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Prevalence of Congenital Anomalies among Babies born In IBN SINA TEACHING Hospital Sirte-Libya during 2024

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A B S T R A C T

Congenital anomalies are a leading cause of infant morbidity and mortality. This study assessed their prevalence, classifications, associated risk factors, and clinical outcomes among neonates admitted to the Neonatal Intensive Care Unit (NICU) of Ibn Sina Teaching Hospital, Sirte Libya, all over 2024

Methodology: cross-sectional study conducted among neonates delivered at Ibn Sina Teaching Hospital Sirte-Libya from 1st January 2024 to 31 December 2024.

Data collected in special book prepared to include to newborns and maternal variables important in this research including gestational age maternal detailed obstetric history mother, consanguinity and another variable. **Result**: Among 53 infants with congenital anomalies, the mortality rate was 22.64%. The most common anomalies were syndromic including trisomy 21, trisomy18, followed by gastrointestinal anomalies. **Conclusion**: Congenital anomalies impose a considerable burden on neonatal health in this population. Risk factors identified included consanguinity, maternal ages, and specific maternal conditions. These findings emphasize the need for evidence-based, targeted interventions to enhance maternal and neonatal outcomes.

1 Introduction

Human development is a continuous process that starts when a sperm fertilizes an ovum, through processes like cell growth, division, differentiation, and even cell death, the fertilized ovum develops into a multicellular human, during early pregnancy, each organ undergoes a crucial phase called organogenesis. Disruptions from internal or external factors during this period can result in various types of birth defects. Congenital anomalies (CAs), commonly referred to as birth defects, are defined as structural or functional abnormalities that may be detected during pregnancy or become apparent at birth or later in life. These include both visible and microscopic malformations, metabolic disorders, intellectual disabilities, and abnormalities at the cellular and molecular level.1

Major abnormalities may be life threatening or have the potential to result in a tremendous physical, financial, and emotional burden on the affected families2

Multiple surveys have attempted to assess the global prevalence of congenital anomalies, which differs significantly among various populations. In England, the rate is approximately 2%, while in the United States, it ranges from 2% to 3% and in India, and it is about 3.65%, it estimated that congenital anomalies account for around 20% to 30% of infant deaths. 3

Birth defects significantly affect both fetuses and newborns, accounting for 495,000 deaths globally. Most of these fatalities occur within the first year of life, making them a major factor in the infant mortality rate. 4

2 Aim of the Study

This study aims to evaluate the prevalence and characteristics of congenital malformations (CMs) in infants born at IBN SINA Teaching Hospital throughout 2024.

3 Methods and Material

An institutional based- cross-sectional study conducted among neonates delivered at Ibn Sina Teaching Hospital Sirte-Libya from 1st January 2024 to 31 December 2024.

Data collected in special book prepared to include to newborns and maternal variables important in this research including gestational age maternal detailed obstetric history mother, consanguinity and another variable.

4 Inclusion Criteria

All newborns with major or minor overt birth defect delivered in obstetric department in ibn Sina teaching hospital regardless the gestational age, either diagnosed ante or post Nataly involved in this research.

5 Exclusion Criteria

Those delivered outside ibn Sina teaching hospital and referred to hospital whether from privet or public hospital.

Ethical Consideration

Official consent taken from the head of the scientific committee and head of medical services office at Ibn Sina Teaching Hospital, confidentiality of data guaranteed.

Statistical analysis

Statistical analysis of study results was performed by the application of the statistical package social science software version 22 (SPSS). Data collected, analyzed, and expressed as frequency distributions and then computed in percentages in tables and figures.

Result

Over the course of the study, 3792 newborns delivered in IBN SINA teaching hospital, 53 (1.39%) diagnosed with congenital anomalies were admitted to the NICU. **Figure (1)** show percentage of congenital anomalies.

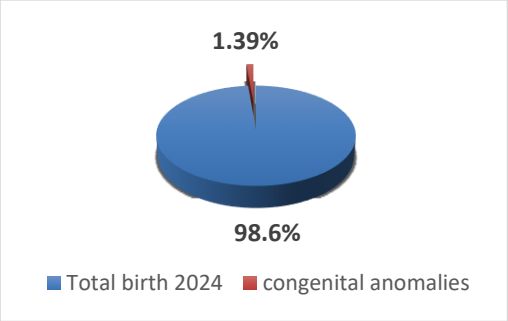

Figure (1)

Thirt y-six (67.92%) born by Cesarian Section, seventeen (32.05%) produced by vaginal delivery, mortality rate among these patients was 22.64% (12 infants). Admissions were disproportionately clustered in the first half of the study period (January–June), accounting for 62.26% (33 cases). **Figure (2)** show percentage of normal delivery to cesarian section.

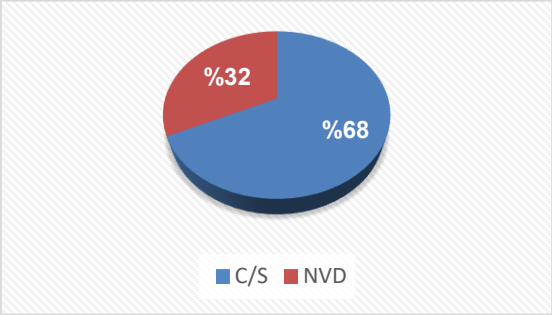

Figure (2)

In the present study, the distribution of congenital anomalies among the admitted neonates revealed a variable pattern across different systems. Syndromic cases accounted for 14 instances (26.4%), representing the largest proportion within the cohort. This was followed by gastrointestinal anomalies with 11 cases (20.8%) and extremity anomalies with 10 cases (18.9%). Genitourinary tract malformations and nervous system malformations were observed in 8 cases each (15.1%). This ranking highlights syndromic and gastrointestinal anomalies as the most frequent, while genitourinary and nervous system anomalies were the least common. The overall distribution underscores the heterogeneity of congenital malformations and emphasizes the importance of multidisciplinary approaches in diagnosis and management. **Figure (3)** showing distribution of congenital anomalies.

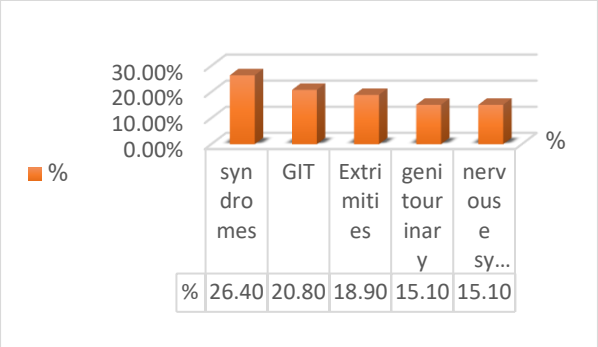

Figure (3)

Out of the total 53 neonates diagnosed with congenital anomalies, 26 cases (49.1%) were found to have a positive degree of consanguinity between parents. As show in **Table (1)**

Consanguinity	Number	%
Positive	26	**%49.1**
Negative	27	**%50.9**

Table (1)

Analysis of maternal age among the 53 neonates with congenital anomalies showed that 8 mothers (15.1%) were aged 20–25 years, 10 mothers (18.9%) were between 25–30 years, 15 mothers (28.3%) were in the age group 30–35 years, 14 mothers (26.4%) were aged 35–40 years, and 6 mothers (11.3%) were between 40–45 years as show in **Figure (4).**

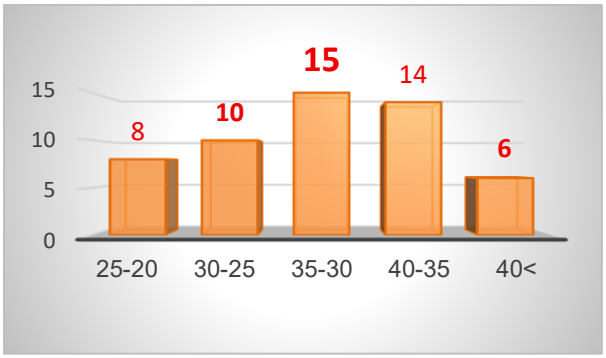

Figure (4)

Discussion

Congenital anomalies represent a significant cause of morbidity and mortality during early life. This study was conducted to evaluate their prevalence, associated risk factors, and clinical outcomes at Ibn Sina Teaching Hospital, among 3,792 live births in our hospital, 53 cases (1%) presented with congenital anomalies. This prevalence is lower than that reported in the Northeastern region of Cairo, Egypt, where the incidence of major malformations has been estimated at 2–3% of all live births.3

Unlike the Indian data, where central nervous system anomalies account for about 44% of cases, our findings revealed that syndromic (26.4%) and gastrointestinal anomalies (20.80%) were most common, whereas genitourinary and nervous system anomalies occurred less frequently.5

This study supports the Bradford (UK) findings that consanguinity is a significant risk factor for congenital anomalies, independent of socioeconomic status.6

A meta-analysis and systematic review, including 15 cohort, 14 case–control, and 36 cross-sectional studies, supports our findings that the prevalence of congenital anomalies—especially those caused by chromosomal defects—is directly associated with **maternal age.7**

Conclusion

Congenital anomalies in infants are strongly associated with neonatal morbidity and mortality. Among NICU admissions, they account for a substantial proportion and contribute to both immediate and long-term complications, frequently influenced by maternal health and antenatal factors. In this context, congenital anomalies place a significant burden on neonatal care. Consanguinity, maternal ages, and certain maternal conditions emerged as major risk factors. These findings underscore the need for targeted maternal and neonatal interventions to improve health outcomes

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Enclose the references list at the end of the manuscript accordingly to the APA (American Psychological Association) style (5th to 7th) edition.

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