Original Research Article

Study of congenital malformations and related maternal and foetal factors: Hospital based study

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Abstract

Background: Congenital malformation represents defects in morphogenesis during early fetal life. According to the World Health Organization (WHO) document of 1972. **Aims and Objectives:** To Study of Congenital Malformations and related Maternal and Foetal Factors: Hospital Based Study **Methodology :** This was a cross sectional study carried out at the Paediatric department of the tertiary health care center during one year period from January 2015 to December 2015. All the 5607 newborns at the tertiary health care centre were screened for congenital malformation clinically and history of mothers like Iron Folic acid Consumption, Consanguinity, Maternal age, Fever with Rash, TORCH infection, Exposure to Smoking, Family history were asked. **Result:** The incidence of malformation was highest in the Age group >31 i.e. 4.26%and above age group followed by 15-20 1.21%; 26-30-0.81%; 21-25-0.43%and overall the incidence was observed to be 1.30%.The majority of the Associated Maternal Factors found were Age more than 31 Yrs. -53.42%; Inadequate IFA Supplementation -34.24%; H/o Fever with Rash -26.02%;H/o TORCH infection -20.54% H/o Exposure to Smoking -17.80%;Family history -16.43%;Consanguineous marriage -13.69%. The fetal factors associated with the Malformations were Male gender i.e. 63.01% followed by Low birth weight 61.64% ; Twins -20.54%; Birth order >4 -19.17%. **Conclusion:** In our study we have observed Maternal Factors associated were Age more than 31 Yrs. Inadequate IFA Supplementation; H/o Fever with Rash ;H/o TORCH infection-;H/o Exposure to Smoking; Family history ;Consanguineous marriage; The fetal factors associated with the Malformations were Male gender i.e. 63.01% followed by Low birth weight; Twins ; Birth order >4.

Key Words: Congenital Malformations, Maternal and Foetal Factors, IFA Supplementation TORCH infection, Fever with Rash.

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INTRODUCTION

Congenital malformation represents defects in morphogenesis during early fetal life. According to the World Health Organization (WHO) document of 1972, the term congenital malformations should be confined to structural defects at birth.[1] The leading causes of infant morbidity and mortality in poorer countries are malnutrition and infections, whereas in developed countries they are cancer, accidents and congenital malformations. Congenital anomalies account for 8–15% of perinatal deaths and 13–16% of neonatal deaths in India.[2,3] Patients with multiple congenital anomalies present a relatively infrequent but tremendously difficult challenge to the pediatrician. The proportion of perinatal deaths due to congenital malformations is increasing as a result of reduction of mortality due to other causes owing to the improvement in perinatal and neonatal care. As per WHO Congenital anomalies are also known as birth defects, congenital disorders or congenital malformations. Congenital anomalies can be defined as structural or functional anomalies (e.g. metabolic disorders) that occur during intrauterine life and can be identified prenatally, at

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birth or later in life. Causes and risk factors. Although approximately 50% of all congenital anomalies cannot be linked to a specific cause, there are some known causes or risk factors. Socioeconomic and demographic factors: Although low income may be an indirect determinant, congenital anomalies are more frequent among resource-constrained families and countries. It is estimated that about 94% of severe congenital anomalies occur in low- and middle-income countries, where women often lack access to sufficient, nutritious food and may have increased exposure to agents or factors such as infection and alcohol that induce or increase the incidence of abnormal prenatal development. Further, advanced maternal age increases the risk of chromosomal abnormalities, including Down syndrome, while young maternal age increases the risk of some congenital anomalies. Genetic factors: Consanguinity (when parents are related by blood) increases the prevalence of rare genetic congenital anomalies and nearly doubles the risk for neonatal and childhood death, intellectual disability and other anomalies in first-cousin unions. Some ethnic communities (e.g. Ashkenazi Jews or Finns) have a comparatively high prevalence of rare genetic mutations, leading to a higher risk of congenital anomalies.

Infections: Maternal infections such as syphilis and rubella are a significant cause of congenital anomalies in low- and middle-income countries.

Maternal nutritional status: Iodine deficiency, folate insufficiency, obesity and diabetes mellitus are linked to some congenital anomalies. For example, folate insufficiency increases the risk of having a baby with a neural tube defect. Also, excessive vitamin A intake may affect the normal development of an embryo or fetus.

Environmental factors: Maternal exposure to certain pesticides and other chemicals, as well as certain medications, alcohol, tobacco, psychoactive drugs and radiation during pregnancy, may increase the risk of having a fetus or neonate affected by congenital anomalies. Working or living near, or in, waste sites, smelters or mines may also be a risk factor, especially if the mother is exposed to other environmental risk factors or nutritional deficiencies4.

MATERIAL AND METHODS

This was a cross sectional study carried out at the Paediatric department of the tertiary health care center during one year period from January 2015 to December 2015. All the 5607new bornsat the tertiary health care center were screened for congenital malformation clinically and history of mothers like Iron Folic acid Consumption, Consanguinity, Maternal age, Fever with Rash, TORCH infection, Exposure to Smoking, Family history were asked.

RESULT

Table 1: Maternal age and congenital malformations

Group Maternal age (years)	Total no. of newborns	Babies with malformation	Incidence of Malformation (%)
15-20	1234	15	1.21%
21-25	2345	10	0.43%
26-30	1113	9	0.81%
31 and above	915	39	4.26%
Total	**5607**	**73**	**1.30%**

The incidence of malformation was highest in the 31 i.e. 4.26%and above age group followed by 15-201.21%; 26-30-0.81%; 21-25-0.43% and overall the incidence was observed to be 1.30%

Table 2: Distribution of Patients as per the Associated Maternal Factors

Maternal Factors	No.(n=73)	Percentage (%)
Age more than 31 Yrs.	39	53.42%
Inadequate IFA Supplementation	25	34.24%
H/oFever with Rash	19	26.02%
H/o TORCH infection	15	20.54%
H/o Exposure to Smoking	13	17.80%
Family history	12	16.43%
Consanguineous marriage	10	13.69%

The majority of the Associated Maternal Factors found were Age more than 31 Yrs. -53.42%; Inadequate IFA Supplementation -34.24%; H/o Fever with Rash -26.02%; H/o TORCH infection -20.54% H/o Exposure to Smoking -17.80%; Family history -16.43%; Consanguineous marriage -13.69%

Table 3: Distribution of Patients as per the Associate Fetal factors

Fetal factors	No.	Percentage (%)
Male	46	63.01%
Birth Weight < 2500	45	61.64%
Twins	15	20.54%
Birth order >4	14	19.17%

The fetal factors associated with the Malformations were Male gender i.e. 63.01% followed by Low birth weight 61.64%; Twins -20.54%; Birth order >4 -19.17%.

DISCUSSION

In our study the incidence of malformation was highest in the 31 i.e. 4.26%and above age group followed by 15-20 1.21%; 26-30-0.81%; 21-25-0.43%and overall the incidence was observed to be 1.30%, similarly Taksande *et al* have studied incidence of congenital anomalies and the associated risk factors at a rural medical college hospital in central Maharashtra and reported that maternal age of above 30 years had highest incidence of congenital malformations.6 Grover N study on congenital malformations in Shimla reported that maternal age of

above 35 years had highest incidence of congenital malformations.[11] Chaturvedi *et al* studied epidemiology of congenital malformations in 3000 consecutively delivered newborns and found no significant difference in the frequency of congenital malformation in different religion and caste subjects.[12] Also we found that The majority of the Associated Maternal Factors found were Age more than 31 Yrs. -53.42%; Inadequate IFA Supplementation -34.24%; H/o Fever with Rash -26.02%; H/o TORCH infection -20.54% H/o Exposure to Smoking -17.80%;Family history -16.43%; Consanguineous marriage -13.69% and The fetal factors associated with the Malformations were Male gender i.e. 63.01% followed by Low birth weight 61.64% ; Twins -20.54%; Birth order >4 -19.17%. Chaturvedi *et al* have reported higher incidence of congenital malformations in primigravida and fourth gravida mothers.8 In addition, Taksande *et al* have reported highest incidence of congenital malformations in mothers with parity 4 or more.[10] Many authors like Verma M *et al*, Taksande *et al*, Grover N, Saifullah *et al* made similar observations.[5,10,11,13] Incidence of congenital malformations was more in preterm babies as compared to full term babies and the difference was statistically significant. Verma M *et al*, Taksande *et al* have also found that prematurity has a higher risk of congenital anomalies.[5-10]

CONCLUSION

In our study we have observed Maternal Factors associated were Age more than 31 Yrs. Inadequate IFA Supplementation; H/o Fever with Rash ;H/o TORCH infection -;H/o Exposure to Smoking ;Family history ;Consanguineous marriage ;The fetal factors associated with the Malformations were Male gender i.e. 63.01% followed by Low birth weight; Twins ; Birth order >4.

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