A Retrospective Study of the Epidemiology of Congenital Anomalies at The John F. Kennedy Medical Center

Ayun Cassell III, Atem Geu, Patrick Okao, Peter Coleman, Samuel Freeman-Liberia

Background: Congenital anomalies are a global problem. Every year an estimated 7.9 million children are born with serious birth defects and 3.3 million children under the age of five years die because of birth defects. Among those that survive, 3.2 million children may be disabled for life. Data on the prevalence of congenital anomalies among neonates in Liberia is lacking.
Objective: To determine the prevalence of gross congenital anomalies among neonates treated at the John F. Kennedy medical center.
Methods: We conducted an 18-month retrospective study between January 2015 to June 2016. All neonates delivered at this center, or referred in for care during study period were included. Data on gross congenital anomalies were extracted from the neonates' charts. Type of gross congenital anomaly was determined from the physical examination findings at delivery or time of referral. Other variables reviewed included: age, gender, place of delivery, type of delivery, gestational age, maternal age, antenatal attendance, history of maternal infection and drug use.
Results: A total of 42(2.1%) gross congenital anomalies were found out of the 2037 neonates studied. The male to female ratio was 1:1. The commonest gross congenital abnormalities were: abdominal wall defects (omphalocele and gastrochisis) 17(41%) and neural tube defects 10(24%). There were 17(40%) neonates with congenital anomalies delivered at home. Those born by vaginal delivery were 39(93%). Majority 38(90%) were term deliveries and 25(60%) of mothers attended only one or no antenatal visits. The mean maternal age was 24.7 years with a range of 15 to 44 years. Most of the neonates with congenital anomalies 27(64.3%) were born to mother between 15 and 34 years. There were 16(38%) mothers to neonates with congenital anomalies that were treated for genitourinary symptoms during pregnancy and 10(23%) who were treated for febrile illnesses. At least 6(14%) had received some over the counter drugs during pregnancy.
Conclusion: The prevalence of congenital anomalies was relatively low. Abdominal wall defects and tube defect were the commonest gross congenital anomalies found. Majority of mothers to neonates with gross congenital anomaly did not attend antenatal care as expected. Encouraging antenatal care amongst pregnant woman may help to improve outcomes.

Keywords— Anomaly, Antenatal, Congenital, Defects, Maternal, Neonates, Pregnancy

1 Introduction

Congenital anomalies are a global problem and every year an estimated 7.9 million children are born with a serious birth defect, 3.3 million children under five years of age die from birth defects, and 3.2 million who survive may be disabled for life (6).

Congenital anomalies are a major cause of perinatal and neonatal death, both in developed and developing countries (17).

The actual prevalence of congenital anomalies in Africa may be different from the developed world due to differences in genetics and differences in exposures such as infections, underreporting, deficiencies in diagnostic capabilities, and poor follow-up for examination for anomalies in the postnatal period (8).

Congenital anomalies are developmental disorders present at birth. The prevalence and pattern of congenital anomalies varies between regions and may also vary over time. The most common body systems involved in congenital anomalies include musculoskeletal, central nervous system, gastro intestinal system and cardiovascular system with the least affected system being the urogenital system (7).

Despite the frequency of congenital anomalies, the underlying causes for most remain obscure. It has been estimated that around 15%-25% are due to recognized genetic conditions (chromosome and single gene causes), 8%-12% are due to environmental factors (maternal-related conditions, drug or chemical exposures) and 20%-25% are due to multifactorial inheritance [8]. The majority, 40%-60% of congenital anomalies have unexplained causes (10).

Environmental factors such as air pollution and proximity to hazardous waste sites have recently been reported to increase risk of structural birth defects and chromosomal abnormalities (11). Other physical environmental factors such as, drugs, infections from the mother and maternal pesticide exposure have also been implicated [5]. Treatment and rehabilitation of children with congenital malformation is costly and complete recovery is usually impossible (13).

Although it has been reported that out of the approximately 350,000 children born in Canada each year, most are born healthy and at term, about 2-3% of these babies present with serious congenital anomalies (10).

2 Objective of the Study

However, un-published data from neonatal unit at JFK medical center revealed an upward trend of congenital anomalies. This study was therefore conducted to review

the cases of congenital anomalies delivered and referred to JFK medical center to ascertain the prevalence.

3 Methodology

3.1 Study location

This Study was conducted at the John F. Kennedy Medical Center Neonatal Unit of Department of Pediatrics. JFK Medical Center is the Premier referral hospital situated in Monrovia, Liberia. The Hospital renders care to about one million Liberians both from Monrovia and the peripheral counties.

3.2 Study type and population

This is a retrospective study conducted at JFK medical center, covering the period between January 2015 to June 30, 2016. All neonates delivered at JFK Medical center with gross congenital anomalies, or referred to JFK from other health facilities within Liberia were included into the study. Neonates with only internal congenital anomalies were excluded since we could not perform imaging to all neonates suspected with internal anomalies. Charts belonging to neonates with gross congenital anomalies were retrieved and reviewed for the following variables: age, gender, place of delivery, type of delivery, and the diagnosis of anomaly. These charts were similarly reviewed for maternal information including age, antenatal attendance, gestational age, history of maternal infection and drug use.

3.3 Data analysis

The data was analyzed using Microsoft Excel 2016. Frequency tables, Pie Charts and Bar charts were used to represent the variables

3.4 Ethical Clearance

This research proposal was first presented to the ethical review board of the Department of Surgery for ethical clearance.

4 Results

Over the eighteen-month period from January 2015 to June 2016, there was a total of 2037 neonates admitted to the Neonatal Unit at JFK Medical Center including in-born and those referred from other facilities. There was total of 42 cases of congenital anomalies giving a prevalence rate of 2.1%.

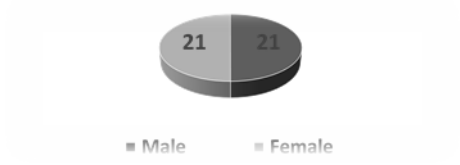

Fig. 1. The study showed a 1:1 male to female ratio.

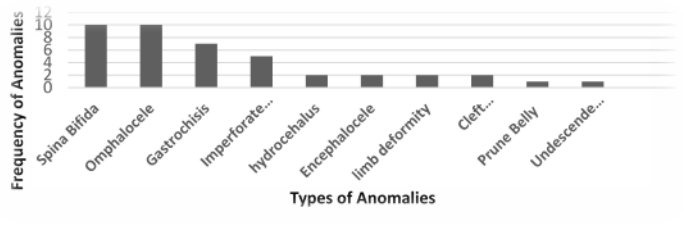

Fig. 2. Neural tube defect 10/42 (24%) and Omphalocele 10/42 (24%) accounted for most of the anomalies.

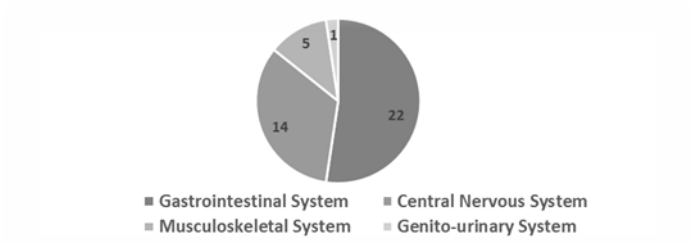

Fig. 3. The gastrointestinal system was the most affected 22/42 (50%) with genitourinary constituting the least 2%.

Fig. 4. The study displayed that most cases of congenital anomalies were delivered at home 17/42 (40%).

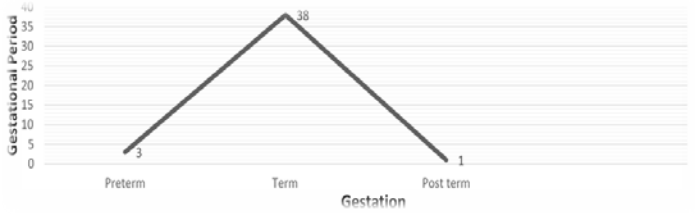

Fig. 5. Most neonates with congenital anomalies were product of term deliveries 38/42 (90%).

Fig. 6. 93% of these neonates with anomalies were products of vaginal delivery.

Fig. 7. About 60% of these mothers had one or no antenatal visits.

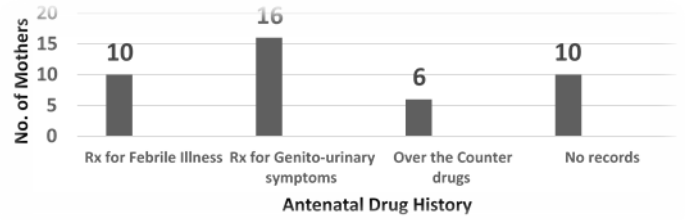

Fig. 8. The study showed that 38% of the mothers were treated for genitourinary symptoms while 23% were treated for febrile illness sometime during pregnancy. At least 14% received some over the counter drugs.

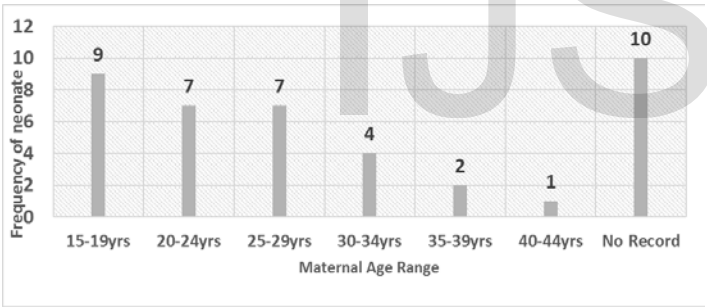

Fig. 1. The mean maternal age was 24.7 years with the lowest age at 15 years and the oldest at 44 years. Most of the neonates with congenital anomalies 64.3% were born to mothers between 15 years to 34 years with the highest range in teenage mothers (21%).

4 Discussion

The prevalence of congenital anomalies of 2.1% obtained in this study was comparable to the findings by Anankpa BO et al (16) and Obu et al (18). The fact that these studies were done in referral institutions where major congenital defects are admitted may offer some explanation for the observed similarities. There was no difference in the male to female ratio and this finding concurred with other study including Ndibazza et al (8) and Obu et al (18).

Neural tube defect and omphalocele were the commonest anomalies in the study which was similar to Ekwere et al (10) which described neural tube defect and omphalocele as the commonest of the central nervous system and gastrointestinal system respectively. The lack of proper antenatal screening and folic supplementation could explain the high occurrence rate.

The gastrointestinal system was the most affected system when omphalocele and gastrochisis were combined followed by the central nervous which was concurrent with Ekwere et al (10) in Jos Teaching Hospital Nigeria. Nevertheless, this contrasts with most other studies including Eluwa et al (19) revealed that the central nervous system and the musculoskeletal system were the most affected systems. These variances in the distribution of prevalence could result from the paucity of investigatory modalities such as karyotyping, autopsy as well as exposure to different risk factors across settings.

Majority of the anomalies in the study were term vaginal delivery with the most delivered at home. There is a tendency amongst African mothers to rely more on traditional birth attendants rather than seeking hospital care following the challenge most of these women face assessing health care. The inadequate antenatal care attendance about 60% amongst mothers in this research could depict the prevalence of neural tube defect as folic supplementation and other prenatal vitamins might not have been administered especially during the first trimester. This finding was consistent with Anankpa BO et al (16) where mothers seen only in the third trimester, 61% had the highest number of babies with congenital anomalies.

Though the study showed that 38% of the mothers were treated for genitourinary symptoms, 23% for febrile illness while 14% received some over the counter drugs, the data was not clear on the types of illnesses, at what gestation, and specific medication received. Notwithstanding, pre-pregnancy immunization against rubella, and interventions to reduce alcohol and drug use in pregnancy are associated with better outcome (10).

Most of the neonates with congenital anomalies (64.3%) were born to mothers between 15 years to 34 years with the highest range in teenage mothers (21%). This finding correlates well with Mkandawire et al (21) as most of the congenital anomalies of newborns were associated with teenage mothers, especially neural tube defect. Many pregnant teenagers cannot assess antenatal care due to financial reasons and a large proportion of those who do so, would not afford the essential drugs. Similarly, some cultural practices prohibit pregnant women from eating certain meals and foods which contributes to malnutrition and poor maternal health (22).

5 Conclusion

The prevalence of congenital anomalies in the study was 2.1% with abdominal wall defect and neural tube defect being the commonest anomalies in the study. Antenatal care should be encouraged amongst pregnant women as the number of home deliveries with congenital anomalies was relatively high. Every effort should be made to record neonates with congenital anomalies as part of an effort to establish prevalence data. These efforts will outline the extent of the problem enhancing formulation of appropriate

prevention and management strategies.

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