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Original Article

Paediatrics Section

Clinically Detectable Congenital Anomalies in Newborn Babies Admitted in Neonatal Intensive Care Unit at Teaching Hospital

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ABSTRACT

Introduction: Any structural and chromosomal malformations can leads to significant impact on overall growth and development of a child and are among the leading cause of morbidity and mortality in newborn.

Aim: To know the overall incidence of clinically detectable congenital anomaly and the types of different congenital anomaly in newborn at tertiary care hospital.

Materials and Methods: All the newborn admitted in newborn intensive care unit with clinical detected congenital malformation over a period of one year. Data were recorded from medical records of admitted newborns.

Results: During the study period total 9440 deliveries occurred in hospital; out of them 140 newborns were having clinically detectable malformations with Incidence of 3.6%. Mean birth weight was 2600±650 gm and mean gestational age was 36±2.8 weeks. Most common affected system was gastrointestinal (37.8%) followed by central nervous system (15%). Most common central nervous system malformations were neural tube defects. Congenital Talipus Equino Varus (CTEV) 10 (21%) was most common musculoskeletal malformation. Among all congenitally malformed patients; cleft lip and cleft palate 11 (7.8%) was most common congenital anomaly.

Conclusion: Birth defects services including components of care, prevention and surveillance in the form of a well defined programme are needed in the country.

Keywords: Cleft lip, Cleft palate, Malformations, Neural tube defect

INTRODUCTION

Congenital anomalies can be identified prenatally, at birth or later and they are structural or functional anomalies (e.g., metabolic disorders) that occur during intrauterine life [1]. Because of the poor diagnostic capabilities and lack of reliability of records; prevalence of congenital anomalies in developing countries is not estimated exactly. This results in more focus on overt acute illnesses recording, rather than on pre-existing congenital conditions.

Among thousands of congenital anomalies, some are treatable and curable and others are not treatable, leading to increase morbidity and mortality in the first year of life. Worldwide, congenital anomalies are responsible for death of around, 276,000 babies in neonatal period worldwide, from congenital anomalies [2]. Studies from India showed that congenital anomalies account for 8-15% of perinatal deaths and 13-16% of neonatal deaths [3,4].

All congenital anomalies are not lethal always but babies born with different types of non-fatal anomalies would survive with disability or they may require care for lifelong, leads to mental and financial burden on affected families [5]. There is plenty of data on the number of live born children with birth defects.

Etiology of congenital anomaly is unknown in about two third of the cases but there are studies that both genetic and environmental factor may play a role, indicating multifactorial nature of disease in about one-third of the cases. Numbers of environmental risk factors have shown to been associated with the occurrence of congenital anomalies [6].

There has been a increase in the rate of termination of pregnancy for foetal anomaly [7-8]. Studies have shown that use of folic acid before conception and other multivitamin supplementation significantly decrease the prevalence of some specific congenital malformations [9-11].

Changes over time and identification of etiology of congenital anomalies can be established by documenting and reporting of birth defects [2,12]. They are also important for health service planning and evaluating antenatal screening in population with high risk.

We had planned above study to document the incidence and types of various congenital malformations in newborn babies admitted at our tertiary care hospital.

MATERIALS AND METHODS

The study was carried out in Department of Paediatrics, Zanana hospital Jhalawar Medical College and associated Hospital, Jhalawar for a period of one year (March 2016 to February 2017). It was a cross-sectional retrospective study and data were collected from medical record of the admitted newborn. All the newborn admitted in newborn intensive care unit with clinically detectable congenital malformation were included in the study.

All the relevant data of admitted babies (clinical detectable cases) from the medical record was recorded in pretested proforma. Detailed information regarding maternal age, order of pregnancy, gestational age, sex, birth weight and consanguinity was recorded. Antenatal history like maternal illness, drug history, exposure to teratogens and complications of labour was recorded. All the births having congenital malformations were included in study and were analysed. Ethical approval for this study was taken from institute ethical committee.

STATISTICAL ANALYSIS

Data was entered into Microsoft excel 2010 data sheet and statistical analysis was performed by standard statistical methods.

RESULTS

Present study was a retrospective cross-sectional study conducted at Zanana Hospital in Department of Paediatrics over a period of 1 year.

During the study period total 9440 deliveries occurred in hospital; out of them 140 newborns were having clinically detectable malformations. Incidence of congenital malformations was found to be 3.6%. Out of 140 malformed newborn, 78 (55.7%) were male and 62 (44.2%) were female with a male:female ratio of 1.2:1. In present study out of all malformed patients, birth weight of 88 (62.8%) patients was more than 2.5 kg and 52 (37.1%) patients were low birth weight (less than 2.5 kg). Mean birth weight was 2600±650 gm.

Out of 140 patients, 78 (55.7%) were delivered before 37 complete week of gestation and 62 (44.2%) babies were delivered after 37 week. Mean gestational age was 36±2.8 weeks [Table/Fig-1].

Out of 140 congenital malformed newborns; 53 (37.8%) had gastrointestinal malformations, 21 (15%) had central nervous system malformations, 21 (15%) had musculoskeletal system malformations, 16 (11.4%) had cardiovascular system malformation, 7 (5%) had genitourinary system malformation and 5 (3.5%) had chromosomal disorders [Table/Fig-2]. Cleft lip and cleft palate was present in 11 patients and isolated cleft lip in nine cases.

Most common central nervous system malformations were neural tube defects among them meningomyeloceole 8 (38%) was most common followed by hydrocephalous 4 (19%) and meningocoele in 3 (14.2%) patients [Table/Fig-3].

CTEV 10 (21%) was most common musculoskeletal malformation followed by syndactyly 3 (14%) and polydactyly in 3 (14%) patients. Among all congenitally malformed patients; cleft lip and cleft palate 11 (7.8%) was most common congenital anomaly.

Parameters	n (%)
Sex	
Male	78 (55.7%)
female	62 (44.2%)
Birth weight	
<2.5 kg	52 (37.1%)
>2.5 kg	88 (62.8%)
Gestation	
<37 completed week	62 (44.2%)
>37 week	78 (55.7%)

[Table/Fig-1]: Sex, birth weight and gestation of malformed newborns.

S.No.	Affected System	n (%)
1	Gastrointestinal System	53 (37.85%)
2	Central Nervous System	21 (15%)
3	Musculoskeletal System	21 (15%)
4	Cardiovascular System	16 (11.4%)
5	Genitourinary System	7 (5%)
6	Chromosomal disorder	5 (3.5%)
	Total	140

[Table/Fig-2]: System wise distribution of congenital malformations.

DISCUSSION

There are changes in pattern and prevalence of congenital anomalies in different geographical area over the time. Some anomalies are result of interaction between known and unknown genetic and environmental factor. With improved neonatal care over the decades, congenital anomalies are important cause of perinatal mortality.

In our study, we tried to find out the types and individual incidence of congenital anomalies in our neonatal intensive care unit. The overall incidence of congenital malformation was 3.6% in present study. Sarkar S et al., and Francin R et al., in their study also reported prevalence of 2.22% and 2.4% respectively [13,14]. Ali A et al., Verma M et al., and Sawardekar KP et al., also reported similar incidence of congenital anomaly [15-17]. Taskade A et al., and Chaturvedi P et al., from India reported incidence of congenital anomaly in newborn 1.9% and 2.72% respectively [18,19]. The true incidence of congenital anomalies depends up on several factors and the therefore two studies are never comparable. In our study we have not included abortions

and still births otherwise the incidence would have been more than the present rate. Tertiary care center hospital mostly handles referred cases so this result could not be generalised.

S.NO.	Type of Anomaly	n (%)
Gastrointestinal System		
1	Cleft Lip and Cleft Palate	11
2	Tracheoesophageal Fistula	10
3	Cleft Palate alone	9
4	Cleft Lip alone	6
5	TEF and other anomalies	6
6	Imperforate anus	5
7	Anal atresia	2
8	Duodenal atresia	2
9	Intestinal obstruction	2
	Total	53 (37.85%)
Central Nervous System		
1	Meningomylocoele	8
2	Hydrocephalus	4
3	Meningocoele	2
4	Anencephaly	2
5	Spine Bifida	2
6	Hydrocephalus with Meningomylocoele	2
7	Encephalocoele	1
	Total	21 (15%)
Musculoskeletal System		
1	CTEV	10
2	Syndactly	3
3	Polydactyl	3
4	Skeletal Dysplasia	3
5	CTEV with Microcephaly	2
	Total	21 (15%)
Cardiovascular System		
1	Acyanotic Heart Diseases	10
2	Acyanotic Heart Diseases	6
	Total	16 (11.42%)
Genitourinary System		
1	Epispadias	2
2	Hypospadias	2
3	Ambiguous Genitalia	2
4	Metal Stenosis	1
	Total	7 (5%)
Chromosomal Disorder		
1	Down's Syndrome	3
2	Turner's Syndrome	2
	Total	5 (3.57%)

[Table/Fig-3]: Individual pattern of major congenital anomalies.

Because of advanced diagnostic facilities and availability of neonatal intensive care units, the chances of survival of congenitally malformed babies increased that leads to apparent increase incidence of birth defects. In present study it was found that incidence of congenital anomalies was much higher in preterm babies 78 (55.7%) as compare to term babies 62 (44.2%). Similar results was also found in other studies [13,20].

In present study congenital malformation of the gastrointestinal system 37.8% were the highest followed by central nervous system 15% and musculoskeletal system 15%. Study done by Sarkar et al., reported that musculoskeletal system anomalies was most common congenital anomaly(33.2%) followed by Gastrointestinal (GI) system (15%) [13]. Egbe A et al., studied 1,01426 newborn and found that most common affected system was cardiovascular followed by central nervous system and they also reported higher incidence in preterm babies [21]. Abdolahi HM et al., examined 22500 live birth among them 254 had congenital malformations. Central nervous system anomaly (24%) was most common followed by cardiovascular anomaly [22].

In present study, we documented that most common central nervous system malformations were neural tube defects. Mashuda K et al., in their study analysed data of 445 malformed patients and found that most common congenital anomaly in central nervous system was neural tube defect and this was significantly associated with lack of periconceptional use of folic acid [23]. Likewise, Bhide P et al., also reported neural tube defect as a most common anomaly in central nervous system [24].

In present study CTEV 10 (21%) was most common musculoskeletal malformation followed by syndactyly 14% and polydactyly in 14% patients. Pattanaik T et al., in their study examined 100 patients and found musculoskeletal system was second most common affected system in congenital anomaly and among that CTEV was present in majority of cases [25].

This difference in prevalence and pattern between studies might be the effect of different cultural, racial, ethnic and social factors in various parts of the country and also in world. On other hand variations in sampling, diagnostic criteria, recording of the data etc in studies can also results in variable results.

LIMITATION

Our study was hospital based study and number of newborn was also less so results cannot be generalised. We have also not included abortions and still birth. Complete data about out born newborn was not available like few newborn with lethal or minor anomalies may not be referred to our center from periphery.

CONCLUSION

Congenital anomalies are important cause of neonatal morbidity and mortality. Regular antenatal visits and prenatal diagnosis

by early trimester screening test are recommended for prevention, timely intervention and even planned termination. Periconceptional use of folic acid can prevent majority of neural tube defect. Birth defects services including components of care, prevention and surveillance in the form of a well defined programme are needed in the country.

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