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Research Article

A study on incidence of congenital anomalies in new borns and their association with fetal factors: a prospective study

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ABSTRACT

Background: Congenital malformation represents defects in morphogenesis during early fetal life. Congenital anomalies account for 8–15% of perinatal deaths and 13–16% of neonatal deaths in India. The objective was to study incidence of clinically detectable congenital malformations in new-borns delivered at a tertiary hospital and their association with fetal factors.
Methods: The present study is a prospective study of all the newborns delivered at Obstetrics and Gynecology Department, New Civil Hospital, Surat for a period of one year from 1st January 2010 to 31st December 2010. Total 5518 consecutive births including both live born babies and still born babies were examined after taking verbal and written consent of their mothers for a visible structural anomalies to determine the overall incidence and distribution of congenital malformations and their association with fetal factors. Data were statistically analyzed using SPSS software (trial version).
Results: A total of 5518 babies were born out of which 75 were twins. Total numbers of malformed babies were 68, so total point incidence of congenital anomalies turned out to be 1.23%. There were 2963 male new-borns, out of that 40 were congenitally malformed (1.34%) and out of 2555 female new-borns 28 were congenitally malformed (1.09%). No significant association was found between congenital malformation and sex of the child. Out of total 5518 new-borns 5316 were live births and 202 were still births and out of 5316 live births 48 babies were malformed and out of 202 still births 20 babies were malformed. Out of total 5518 new-borns 1227 had birth weight less than 1500 grams and out of them 12 (0.97%) babies were congenitally malformed. Out of 5518 new-borns 221 were preterm babies and out of 221 preterm babies 26 (12.32%) babies were congenitally malformed.
Conclusions: From present study it has been concluded that congenital anomalies in new-borns were significantly associated with fetal factors like still birth, prematurity and low birth weight.

Keywords: Congenital anomalies, Congenital malformations, Still births, Birth defects, Fetal factors

INTRODUCTION

The most traumatic experience for a gravid woman, her husband and their family, is, undoubtedly, the unheralded birth of deformed child, precipitating feeling of horror, inadequacy and failure in parents.[1]

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.[2] 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.[3,4]

Patients with multiple congenital anomalies present a relatively infrequent but tremendously difficult challenge to the paediatrician. 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. In the coming decades, this is going to be a leading cause of morbidity and mortality in centers providing good neonatal care. Also, increased use of irradiation, alkylating agents, antimetabolites, self-drugging, smoking, alcohol consumption has contributed to increased incidence of congenital malformation.

It is estimated that 1 in 40 or 2.5% of new-borns have a recognizable malformation or malformation at birth.[5] In India with decreasing mortality due to infection and nutritional disorders, incidences in death due to congenital malformation are increasing.[6] A study done at AIIMS show that congenital malformations contributed to 13.4% of perinatal deaths as compared to 9% a decade back.[7] Major malformation accounts for 15% of neonatal death.[8]

Studies like present series and other on-going multicentre study programmes are expected to alert us with regard to new teratogen, better understanding of the epidemiological implications and thereby helping us in preventing the occurrence and better management of congenital malformation. This study has been conducted to throw light on overall and individual incidence and of clinically detectable congenital malformations in new-borns delivered at a tertiary hospital and their association with fetal factors.

METHODS

The present study is a prospective study of all the new-borns delivered at Obstetrics and Gynecology Department, New Civil Hospital, Surat for a period of one year from 1st January 2010 to 31st December 2010. Before conducting the study approval was obtained from institutional ethical committee for human research. Data safety and confidentiality was also given due consideration. The file containing identity related details was kept password protected and the filled Performa were kept in lock with key accessible only to researcher. Total 5518 consecutive births including both live born babies and still born babies were examined after taking verbal and written consent of their mothers for a visible structural anomalies to determine the overall incidence of congenital malformations and to establish various fetal factors which seems to have a causal relationship. To cover all the findings of relevant history and of examination, a performa was predesigned. According to it a complete medical history and family history for any congenital malformation, antenatal history for exposure to infection, drugs and irradiation, maternal history for age, consanguinity and parity and personal history was taken. High risk neonates were examined in detail by a neonatologist. All the babies were examined within 12 hours of birth. Thorough physical examination of new-born babies was done. Immediate outcome of all the malformed babies was recorded during the period of mother's hospital stay and attempt was made to find out any history of congenital malformations in other family members.

Any malformed baby suspected of having syndromic congenital malformation was also confirmed by investigations e.g. ultrasonography, x-ray, echo and also by taking expert opinions of paediatrician. Data were statistically analysed using SPSS software (trial version).

RESULTS

In the present study, we studied the total numbers of babies born in New Civil Hospital, Surat for a period of one year from 1st January 2010 to 31st December 2010. A total of 5518 babies were born out of which 75 were twins. Total numbers of malformed babies were 68, so total point incidence of congenital anomalies turned out to be 1.23% (Table 1).

Table 1: Incidence of congenital anomalies.

Total No. of deliveries	5443
Total No. of twin deliveries	75
Total No. of new-borns	5518
Total No. of malformed new-borns	68
Incidence of congenital anomalies	1.23%
Incidence of congenital anomalies/1000 births	12.32

Table 2: Association of type of birth with congenital anomalies.

Type of birth	No. of babies born	No. of malformed babies	Percentage
Live birth	5316	48	0.90%
Still birth	202	20	9.90%

$p<0.000001$, $\chi^2 = 129.45$

Out of total 5518 new-borns 5316 were live births and 202 were still births and out of 5316 live births 48 babies were malformed and out of 202 still births 20 babies were malformed. Statistically significant association was found between congenital malformation and still birth (Table 2). There were 2963 male new-borns, out of that 40 were congenitally malformed (1.34%) and out of 2555 female new-borns 28 were congenitally malformed (1.09%). No significant association was found between congenital malformation and sex of the child (Table 3). Out of 5518 new-borns 1227 had birth weight less than 1500 grams and out of them 12 (0.97%) babies were congenitally malformed. Statistically significant association was found between congenital malformation and low birth weight (Table 4). Out of 5518 new-borns 221 were preterm babies and out of 221 preterm babies 26 (12.32%) babies

were congenitally malformed. Statistically significant association was found between congenital malformation and prematurity (Table 5).

Table 3: Association of gender with congenital anomalies.

Gender of baby	No.of babies born	No. of malformed babies	Percentage
Male	2963	40	1.34%
Female	2555	28	1.09%

p=0.39, $\chi 2 = 0.73$

Table 4: Association of birth weight with congenital anomalies.

Birth weight (gm)	No. of babies born	No. of malformed babies	Percentage
<1500	1227	12	0.97%
1500-1999	1652	32	1.93%
2000-2499	1342	15	1.11%
>/= 2500	1297	9	0.69%

$p<0.05$, $\chi 2 = 10.63$

Table 5: Association of maturity of the babies with congenital anomalies.

Maturity of the baby	No. of babies born	No. of case	Percentage
Preterm	221	26	12.32%
Full term	5297	42	0.80%

P=0.000001, $\chi 2 = 209.802$

DISCUSSION

In our study incidence of congenital anomalies was 1.23%. Other studies like Datta, et al, Swain, et al, Taksande A, et al, Anand, et al and Karla, et al showed incidence of congenital anomalies were 1.24%, 1.2%, 1.91%, 2% and 1.98% respectively.[4,6,9-11] Studies like Desai N, et al and Saifullah, et al showed slightly higher incidence (3.6%) than our study.[12,13] The true incidence of congenital malformations depends upon several factors and no two studies are strictly comparable. It depends upon ethnic background, population sample (hospital or community based, live birth or total birth), nature of study (prospective or retrospective), age at the time of diagnosis ,duration of follow up , autopsy rate, diagnostic facility available and enthusiasm and acuteness of physician. In the present series, low incidence in comparison to other studies is possibly because of malformations only present at birth were included. All those malformations recognized as result of autopsy study or which were diagnosed later on was excluded.

In our study, out of 202 still born babies, 20 (9.90%) babies were malformed while out of 5316 live born babies, 48 (0.90%) babies were malformed. other studies like Datta, et al, Swain, et al and Taksande A, et al also found higher incidence of congenital malformations in still birth.[4,6,9] Usually major malformations are incompatible with life this may the reason of high incidence of congenital malformation in still born babies. In our study no significant association was found between congenital malformation and sex of the child. Similar results were also obtained in studies like Datta, et al, Swain, et al, Taksande A, et al and Saifullah, et al. [4,6,9,13]

In our study statistically significant association was found between congenital malformation and low birth weight. Low birth weight was associated with increased risk of congenital malformations. This highlights the fact that the presence of congenital anomaly itself hampers the growth of a developing foetus. This fact is also highlighted in other studies such as Taksande A, et al, Karla, et al, Desai N, et al and Saifullah et al.[9,11-13] In our study statistically significant association was found between congenital malformation and prematurity. This is particularly a cause of concern as prematurity and stillbirths are a major cause of perinatal mortality. Similar findings were also obtained in other studies such as Taksande A, et al, Karla, et al, Desai N, et al and Saifullah et al.[9,11-13]

This study was conducted in a tertiary care centre with specialized maternal and neonatal care. Therefore the number of mothers and babies with complications could be more than that in the community. Hence the rate of occurrence of malformations among babies also could be more than that in the general population.

CONCLUSION

From present study it has been concluded that congenital anomalies in new-borns were significantly associated with fetal factors like still birth, prematurity and low birth weight. More emphasis should be given on prevention by regular antenatal care and avoidance of known teratogens and probable teratogenic agents. Antenatal diagnosis, genetic counselling, better diagnostic and management facilities should be provided to improve the outcome.

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