

# A STUDY ON INCIDENCE OF VARIOUS SYSTEMIC CONGENITAL MALFORMATIONS AND THEIR ASSOCIATION WITH MATERNAL FACTORS

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## ABSTRACT

**Objectives:** To study the overall and individual incidence of clinically detectable congenital malformations in newborns delivered at a tertiary hospital and to find out the associated maternal factors.

**Methodology:** The present study is a prospective study of all the newborns delivered at Obstetrics and Gynecology Department, SSG Hospital, Baroda for a period of one year in which total 4058 consecutively born babies were examined for all visible structural anomalies and associated maternal factors were studied.

**Results:** Incidence of malformed babies was 1.53% (62 malformations out of 4058 babies) of which the anomalies of CNS were the most frequent. In associated maternal factors, anaemia and diabetes were found to be relevant.

**Conclusion:** The incidence of congenital anomalies of CNS was highest amongst all types of congenital anomalies (neural tube defects being the commonest). More stress should be laid on prevention by regular antenatal care and avoidance of known teratogens and probable teratogenic agents.

**Keywords:** Congenital Malformations, Maternal factors, Preconceptional counselling

## INTRODUCTION

A large number of malformations are incompatible with life and they involve one system or multiple systems of the fetus. A common example is central nervous system malformations which are usually incompatible with life. In the early part of the 19th century the percentage of deaths from congenital anomalies was relatively low. This was because, preventive medicine, immunology and antibiotics were not in usage. Now, number of deaths from infections, metabolic and endocrinal disorders has decreased and so birth defects as a cause of perinatal mortality have come to the forefront. Also, increased use of irradiations, alkylating agents, antimetabolites, smoking, and alcohol consumption has contributed to increased incidence of congenital anomalies. Congenital malformations often cause mental trauma to the parents since it puts the entire life of child with congenital malformations into jeopardy. A ray of hope has come in the form of prenatal diagnosis of congenital anomalies. It has now become an integral part of modern obstetrics. Preconceptional counseling is the rule of the day. Screening programmes for patients at high risk for anomalies is the latest trend. Procedures like genetic amniocentesis and chorionic

villus sampling (CVS) are employed in high risk mothers to diagnose such malformations at early gestational age.

Therefore, not only can we prevent the birth of such deformed children by judicious counselling, but even if such a child is conceived, early detection of the anomaly can help in deciding whether the pregnancy should be terminated or whether prenatal fetal therapy can be employed and if pregnancy is to be continued, the optimum time and modes of delivery can be decided before hand.

## MATERIALS & METHODS

The present study is a prospective study of all the newborns delivered at Obstetrics and Gynecology Department, SSG Hospital and Medical College, Baroda for a period of one year from 1<sup>st</sup> April 2009 to 31<sup>st</sup> March 2010.

Total 4058 consecutive births including both live born babies and still born babies were examined for a visible structural anomalies to determine the overall incidence of congenital malformations and to establish various

etiological 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 newborn 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 pediatrician.

### OBSERVATION & RESULTS

In the present study, we studied the total numbers of babies born in SSG Hospital in one year i.e., from 1<sup>st</sup> April 2009 to 31<sup>st</sup> March 2010. A total of 4058 babies were born out of which 35 were twins and two were triplet deliveries. Total numbers of malformed babies were 62, so total point incidence of congenital anomalies turned out to be 1.53%.

**Table 1: Systemic Distribution of Congenital Malformed Babies**

System	Malformed babies	Live born babies	Still born babies	Incidence/1000 births
Central Nervous System	26	6	20	6.40
Multiple congenital anomalies	8	3	5	2.0
Musculoskeletal	6	5	1	1.50
Gastro Intestinal System(GIT)	7	4	3	1.75
Cardiovascular System(CVS)	9	6	3	2.25
Genito Urinary System(GUT)	4	3	1	0.98
Chromosomal	2	2	0	0.49

As far as systemic distribution of congenital malformed babies is concerned, in the present study, it was observed that out of total 4058 babies, 26 were having

central nervous system malformations making its incidence of 6.4/1000 live births which turned out to be highest.

**Table 2: Maternal Factors and Incidence of Malformed Babies**

Maternal Factors	Cases	Malformed babies (%)	Incidence per 1000 births
Malnutrition with anaemia	3200	31 (0.96)	7.6
Previous Abortion	151	3 (1.98)	0.73
Drugs during First Trimester	206	1 (0.48)	0.24
Maternal Diabetes	7	2 (28.5)	0.49
Pre-eclamptic Toxemia	201	8 (3.9)	1.97
Antepartum Haemorrhage	56	3 (5.35)	0.73
Oligohydramnios	39	2 (5.12)	0.49
Polyhydramnios	51	6 (11.7)	1.47
Exposure to radiation	8	1 (12.5)	0.24
Tobacco/Drug abuse	1731	12 (0.69)	2.95

In the present study we studied the history of all 4021 mothers and found anaemia, malnutrition and diabetes as important and quite preventable associated factors. Maternal diabetes as evident is an important associated factor which can be easily diagnosed and prevented beforehand.

### DISCUSSION

In the present study, attempts have been made to find the total and individual systemic incidence of anomalies in hospital deliveries and to find causal relationship and

association, if any, between various etiological factors and congenital anomalies

Total number of 4058 consecutive births was studied in the perinatal period from 1<sup>st</sup> April 2009 to 31<sup>st</sup> March 2010. Incidence of malformed babies was 1.53% (62 malformations out of 4058 babies).

The anomalies of CNS (6.4/1000 births ) were the most frequent, multiple congenital anomalies (2/1000 ), musculoskeletal system (1.5/1000), gastro intestinal system(1.75/1000), cardiovascular system (2.25/1000), genitourinary system (0.98/1000) and chromosomal disorders(0.49/1000).

Neural tube defects were most common among all individual anomalies. Incidence was 6.4/1000 babies followed by acyanotic heart defects (1.72/1000 births). Maximum mortality was seen in live births with CNS anomalies. Meningocele, meningomyelocele and anencephaly (3.85/1000 births) accounted for more number of anomalies in CNS. The anomalies of CNS were more common in still born and there was gross difference in the incidence in male to female babies (3:10). Ratio of live born to still born was 5:8. The anomalies were more common in still born and in male babies with multiple congenital In the present study, we studied all the 4021 mothers for any risk factors and found that 3200 mothers were anaemic and had 31 malformed babies with percentage of 0.96%. 3 mothers out of 151 with history of previous abortions gave birth to anomalous babies i.e. 1.98%. Out of 4021 mothers 206 had history of drugs during first trimester in form of some analgesics. 0.48% of them had anomalous child. 28.5% of the diabetic mothers had anomalous babies i.e. with cardiovascular malformation. 3.9% of the pre eclamptic mothers gave birth to anomalous babies. Only 5.35% of the mothers with antepartum haemorrhage give birth to anomalous babies. Percentage of anomalous babies in mothers with oligohydromniotic, polyhydromniotic, exposure to radiation and drug abuse was 5.12, 11.7, 12.5 and 0.69% respectively.

As compare to the Department of Atomic Energy project (1998), this present study has shown an increase of 0.14% in CNS malformations whereas an apparent decrease of 4.1% and 2.9% in musculoskeleton and gastrointestinal malformations respectively. This difference can be attributed to various factors. The true incidence of congenital malformation depends upon several factors and therefore two studies are never strictly comparable. Studies depend upon population sample, nature of study, whether minor defects included or not, diagnostic facility etc. As the

diagnostic facilities are advancing, intra-uterine congenital malformation detection is more accurately diagnosed.

## CONCLUSION

The present study gave us an idea regarding incidence and distribution of congenital anomalies and also its relation with associated maternal and fetal factors.

From present study we conclude that incidence of congenital anomalies of CNS was highest amongst all types of congenital anomalies (neural tube defects being the commonest).

More stress should be laid 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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