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Study of Prevalence and Spectrum of Congenital Anomalies in Muzaffarpur, Bihar: A Hospital Based Longitudinal Study

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Abstract
Objective: *Congenital anomalies are defined as structural or functional anomalies that occur during intrauterine life and can be identified antenatally, at birth or later in life. Congenital malformations are becoming increasingly important and are the leading cause of infant mortality and morbidity. Neonatal morbidity and mortality is a matter of great concern in our society in context of health care delivery system. The occurrence and pattern of presentation vary from region to region. The aim of present study was to determine the prevalence and types of congenital anomalies in newborns and to study the associated factors.*

Materials and Methods: *This longitudinal hospital based study was conducted in Department of Obstetrics and Gynecology, at S.K. Medical College and Hospital, Muzaffarpur, Bihar. Total 100 cases of congenital malformation, detected antenatally or after delivery, were analyzed within a study period of April 2016 to March 2017. All the relevant information's were collected by conducting an interview using a predesigned questionnaire. A thorough post-natal screening and examination was performed and anomalies were recorded.*

Result: *Total 100 cases of anomalies were studied out of 9060 pregnancies. The prevalence of congenital malformation was 1.10%. Most common age group with congenital anomalies were 20-30 years (63%). Most of the anomalous babies (74%) were born to multigravida mothers. Commonest system involved was central nervous system (44%). Maximum (60%) babies were diagnosed to have anomalies in the postpartum period. Amniotic fluid abnormalities were the most commonly (56%) associated maternal conditions. 63% of cases had history of absence of intake of peri conceptional folic acid intake.*

Conclusion: *Congenital anomalies are important causes of still births and infant mortality, and also contribute to childhood morbidity. The study helped to know the pattern of congenital anomalies and the presence of various associated factors. This study showed the need and importance of peri conceptional folic acid intake and significance of prenatal diagnosis through screening tests and targeted scans in first and second trimester as an important step to reduce its prevalence.*

Keywords: *Antenatal visit, congenital anomalies, prenatal diagnosis.*

Introduction

Congenital malformations are becoming increasingly important and are the leading cause of perinatal and neonatal mortality and chronic morbidity. Morbidity of post neonatal period and afterwards has a hazardous effect on building a capable nation in terms of development and better utilization of resources. Congenital disorders are defined as those diseases that are substantially determined before or during birth and which are in principle recognizable in early life".[1] The broad definition of congenital malformation includes not only anatomical defects but also molecular and cellular abnormalities present at birth.[2] Congenital anomalies (also referred as birth defects) affect approximately 1 in 33 infants and result in approximately 3.2 million birth-defects related disabilities every year.[3] An estimated 270,000 newborns die during the first 28 days of life every year from congenital anomalies.[3] Congenital anomalies may have a genetic, infectious or environmental origin; although in most of the cases it is difficult to identify their causes.[4] These contributes to 8-18% of perinatal mortality and morbidity and 10-15% of neonatal deaths.[5] Screening in first and second trimester is an important tool to reduce the incidence and prevalence. The birth prevalence of congenital anomalies in the developing countries is actually underestimated due to lack of diagnostic techniques and their reliability.[6]

Materials and Methods

It was a longitudinal hospital based study conducted in Department of Obstetrics and Gynecology S. K. Medical College and Hospital, Muzaffarpur, Bihar. Total 100 cases of congenital malformation detected antenatally or after delivery were analyzed. 9060 women were admitted for delivery during this period of study from April 2016 to March 2017. Those women who had diagnosed to have anomalous fetus either in antepartum period or after delivery who delivered in our hospital were included in study after informed consent. Those who delivered outside our hospital but admitted due to anomaly were excluded from this study. All the cases were clinically examined, evaluated and anomalies were confirmed. A thorough post natal screening and examination was also performed on all infants born. The demographic details recorded were gestational age at diagnosis of fetal anomaly, type of anomaly, commonest anomaly prevalent, etiological and risk factors if any, sex, were recorded. Detailed information regarding maternal age, order of pregnancy, gestational age, and consanguinity was documented. Antenatal history like maternal illness, ingestion of drugs, exposure to radiation and complications of labor was recorded. The screening for congenital malformation was done by antenatal ultrasound, blood tests, amniocentesis in selected cases. Al the new born babies were examined thoroughly by the pediatrician to detect the congenital malformation. If any internal congenital malformation were suspected further investigation like Ultrasonography, ECHO, X-ray etc., were done. All the data were recorded.

Result

Total 100 cases of anomaly were studied out of 9060 pregnancies. The prevalence of congenital malformation was 1.10%. Majority of antenatal women (63%) having anomalous foetus were in age group of 20-30 years followed by >30 years (19%), and <20 years (18%). Among all the births 58% were male, 40% were female and 2% babies had ambiguous genitalia. Most of the anomalous babies were born to multigravida women (74%), 26% of cases were among primigravida women. History of consanguinity among marriage was found in 7% of cases. [Table 1] 60% anomalies were diagnosed in the postpartum period i.e., after delivery and further visits, 26% anomalies were diagnosed during third trimester, 12% in second trimester and only 2% was diagnosed during first trimester [Table-2]. Polyhydramnios were found in 35% cases of anomalous babies, Oligohydramnios were found in 21% of cases, Maternal diabetes were found in 28% of cases and

maternal epilepsy in 17% of cases. History of absence of folic acid tablets were observed in 63% of cases, intake of drug in first trimester were observed in 11% of cases. Maternal history of previous adverse pregnancy outcome were found in 28% of cases. The pattern of congenital anomalies found included CNS(44%), Musculo-skeletal (13%), Genito-urinary tract(9%), CVS (7%), Gastrointestinal (7%), Face(5%), Respiratory (3%), Syndromes/Miscellaneous(7%) and others(4%).

Table1: Demographic distribution of anomalies

Maternal age	No of anomalous babies	Percentage
<20	18	18%
20-30	63	63%
>30	19	19%
Sex		
Male	58	58%
Female	40	40%
Ambigious	2	2%
Primigravida	26	26%
Multigravida	74	74%
Consanguinity	7	7%

Table-2: Time of detection of anomaly

Trimesters	Total cases(n=100)	Percentage (%)
1" trimester	2	2%
2" trimester	12	12%
3" trimester	26	26%
After delivery	60	60%

Table-3: Maternal conditions

Maternal conditions	No of cases	Percentage (%)
Presence of Polyhydramnios	35	35%
Presence of Oligohydramnios	21	21%
Presence of Mternal Diabetes	28	28%
Presence of Maternal Epilepsy	17	17%
Absence of periconceptional folic acid intake	63	63%
Presence of drug intake in first trimester	11	
Presence of maternal history of previous adverse pregnancy outcome	28	28%

Table 4 Type of abnormalities (Organ system involved)

Type of abnormality	No of cases	Percentage (%)
CNS Anencephaly, Hydrocephalus, Meningomyelocele, NTD with multiple defects , others	44	44%
Musculo-skeletal CTEV, Polydactyly, OI ,Achondroplasia, Micromelia, Arthogryposis, others	14	14%
Genitourinary tract Hyderonephrosis, Renal agenesis, PUJ obstruction,	9	9%
CVS ASD, VSD, PDA, TOF, TGV others	7	7%

Gastrointestinal Meconium ileus, Duodenal atresia, Malrotation of gut, Anorectal anomalies, Omphalocele, others	7	7%
Face Cleft lip/palate, Facial dysmorphism, others	5	5%
Respiratory system Bronchopulmonary dysplasia, CDH and others	3	3%
Syndromes/Miscellaneous	7	7%
Others Hypospadias, Micropenis, single umbilical artery, others	4	4%

Discussion

Congenital malformation is an important cause for neonatal morbidity and mortality. It accounts for 8-18% of perinatal mortality and the third most important factor in perinatal mortality next to birth asphyxia and prematurity. This study was an attempt to find out the most common system affected and to find out the presence of other factors that are likely to be associated with congenital anomalies. The prevalence of congenital abnormalities was 1.1% in this study. This was near to the findings of Amar Taksande.[7] Our study, revealed that a majority of malformed babies were born of mothers aged 20-30 years. Studies also shown that higher incidence of congenital malformations in age groups of 20-35 years.[8-9] 58% of cases were male. 74% of cases belonged to multigravida mothers. Previous studies have also reported significantly higher incidence of malformation among multiparous women.[7,10] In our study total 7% cases had consanguineous marriage. Like previous studies our study also showed a higher incidence of congenital malformation in parents having consanguineous marriage.[11-12] Out of 100 cases, 60 cases were detected after delivery. This was more likely due to poor rate of antenatal visits and screening. With regards to the associated conditions along with congenital malformation, abnormalities of amniotic fluid volume accounted for 56% of cases. 28% of cases had history of maternal diabetes and 17% showed history maternal epilepsy. Ordonez et al., showed positive association of diabetes mellitus, hypertension, and hypothyroidism with congenital

malformation.[13] Studies shown that women with uncontrolled diabetes have a 2-3 times higher risk of babies having congenital anomaly. [14-15] 63% of cases had history of absence of intake of periconceptional folic acid intake in our study. Studies have shown that intake of folic acid decreases the chances of these anomalies. [16-17] in our study 28% of cases had maternal history of adverse previous pregnancy outcome. A significant relationship between history of abortion in earlier pregnancy and congenital anomaly was found by Bhat BV.[18] With regard to pattern of congenital anomalies in the study, the most common system involved was CNS (44%), followed by musculo-skeletal system (14%), genitourinary (9%). cardiovascular system (7%) etc. Kalra et al., also reported that the CNS defects had the highest incidence.[19] In our study, anencephaly were the commonest malformation in CNS similar to the findings of Hall j. et al.[20] CTEV was the commonest malformation in the musculoskeletal system in our study.

Conclusion

The very problem of fetal handicapness is a matter of concern not only to the obstetrician, pediatricians or the couple themselves, but is a major burden on the society. Parents are also likely to be anxious and feel guilt on learning of the existence of a congenital anomaly and require sensitive counseling. Parents of any surviving anomalous child should receive emotional and financial support and assurance. This study has focused on the prevalence and types of congenital anomalies seen in our region. Congenital

malformation, one of the important causes of infant mortality and morbidity can be reduced by prenatal and antenatal screening and diagnosis through evaluation of maternal serum markers and USG. Regular antenatal visits and prenatal diagnosis by early trimester screening test and intake of folic acid tablets are recommended for the prevention, so that timely intervention and planned termination can be done in needful cases. Others measures that can be of importance are to discourage further reproduction after the birth of a malformed child through proper counseling, to avoid pregnancy in circumstances where malformations are more likely to occur(Down syndrome) and to avoid strictly those drugs that are contraindicated during pregnancy. Life threatening congenital malformations should be diagnosed as early as possible so that surgical correction or palliation may offer the better chances of survival. It would be better to pay attention to environmental factors for the prevention of malformations. Proper ante-natal checkups for better management of maternal conditions and adequate counseling regarding outcomes in case if any anomaly detected will definitely reduce the prevalence of congenital anomalies.

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