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Prevalence of Congenital Malformations in Newborn and Associated Risk Factor

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Introduction

The Global Burden of Disease study 2013 identified congenital anomalies among the top ten causes of mortality in children less than five years of age [1]. According to the World Health Organization (WHO) document of 1972, the term congenital malformations should be confined to structural defects at birth. However, as per the more recent WHO fact-sheet of October 2012, congenital anomalies can be defined as structural or functional anomalies, including metabolic disorders, which are present at the time of birth.[2] Congenital anomalies are an important cause of neonatal mortality both in developed and developing countries. In 2010, congenital anomalies were estimated to be the fifth largest cause of neonatal deaths in India after preterm births (34.7%), intrapartum complications (19.6%), pneumonia (16.3%) and neonatal sepsis (15%) [3]. Despite this ranking, in absolute numbers, congenital anomalies were estimated to contribute to 60,699 neonatal deaths in India in 2013, which accounted for the highest global burden of neonatal mortality due to congenital anomalies (4).

Aims and Objectives

This study was undertaken to determine the prevalence and pattern of congenital anomalies in babies and to study the associated maternal and perinatal risk factors.

Materials and Methods

This prospective clinical study was carried out in the labour ward, Department of Obstetrics and Gynecology of Maharaja Agrasen Medical College, Agroha from July 2017 to December 2017. All the babies born with congenital anomalies during this period were included.

The newborns were examined and assessed systematically for the presence of congenital anomalies. Diagnosis of congenital anomalies was based on clinical evaluation of newborn babies by the gynecologists and pediatrician and other appropriate investigations such as radiography, ultrasonography, echocardiography etc. System wise distribution of the anomalies was performed. For each case, a detailed antenatal and maternal history including the age of the mothers, parity, history of consanguinity, previous similar history were obtained by reviewing the maternal and labour ward records and by interviewing the parents.

Birth weights >2.5 kg were considered to be normal; whereas, birth weights <2.5 kg and <1.5 kg were termed as low birth weight (LBW) and very low birth weight (VLBW) respectively. Babies born at <37 completed weeks (i.e., <259 days), calculated from the 1st day of last menstrual period, were considered as preterm.

Data was entered into excel data sheet and appropriate statistical analysis was performed.

Results

During the study period, 1110 newborns were born in our institution; of which 44 had congenital malformations, making the prevalence 3.9%. Among all the newborns, 2 babies were born of twin delivery. The congenital anomalies affected significantly higher proportion of male babies (5.2%) than their female counterparts (2.5%). Among total number of stillborn babies 25% had congenital malformations. The predominant system involved was central nervous system (CNS) (63.6%) mainly neural tube defect followed by cardiovascular system (18.2%) and gastrointestinal system (9.1%). According to our study majority of congenital malformation are associated with maternal age >35 years and parity greater than 3. 3/44 mothers (6.8%) had a history of previous abortions, 1/44 (2.3%) was diabetic mother and 2/44 (4.5%) had a history of congenital heart disease in previous child or malformed babies.

Discussion

Congenital anomalies are important causes of increasing mortality and morbidity among childhood. Their detection rate is improving even in antenatal period due to advanced diagnostic technology, especially USG. The incidence of congenital malformation in the present study was 3.9%, which is almost comparable with the earlier studies from the hospital, which reported an incidence of 2.72 and 1.24% subsequently.[5,6] This study revealed higher incidence of anomalies in stillbirths (25%). Association of low birth weight with increased risk of congenital malformations was very well documented.[7] Our finding is in accordance with this. The incidence of congenital anomalies was significantly higher in preterm babies as compared to full term babies.[8] Previous studies and our study also have reported male preponderance amongst congenital malformed babies. This study has statistically shown that mothers, above 30 years of age, stand at a higher risk of producing malformed babies. Sugunabai[9] reported a higher incidence of malformation in the babies born to mothers aged over 35 years, whereas Datta *et al*.[6] documented statistically insignificant association of increased maternal age and congenital anomalies. Previous studies have[7] reported that significantly higher incidence of malformation among the mothers of gravida 4 or more and our results are consistent with this finding. This indicates that as the birth order increases, the incidence of congenital anomalies also increases. The main aim of the study is to plan measures for maternal and child health, with a main focus on prevention of congenital malformations, by health education, adequate prenatal care and organization of referral networks for major anomalies.

Kalra *et al*.[10] reported that the CNS defects have the highest incidence, whereas Sugunabi *et al*.[9] reported gastrointestinal malformations to rank the highest. Mathur *et al*.[8] reported that the musculoskeletal abnormalities were the commonest. This study showed that CNS was the most commonly affected.

Conclusion

Congenital anomalies are a major cause of mortality and morbidity. By thorough clinical examination and

ultrasound, congenital malformation can be diagnosed earlier. Evaluation of cardiovascular system to rule out congenital heart disease in a high-risk mother's baby is the important factor to be considered.

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Legends Tables

Table 1

	Total Deliveries	Deliveries With Congenital Anomalies
	1110	44 (3.9%)
Male	532	28 (5.2%)
Female	577	15 (2.5%)
Undiagnosed	1	1
Liveborn	1086	36 (3.3%)
Stillborn	24	6 (25%)
Twin Deliveries	17	2 (11.7%)

Table 2

Systemwise Distribution Of Congenital Anomalies		
System	Number	Percentage
CNS (Central Nervous System)	28	63.6%
CVS (Cardiovascular System)	8	18.2%
GI (Gastrointestinal System)	4	9.1%
MSK (Musculoskeleton System)	2	4.5%
GUT (Genitourinary Tract System)	2	4.5%

Table 3

Gestation	Total deliveries	Congenitally malformed	percentage
Term	992	23	2.3%
Preterm	84	18	21.4%
Post term	34	3	8.82%

Table 4

Birth weight	Total deliveries	Congenitally malformed	Percentage
<1kg	12	3	25%
1-<1.5 kg	35	2	5.7%
1.5-<2kg	136	6	4.4%
2-<2.5kg	289	19	6.6%
>=2.5kg	638	14	2.2%

Table 5

Maternal age	Total delivery	Congenitally malformed	Percentage
<21 years	52	4	12.5%
21-25	746	21	2.8%
26-30	223	12	5.4%
31-35	72	3	4.2%
>35	17	4	23.5%

Table 6

Parity	Total delivery	Congenitally malformed	Percentage
Primi	387	11	2.8%
Para 1-3	656	25	3.8%
Para >3	67	8	11.9%