonatal wards. In our study, however, most of the premature babies were also treated for neonatal sepsis.

Congenital anomalies were the cause of morbidity for 7.22% of neonates admitted to MBU for the period of study. The most common congenital anomaly was musculoskeletal defect (33.33%). The other congenital anomalies included nervous system defects (22.80%), anorectal malformation (12.28%), ambiguous genitalia (10.53%), congenital heart diseases (10.53%), and gastrointestinal anomalies (8.77%). Similar pattern has been found in Kenya [21], Uganda [22] and Egypt [23]. However, in Tanzania, Mashuda et al. [24] found central nervous system anomalies to be the commonest. The sample size in the Tanzanian study was 445 and most of the mothers did not take folic acid in pregnancy while our sample size was 1580 and 97.35% took folic acid and other recommended medications during pregnancy. Genital abnormalities were found in 1.47% of the babies admitted to MBU. The most common genital abnormalities was ambiguous genitalia (disorder of sexual development), followed by isolated micropenis. It is quite surprising that the other studies on morbidity and congenital anomalies in babies did not consider genital anomalies. Genital anomalies are not uncommon among neonates [25] and important source of psychological stress to families and can be a cause of medical emergency in case of congenital adrenal hyperplasia [26,27] and they should always be looked for at the labour and neonatal wards. Even in our study we did not diagnose any male baby with congenital adrenal hyperplasia (CAH). Males with CAH have normal genitalia but could have slightly bigger penis with hyperpigmented scrotum, features that may be very subjective in the African population and therefore evade diagnosis. A male neonate with salt losing CAH could present with recurrent vomiting and shock. Such a neonate would likely be treated for neonatal sepsis and may die unnoticed [28] and such death would be wrongly recorded as due to neonatal sepsis and not due to CAH.

Syndromes were found in 1.77% of the neonates studied. Down syndrome was the commonest syndrome identified. Other syndromes included Patau, Turner, Beckwith Wiederman, Perre Robin, Moebius, Noonan, Edward, velocardiofacial syndromes, Oesteogenesis imperfect and Arthrogryposis multiplex congenita. Four of the syndromes could not be diagnosed and so we simply tagged them “syndromic babies”. We believe that congenital malformation and syndromes among babies are under reported as in some communities in Ghana these babies are not brought to hospital for medical intervention but rather end up in infanticide according to remote traditional believe that they are rather ‘spirits’ and so they cannot live among human beings [29].

There is no organized clinic for patients with syndromes at KATH. The long term outcomes of these patients are not know and may be disastrous as we do not know where they end up.

Conclusion

Majority of admissions to MBU is from KATH labour ward with high neonatal sepsis, prematurity and birth asphyxia. Therefore this study calls for an improved labour practices to prevent neonatal infections and asphyxia. Congenital anomalies including syndromes are not uncommon among neonates admitted to MBU and therefore supervised care and long term follow up plan are needed for such neonates.

Recommendation

Regular grand rounds between the departments of obstetrics and child health are important to improve neonatal outcome. Males neonates who are diagnosed as neonatal sepsis without laboratory evidence and support should be further evaluated for congenital adrenal hyperplasia. It would be clinically helpful if the Child Health Department, KATH, could have a follow up clinic for babies with congenital anomalies and syndromes.

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