



STUDY OF PATTERN, RISK FACTORS AND EARLY OUTCOME OF CONGENITAL ANOMALIES AMONG NEONATES IN TERTIARY LEVEL CARE CENTRE IN CENTRAL INDIA

Neonatology

Dr Aayushi Agrawal

Postgraduate Resident Department of Paediatrics, Mahatma Gandhi Memorial Medical College and Maharaja Yashwantrao Hospital, Indore, Madhya Pradesh, India

Dr Manju Biswas

Associate Professor Department of Paediatrics, Mahatma Gandhi Memorial Medical College and Maharaja Yashwantrao Hospital, Indore, Madhya Pradesh, India

Dr Monica Choudhary*

Assistant Professor, Department of Paediatrics, Mahatma Gandhi Memorial Medical College and Maharaja Yashwantrao Hospital, Indore, Madhya Pradesh, India
*Corresponding Author

ABSTRACT

Background- Congenital anomalies have a high morbidity and mortality rate. There is a scarcity of systematic published data from India on the incidence and spectrum of congenital abnormalities. **Objective-** To determine the incidence, spectrum and early outcome of congenital abnormalities at a tertiary hospital in central India over the period of a year. **Study Design-** Cross sectional observational study conducted at tertiary care hospital MGM Medical College, Indore Madhya Pradesh over the period of 12 months. **Subjects-** All newborns with congenital anomalies born in our labour room from August 2021 to July 2022. **Results-** In the study period, there were 10550 live births, of which 140 neonates had a congenital anomaly. The overall incidence of anomalies was 1.3%. Malformation of the cardiovascular system was the most common (31.4%) followed by GI system (24.2%) and central nervous system (12.1%). Mortality among new born with Congenital anomaly was 24.43% in which predominant system was cardiovascular. Treatable at our centre were 30.6% and 13.5% had to be referred to higher centre (maximum from cardiovascular system) from our tertiary level care centre. **Conclusion-** Our findings revealed a low incidence of congenital defects but significant mortality, highlighting the need for the RBSK programme and birth defect services to be strengthened. A distinct national database is required to understand the entire burden and spectrum of congenital abnormalities in the country.

KEYWORDS

Congenital Anomalies, Malformation, Sub-categorization

INTRODUCTION

The Ministry of Health and Family Welfare's National Rural Health Mission's "Child Health Screening and Early Intervention Services," also known as **Rashtriya Bal Swasthya Karyakram**, was introduced with aim of early detection and management of the 4Ds prevalent in children.

Congenital anomalies were listed as one of the top ten causes of death in children under the age of five in the Global Burden of Disease study from 2013 [1,2]. With the proper management of intrapartum-related complications, premature births, low birth weight infants, and infections brought on by such services, the contribution of congenital anomalies to neonatal deaths would rise. Data on the prevalence and types of congenital anomalies, as well as the proportion of mortality attributable to congenital anomalies are needed because of the possibility of a shift in the causes of mortality in urban areas of country like India. The number of live births with birth defects is not well documented. Also, there is still a lack of information regarding the medical requirements for infants with congenital anomalies. Furthermore, data are required to determine the most effective ways to set up surveillance for congenital anomalies as it is necessary to understand congenital anomalies, its types and their impact on healthcare and neonatal health, for the management of children born with specific birth defects.

AIMS AND OBJECTIVES-

Broad Objective :- To determine the pattern and risk factor of congenital anomalies at birth.

Specific Objectives :- To determine the early outcomes of congenital anomalies at birth at tertiary level care centre in central India

MATERIALS AND METHODS

This study was a cross sectional observational study conducted over 1 year at department of paediatrics M. Y. H. and CNBC Hospital, Indore.

All births at our tertiary care hospital during the research period were included in our prospective analysis, as were infants with congenital anomalies. For uniformity and international comparability, the International Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10) was adopted. The WHO birth defect surveillance manual as used in government programme was used for further sub-categorization. The incidence of individual and overall congenital abnormalities was determined.

RESULTS

In our study of congenital anomalies, total live birth were 10550 during study periods. Out of 10550 live births, congenital anomalies were seen in 1.32% on the basis of clinical evaluation and laboratory examination. Total still birth were 450 out of which congenital anomaly were present in 18 patients i.e. 4.1% (**Table 1**). In our study, 86.5% of the babies i.e. 121 out of 140 cases were having single system defects. Of the total cases, 13.5% i.e. 19 out of 140 cases were having multi-system birth defects (**Table 2**). In our study, cardiovascular system was the most common congenital defect, accounting for 31.43% of all births (4.17/1000 live births), with the gastrointestinal system being the second common (24.29%). The central nervous system accounts for 12.14% of all births (1.61/1000 live births) followed by musculoskeletal system i.e. 10% (1.32/1000 live births) anomalies, followed by Urinary System Anomalies account for 8.57% (1.14/1000 live births), with multi-system involvement present in the remaining of instances. In the multi-system involvement, the most common was skeletal with cardiovascular system involvement (**Table 3**). In our study, the neonatal mortality rate was 25%. Most common system contributing to mortality was cardiovascular. We found that 22.86% babies were referred to pediatric surgery department of our hospital while 13.57% were referred to higher centre for further management among which most cases were of cardiovascular anomalies and 7.86% cases were sent to plastic surgery for corrective measures. In our study, 9.29% babies left the hospital against medical advice (**Table 4**). Only 12.86% of total congenital anomalies were detected through antenatal investigations which means only 18 out of total 140 mothers knew antenatally about the presence of congenital anomalies in their babies. Rest were detected postnatally through clinical and laboratory examinations (Figure 1).

DISCUSSION-

In the present study, 132 congenital abnormalities were discovered per 10,000 live births (1.32%). Bhide et al [3] reported the pooled prevalence of congenital abnormality affected infants as 184.48 per 10,000 births. Another Central Indian research by Taksande A et al [4] discovered a rate of 1.91% in 2010. In our study, 4.50 IUD/stillbirths occurred over the study period, with 18 of these being due to a birth defect. Congenital abnormality rate in still birth in our study was 4%, which was similar to the study done in 2013 by Jaikrishan G et al [5], who discovered that the still birth rate in Kerala was 4.35%. In another study from central India by Taksande A et al [4], 5.02% congenital anomaly rate was found in still birth.

In this study, eighty seven percent of newborns have a single birth abnormality, whereas fourteen percent have birth defects involving various organ systems.

In our study, cardiovascular system was the most common congenital defect, accounting for 31.43% of all births (4/1000 live births). According to a study by Saxena A et al [6], the rate of Cardiovascular system anomaly was 4.17/1000 live births. The rate of major congenital birth defects at birth was 8.07 per 1000 live births, which was more than double the rate seen in our study. Another meta-analysis published in 2016, found that congenital heart defects were the most common anomalies in their study (6.586 per 1000 births).

The results in our study show that the gastrointestinal system was the second common congenital anomaly (24.29%). In our study, the rate of gastro-intestinal system anomaly was 3.22/1000 live births, whereas a study by Bhide et al [3] in 2016 found the incidence to be a little less i.e. 2.195 per 1000 births.

The rate of central nervous system abnormality in our study was 1.61/1000 live births. According to Bhide et al [3] in 2016, the total incidence rate found was higher i.e. 2.744 per 1000 births, and the most common nervous system anomaly in their study was neural tube malformation while in our study it was hydrocephalous.

The rate of musculoskeletal abnormality in our study was 1.32/1000 live births, CTEV being the common presentation and polydactyly was second common. Similar results were found by Bhide et al. (2016). Urinary System Anomalies were 1.14/1000 live births in our study which is lower than the 3.842 per 1000 newborns reported by Bhide et al [3] in 2016.

We found that there was high mortality in children born with congenital anomaly. The neonatal mortality rate was 25%. Amongst this, cardiovascular system was the predominant cause. Overall, 22.86% babies were referred to paediatric surgery department of our hospital for early corrective surgeries while 13.57% were referred to higher centre for further management among which most cases were of cardiovascular anomalies. We sent 7.86% cases to plastic surgery for corrective measures and 9.29% babies left the hospital against medical advice.

We found in our study that only 12.86% of women were aware that their child had a congenital problem during the antenatal period, while 34.29% babies were diagnosed at birth after a clinical assessment, and the majority of mothers (52.86%) were informed about the presence of malformation through investigations post birth.

CONCLUSIONS

The outcomes of this study reveal that congenital abnormalities are significant conditions leading to major morbidities and mortality. Birth incidence rate in our country is similar to global rates. The findings of this study imply that in metropolitan regions, a change in the causes of neonatal mortality may be occurring, with upsurge in the cases of congenital malformations. More research is required to identify the factors responsible for different types of congenital anomalies. Though birth defects services containing components of care, prevention and surveillance in the form of RBSK are well running in the country, our data identifies that there is relative high frequencies of congenital anomalies which go undetected. And the general awareness in the population about their occurrence is also lacking. So, it's high time to strengthen programme catering to such issues.

Limitations

Due to time constraints only study period cases were included. Also pattern of anomalies differ according to geographical area, and as we could include participants of only this area we could not present widespread data on this issue.

Table No.1 - incidence of congenital anomalies

	Total Deliveries	Congenital Anomalies	Percentage
Live birth	10550	140	1.32%
IUD/still birth	450	18	4.1%

Table no. 2 Distribution of study participants according to Type of defect

Type of defect	Frequency	Percent
Single	121	87%

Multi-system	19	14%
Total	140	100%

Table no. 3 Distribution of study participants according to system involved and anomalies

System Involvement	Frequency	Percent
CVS	44	31.43%
GIT	34	24.29%
CNS	17	12.14%
musculoskeletal	14	10.00%
Renal	12	8.57%
Multi-system	19	13.50%
Total	140	100.00%

Table no 4- Distribution of study participants according to frequency of Outcome

OUTCOME	Frequency	Percent
Death	35	25.00%
Paediatrics surgery	32	22.86%
Discharge	30	21.43%
Referred to higher centre	19	13.57%
LAMA	13	9.29%
Plastic surgery	11	7.86%
Total	140	100.00%

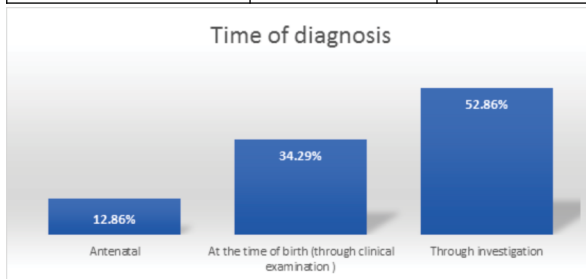


Figure no. 1 distribution of study participants according to their time of diagnosis

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