

Prevalence, Pattern and Outcome of Congenital Anomalies Admitted to a Neonatal Unit of a Resource Limited Setting

Umma Idris Abdullahi *

Department of Paediatrics, Federal Medical Centre, Birnin Kudu, Jigawa State, Nigeria.

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Abstract

Introduction: Congenital Anomalies contribute significantly to the neonatal morbidity and mortality. This study aimed to document the Prevalence, Pattern, and Outcome of Congenital Anomalies Admitted to a Neonatal Unit of a Resource Limited Setting.

Method: This was a facility-based, retrospective, observational, descriptive study conducted in the Special care baby Unit of a tertiary hospital in Nigeria, from June 2015 to May 2025.

Results: Twenty-eight newborns admitted during the study period had CA, which constituted 1.4% of the total admissions. The study cohort consisted of 76% males and GI was the commonly affected system. Majority of mothers did not attend antenatal care.

Conclusion: This study found a low prevalence of Congenital Anomalies among babies admitted during the study period. The GI systems was commonly affected system. It is recommended that mothers should receive adequate preconception care and antenatal care to prevent and allow for early diagnosis and prompt treatment of congenital Anomalies.

Keywords: Congenital Anomalies; Birth Defect; Malformations; Neonates; Neural Tube Defects; Nigeria; Jigawa State; Resource Limited Setting

1. Introduction

Prevalence, Pattern, and Outcome of Congenital Anomalies Admitted to a Neonatal Unit of a Resource Limited Setting
Congenital abnormality (CA), which is defined as structural or functional anomalies that occur during intrauterine life, an estimated 6% of babies worldwide are born with CA annually.(1) Congenital disorders are one of the main causes of the global burden of disease, and low- and middle-income countries are disproportionately affected, accounting for 94% of global cases and are a leading cause of under-five mortality. Sub-Saharan Africa and Southern and Central Asia bear 80% of this burden.(1)

Around the world each year, an estimated 295 000 newborns die before reaching 4 weeks of age due to congenital disorders and associated complications.(2) It accounted for about 11.9% of total mortality in a recent study in Nigerian neonates. CAs contribute to childhood disabilities significantly impacting individuals and families, health-care systems and societies.(2)

* Corresponding author: Umma Idris Abdullahi

The International Classification of Diseases classified CAs by the body system affected, where major anomalies affect the infant's life expectancy, health status, physical or social functioning. On other hand, "minor" anomalies are those with little or no impact on health or short-term or long-term function.(3)

Genetic causes,(1) consanguinity,(4) Advanced maternal age,(5) low socio-economic class, infectious, nutritional or environmental factors are linked to the etiology of CA. However, about half of cases of CA cannot be linked to a specific cause.

Some congenital disorders can be prevented through vaccination, adequate intake of folic acid or iodine through fortification of staple foods or supplementation, and adequate care before and during a pregnancy.(6)

The prevalence of CA in Africa is estimated to be 20.4 per 1000 with the highest reported in South Africa.(7-13) The reported prevalence from Ghana, Ethiopia, and India were 8.6%,(14)8.3%,(15) and 4.3%(16) respectively. In Nigeria the prevalence, pattern and outcome of CA varied from place to place. There has not been a documented prevalence of congenital anomalies from Jigawa state, hence the need to document the prevalence, pattern and outcome of CA among babies in Jigawa.

2. Methodology

This was a facility-based, retrospective, observational, descriptive study conducted in the Special care baby Unit of Federal Medical Center Birnin Kudu, Jigawa State, Nigeria, from June 2015 to May 2025. The study was approved by the Hospital Research and Ethics Committee of the center.

2.1. Eligibility criteria

All consecutive newborns with CA admitted during the study were included. Major malformations are defined as malformations that are life-threatening, require surgery, or present a significant disability. Newborns with incomplete records were excluded.

2.2. Data collection

Data were collected from the medical records of babies with CA using data extraction form. The diagnosis was based on physical examination by the Medical Doctors in the SCBU, and relevant investigations including imaging studies.

Data extracted included birth weight, gender, as well as outcomes, were recorded. Maternal information such as maternal parity, gestational age, education, antenatal care and Ultrasound imaging in the index pregnancy.

2.3. Statistical analysis

The frequency and pattern of malformations and final outcome were noted as outcome variables. Statistical analysis was done with IBM SPSS Statistics for Windows, version 27. The results were analyzed as simple percentages, and bar chart. The CAs were classified based on organ systems for ease of identification.

3. Results

Among 2005 newborn admissions during the study period, 28 newborns had CA, which constituted 1.4% of the total admissions. However, only 24 case folders were retrieved and analyzed in this study. The study cohort consisted of 76% male (n=19) and 24% female (n=5) infants; all the babies were full term, with 36% (n=9) being low birth weight. Of the infants with CA in the study, 84% (n=21) were born by normal vaginal delivery (Table 1).

Table 2 showed that majority of the mothers did not attend ANC and lack formal education.

Gastrointestinal system was the commonly affected system, followed by CNS. Three of the babies had Multiple CA as more than one organ system is affected (Table 3).

As depicted in figure 1, 3/24 (12.5%) the babies died.

Table 1 Characteristics of Babies with CAs

Characteristics	Variable	Frequency	Percentage
Gender	Male	19	76
	Female	5	24
Birth Weight (Kg)	Less than 2.5	9	36
	More than 2.5	15	64
Place of Delivery	Home	20	83.3
	Hospital	4	16.7

Table 2 Maternal Characteristics

Characteristics	Variable	Frequency	Percentage
Age (Years)			
	Less than 20	3	12.5
	21-25	12	50
	26-30	7	29
	31-35	2	8.5
Parity			
	Primipara	2	8.5
	Para 1 to 3	19	79
	>Para 4	3	12.5
Educational Level			
	No formal Education	22	91.5
	Primary level	2	8.5
ANC attendance	Yes	8	33.3
	No	16	66.7
Antenatal USS	Yes	8	33.3
	No	16	66.7

Table 3 Distribution of the CAs

Malformation	Frequency	Percentage
Gastrointestinal	7	29
Anorectal Malformation	2	
Omphalocele	3	
Gastroschisis	1	
Pyloric Stenosis	1	

CNS	5	21
Neural Tube Defect	5	
Suspected Chromosomal	2	8.4
Downs Syndrome	2	
Musculo-skeletal System	3	12.4
Congenital Talipes Equinovarus	2	
Soft tissue sarcoma	1	
Urogenital System	2	8.4
Posterior Urethral Valve	1	
Hydrocele	1	
Multiple Congenital Anomaly	3	12.4
Others	2	8.4
Cystic hygroma	1	
Cleft lip	1	
Total	24	100

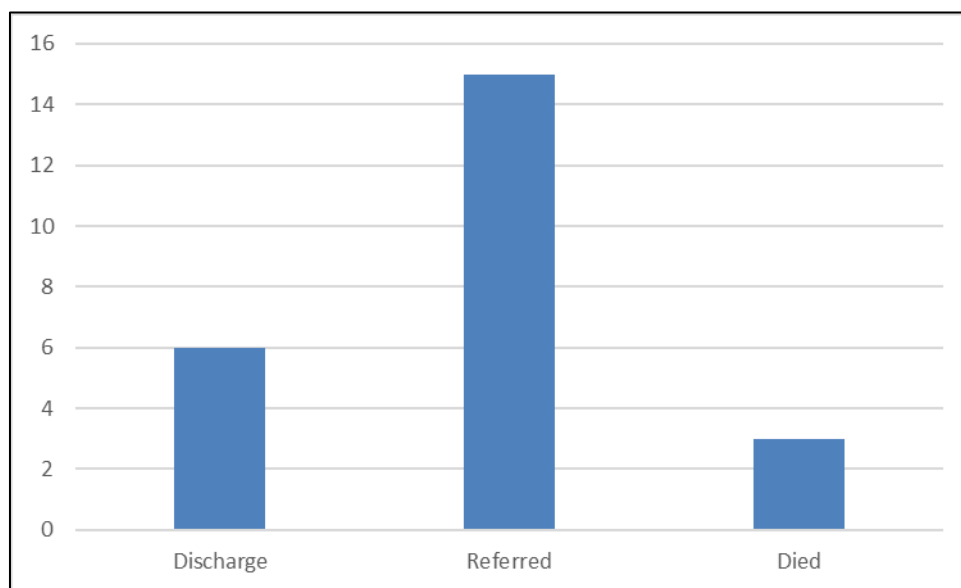


Figure 1 Outcome of the babies with Congenital Malformations

4. Discussion

The prevalence of congenital malformation in this study is found to be 1.4%. this lower than the 2.8% to 6% previously reported from other parts of Nigeria.(7,8,11,13,17) This could be due to differences in methodology, sample size, geographical location, and health seeking behavior of the populace. Mothers in this study have low literacy level, ANC patronage and in-facility delivery, this finding is in keeping with the recent NDHS finding.(18) lack of ante-natal care or delay in commencing ante natal-care (with attendant inability to receive, or delay in receiving, some necessary micronutrient and other supplementation such as folic acid), especially in the early period of pregnancy when organogenesis begins, may have contributed to the occurrence of congenital abnormalities.

Furthermore, some babies with CA do not present to the neonatology unit but are seen at other specialist units such as Paediatric surgery unit or neuro-surgery unit etc. Additionally, some of these babies with CA sought alternative care

from traditional healers or left at home with no treatment due to some cultural beliefs and or poverty. Hence, the prevalence rate of 1.4% obtained in this study may not be reflective of the true prevalence of the CA in the general population as this was purely a hospital-based study.

Majority of the CA was reported among mothers aged between 20 to 30 years, which is in keeping with the findings of Ogbale and co-authors in Ibadan,(19) Swati and colleagues from Sokoto.(20) However Advanced maternal age more than 35 years was reported to be significantly associated with CA by other authors.(13)(17)

All the third of the mothers whose babies had congenital abnormality attended antenatal clinic, and had USS done but no CA was detected. The non-detection of CA during USS in this study may be due to the level of the expertise of the radiologist, timing of the USS, and the nature or type of the CA.(21,22)

This study found male preponderance, which similar to what was documented by other authors,(13,23,24). It is been postulated that the earlier time of gestation at which male reproductive organs develop and their susceptibility to excess hormone levels may account for the increased level of male urinary and reproductive defects.(25) Also, the interaction of sex hormones and system development has been cited as possible causes of sex differences in some anomalies including cleft palate and lip.(26)

the commonest system affected by CA in this study is GI, which is similar with the findings from Kano,(10) Anambra,(11) Jos(7) and India(16),. In contrast to Central nervous system abnormalities found in Sokoto(13), Cardiovascular System in Asaba,(17) Delta State. These differences in the pattern of distribution of system affectation might be due to varied methodology, for instance, the Asaba study used echocardiography paucity in investigative procedures such as karyotyping and aversion for autopsy in the study area.

Three babies died in-facility in this study, giving a mortality rate of 12.5%, which is lower than the 17.7 to 43.5% reported from other centers.(14,16,17,19). The variation may be due to severity of the CA and the level expertise at the different facilities.

5. Conclusion

The prevalence of CA in Federal Medical Centre state is low, with GI system commonly involved. It is recommended for mothers to plan their pregnancy (preconception folic acid supplementation) prevent occurrence of CA, and to register for ANC early to enable early diagnosis and prompt treatment of CA.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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