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Original Research Article

A cross sectional study to find incidence of clinically detectable congenital malformations and factors affecting it in tertiary care hospital

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ABSTRACT

Background: Congenital malformations are emerging as an important perinatal problem, contributing sizably to the perinatal mortality with considerable repercussions on the mothers and the families. Patients with multiple congenital anomalies present a relatively infrequent but tremendously difficult challenge to the pediatrician. Authors objective was to study the incidence of clinically detectable congenital malformations among consecutive births in hospital deliveries examined during hospital stay.
Methods: A prospective cross sectional study was conducted in Department of Pediatrics at Dr R N Cooper Municipal General Hospital, Mumbai from June 2016 to June 2017. All live births from June 2016 to June 2017 were considered in the study
Results: The total number of deliveries in our hospital were 3120(100%) and the total number of babies with congenital anomaly were 43(1.4%), So the incidence of congenital anomalies amongst study population was 1.4%. The involvement of various systems was seen in our study. The involvement of CNS (9.3%), Eye (7%), ENT (28%), GIT (20.9%), Urinary Tract (2.3%), Musculoskeletal System (35%), Gentialia (7%), CVS (7%).
Conclusions: Congenital malformation, one of the important causes of infant mortality and morbidity can be reduced by proper preconception care and level two anomaly scan. Congenital anomalies must be identified, as early diagnosis and surgical correction of malformed babies offer the best chance for survival.

Keywords: Anamoly, Birth congenital, Marriage, Malformation

INTRODUCTION

Congenital anomalies account for 8 to 15% (1-2) of perinatal deaths and 13 to 16% of neonatal deaths in India.[1] Congenital malformation are emerging as an important perinatal problem, contributing sizeable to the perinatal mortality with considerable repercussions on the mothers and the families. Patients with multiple congenital anomalies present a relatively infrequent but tremendously difficult challenge to the pediatrician. These children have a wide array of problems including complex medical management issues, abnormalities in growth, special educational needs, behavioral and psychological problems, and cosmetic concerns. The pediatrician is faced with the challenge of making a diagnosis, pursuing therapeutic or prophylactic options, offering a prognosis and often, discussing recurrence risks with the family. Clinically detectable congenital anomalies at birth are the abnormalities which are detected by history and clinical examination or which are visible structural defects, for example spina bifida is obvious at birth whereas anomalies like congenital heart diseases and esophageal atresia's are detected by thorough clinical examination but hemophilia a

functional defect (a bleeding disorder) is not usually obvious until infancy or childhood. The most common, severe congenital anomalies are neural tube defects, esophageal atresia's and skeletal dysplasia's.

Anomaly rates can be reduced by using certain preventive strategies. These include folate supplementation (preconception and antenatal), avoidance of consanguineous marriage, control of diabetes and avoidance of aforementioned risk factors, such as radiation exposure and antimetabolites.[2-4] Therefore, we are conducting this study in order to study the incidence and pattern of clinically detectable congenital malformations in new born and it correlation with risk factors like 2 consanguinities of marriage and maternal diabetes, so that it can help doctors and policy makers to plan effective intervention programs.

Objectives

- To study the incidence of clinically detectable congenital malformations among consecutive births in hospital deliveries examined during hospital stay.
- To find out the correlation of congenital anomalies with maternal diabetes and consanguinity of marriage.

METHODS

A prospective cross sectional study was conducted in Department of Pediatrics at Dr R N Cooper Municipal General Hospital, Mumbai from June 2016 to June 2017. All live births from June 2016 to June 2017 were considered in the study.

Inclusion criteria

- All live births with congenital malformations born in the hospital.

Exclusion criteria

- All still births in the hospital
- Newborns with congenital malformations born outside the hospital.
- Newborns in whom anomalies detected during follow up or after discharge from hospital.

Data collection technique and tools

This study was carried out in the department of Pediatrics in a tertiary care hospital. In this study patients who fulfilling the inclusion and exclusion criteria were considered for the study. The ethics clearance was obtained from the appropriate authority appointed by the institution (ethics committee). Assessment of congenital malformations with various presentation by – History, Examination, Relevant investigations. Information was collected in semi structured Preform in each case with consent of parents.

Outcome to be assessed

- Incidence of Major and Minor congenital anomalies.
- Correlation of congenital anomalies with maternal diabetes and consanguinity of marriage.

Statistical analysis

The data was tabulated and master chart was prepared. All the collected data was entered in Microsoft Excel sheet and then transfer to SPSS software version 17 for analysis. Quantitative data was presented as mean and SD. Qualitative data was presented as frequency and percentages and analyzed using fisher's exact test (in case of 2x2 contingency tables) to find out the association between congenital anomalies and various risk factors. P-value < 0.05 was taken as level of significance.

RESULTS

The total number of deliveries in our hospital were 3120 (100%) and the total number of babies with congenital anomaly were 43(1.4%), So the incidence of congenital anomalies amongst study population was 1.4%. In our study most of the babies with congenital anomaly were male (58.1%) and 41.9% were females. The mothers of babies with congenital anomaly belongs to the age group of 19 to 25 years (51.2%) followed by 26 to 30 years (44.2%) and More than 30 years (4.7%). Father of babies with congenital anomaly was Less Than 30 Years (74.4%) followed by More Than 30 Years (25.6%).

In our study most of the mothers of babies with congenital anomaly were Multigravida (55.8%) followed by Primigravida (44.2%). Most of the babies with congenital anomaly were born out of Non-Consanguineous (81.4%) followed by Consanguineous (18.6%). Nearly 95.35 of the mothers were registered pregnancy followed by Unregistered (4.7%). Singleton (95.3%) was the most common nature of gestation amongst mothers of babies with congenital anomaly followed by twin (4.7%) (Table 1).

In our study 95.3% of mothers of babies with congenital anomaly had history of folic Acid supplementation, 4.7% of mothers of babies with congenital anomaly had history of Gestational Diabetes. The most common birth weight amongst babies with congenital anomaly 2.1 to 3 kg (69.8%) followed by 1 to 2 kg (18.6%) and more than 3 kg (11.6%). Normal vaginal (79.1%) was the most common mode of delivery amongst mothers of babies with congenital anomaly followed by LSCS (20.9%) (Table 2).

The involvement of various systems was seen in our study. The involvement of CNS (9.3%), Eye (7%), ENT (28%), GIT (20.9%), Urinary Tract (2.3%), Musculoskeletal System (35%), Gentialia (7%), CVS (7%) (Table 3).

Table 1: Incidence of congenital anomalies and social profile amongst study population.

Social Profile		Frequency (43)	Percent
Incidence	Total number of Delivery	3120	100
	Total number of Babies with congenital anomaly	43	1.4
Gender	Male	18	41.9
	Female	25	58.1
Age group of mothers	19 to 25 years	22	51.2
	26 to 30 years	19	44.2
	More than 30 years	2	4.7
Age group of fathers	Less than 30 Years	32	74.4
	More than 30 Years	11	25.6
Gravida	Primigravida	19	44.2
	Multigravida	24	55.8
Nature of marriage	Consanguineous	8	18.6
	Non-consanguineous	35	81.4
Education	Graduate	1	2.3
	Illiterate	2	4.7
	Upto 10th std	40	93
Registration status	Registered	41	95.3
	Unregistered	2	4.7
Nature of gestation	Singleton	41	95.3
	Twin	2	4.7

Table 2: History of folic acid supplementation and gestational diabetes of mothers and birth profile of babies with congenital anomaly.

Associated Factors		Frequency (43)	Percent
Folic Acid supplements	Yes	41	95.3
	No	2	4.7
Gestational diabetes	YES	41	95.3
	No	2	4.7
Birth weight	1 to 2 Kg	8	18.6
	2.1 to 3 Kg	30	69.8
	More than 3 Kg	5	11.6
Mode of delivery	LSCS	9	20.9
	Normal vaginal	34	79.1
Family H/O birth of a child with congenital anomaly	Yes	2	4.7
	No	41	95.3

Table 3: Involvement of different System among study subjects.

System involved		Frequency (43)	Percent
Central Nervous System	Yes	4	9.3
	No	39	90.7
Eye	Yes	1	7
	No	42	93
ENT	Yes	12	28
	No	31	72
GIT	Yes	9	20.9
	No	34	79.1
Urinary tract	Yes	1	2.3
	No	42	97.7
Musculoskeletal system	Yes	15	35
	No	28	65
Genitalia	Yes	3	7
	No	40	93
CVS	Yes	3	7
	No	40	93

The congenital anomalies were observed in 4.7% of gestational diabetic mothers and 95.3% of non-diabetic mothers and this difference is statistically not significant (Table 4).

Table 4: Comparison of gestational diabetes status with congenital anomalies amongst study population.

Gestational diabetes	Congenital anomalies		Total
	Yes	No	
Present	2(4.7%)	451(14.6%)	453(14.5%)
Absent	41 (95.3%)	2626 (85.3%)	2667(85.4%)

The congenital anomalies were observed in 18.6% of consanguineous marriage and 81.4% of non-consanguineous marriage and this difference statistically not significant (Table 5).

Table 5: Comparison of Nature of Marriage with Congenital Anomalies amongst study population.

Nature of marriage	Congenital Anomalies		Total
	Yes	No	
Consanguineous	8(18.6%)	876(28.5%)	884(28.3%)
Non-Consanguineous	35 (81.4%)	2201 (71.5%)	2236(71.7%)

p value - 0.175

DISCUSSION

In the present study, the total number of live births in our hospital were 3120(100%) and the total number of babies with congenital anomaly was 43(1.4%). So the incidence

of congenital anomalies amongst study population was 1.4%.

In the study done by Bhalerao and Garg 5(1.38%) and Alawad AM et al, (1.1%), the incidence of Congenital anamolies were similar to our study findings.[6]

The male babies were most commonly affected than Female babies, it may be because of the fact that the females were afflicted with more lethal congenital malformations and could not survive to be born with signs of life. The results of our study findings were similar to the study findings of Tapan Pattanaik et al, Bhalerao and Garg, Doddabasappa et al.[7,5,8]

The age of the mother during pregnancy associated with congenital anomalies in our study showed lea than 25 years were more commonly affected, similar results were also seen in the study done by Tapan Pattanaik et al, and S. Lakshmi Vinodh et al.[7,9]

The Multigravida Mothers were commonly affected by Congenital anomalies in our study which is comparable to the study findings of Tapan Pattanaik et al, and Bhalerao and Garg.[5,7]

In the present study, congenital anomalies were observed in 18.6% of consanguineous marriage and 81.4% of non-consanguineous marriage, similar results were also seen in the study done by Tapan Pattanaik et al, and Bhalerao and Garg.[5,7]

In the present study, most of the mothers of babies were registered (95.3%) followed by Unregistered (4.7%) which is in contrast to the study findings of Sandya rani et al, where it was seen almost equally in both the groups.[11]

The findings of the weight of babies associated with congenital anomalies in our study were similar to the study findings of S Lakshmi Vinodh et al, and Alawad AM et al.[6,9]

The findings of our study was comparable to the S Lakshmi Vinodh et al Findings where singleton had more incidences of Congenital Anamolies.[9]

The involvement of Various systems was seen in our study. Similarly, S. Lakshmi Vinod et al and Kokate P et al also observed congenital anomalies in most of the systems.[9,10]

In authors studies babies born to diabetic and non-diabetic mother the difference is statistically not significant as P value is 0.0779. This finding is in agreement with the study conducted by Kokate P et al., congenital anomalies were observed in 6 % of babies with congenital anomalies were born to diabetic mothers.[10] (54) Similar finding was observed by Sandhya Rani et al., in which 10% of babies with congenital anomalies were born to diabetic mothers.[11]

The consanguineous Marriage was found to be statistically not significant as P value is 0.1752 when compared with congenital anomalies seen in the newborns. In the study conducted by Tapan Pattanaik et al, total 6% cases had consanguineous marriage (53). Our study showed a higher incidence of congenital malformation in babies born out of consanguineous marriage.[7]

CONCLUSION

Congenital malformation, one of the important causes of infant mortality and morbidity can be reduced by proper preconception care and level two anomaly scan. The incidence of congenital anomalies in our study was 1.4%. We did not find an association of diabetes and type of marriage with congenital anomalies this is unlike other studies. Musculoskeletal system was the most common system involved with Congenital Anomalies followed by ENT, GIT, CNS, CVS, Genitalia, Eye and urinary tract.

Recommendations

Congenital anomalies must be identified, as early diagnosis and surgical correction of malformed babies offer the best chance for survival. Present study stresses upon the importance of carrying out a thorough clinical examination of neonate at birth.

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