

PATTERN OF BABIES WITH CONGENITAL MALFORMATIONS ADMITTED IN A TERTIARY NEWBORN CARE UNITD. Saminathan¹, B. Mythili², Sirajuddin Nazeer³, Geetha Manivannan⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIM: To determine the pattern of congenital malformation in the neonates admitted in Mahatma Gandhi Memorial government Hospital, Trichy. **METHOD:** 16,672 live birth babies delivered in Mahatma Gandhi Memorial government Hospital, Trichy were screened for external congenital malformation during the study period august 2011 to august 2013. Total of 232 neonates were diagnosed have congenital malformations. Radiological investigations was done to confirm internal anomalies in asymptomatic neonates. **RESULTS:** Study showed a prevalence of major congenital malformation to be 13.9/1000 live births, neural tube defects being the commonest (25%). The incidence is significantly high in mother of age group >35 years, increasing parity, positive family history. Congenital malformation constitutes a significant proportion of neonatal mortality. **CONCLUSION:** Congenital malformations are higher in mothers age group of >35 increasing parity, maternal hyperglycemia and preterm babies. Periconceptional folic acid intake is important to prevent neural tube defects.

KEYWORDS: Congenital malformation, neonate, neural tube defect, maternal hyperglycemia, folic acid.

INTRODUCTION: Congenital malformations contribute significantly to stillbirth, preterm birth and to neonatal morbidity and mortality. The worldwide incidence of congenital malformation is about 3-7%, affecting about 1 in 33 infants, but may vary widely between countries. Recent studies from India suggest similar prevalence.¹ about 50% of stillbirths are associated with congenital malformation. They are mostly detected at birth and results in 3.2 million birth defect-related disabilities every year. The etiology of most congenital anomalies are maternal impressions, genetic and embryological developmental defects and arrest and multifactorial complex causation. Structural anomalies are the commonest congenital defects and most common serious disorders are heart defects, neural tube defects and Down syndrome.²

Early recognition of anomalies is important for planning treatment, immediate medical and surgical therapy being essential. In 2010 the World Health Assembly adopted a resolution calling all Member States to promote primary prevention and the health of children with congenital anomalies and develop national programs.³

MATERIAL AND METHODS: This prospective descriptive study was carried out between August 2011 to August 2013 in to determine the pattern of major congenital malformations in neonates admitted in a tertiary care neonatal unit of Mahatma Gandhi Memorial government Hospital, Trichy, and Tamilnadu, India. All the intramural deliveries during these two year period admitted to Neonatal unit, Mahatma Gandhi Memorial Government Hospital, Trichy, Tamil Nadu were screened for external congenital malformations and radiological investigations done to confirm internal

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anomalies in asymptomatic neonates. These neonates were followed up for a week and the outcome was analyzed.

RESULTS: The 16672 live born during the study period in our hospital were included in the study (n=16672). 232 live born were found to have major congenital anomalies, an incidence of 13.9 per 1000 live births.

In accordance to the maternal age, the live born were grouped into 5 groups - less than 20 years, 21 to 25 years, 26 to 30 years, 31 to 35 years and above 35 years of age. Of 1787 born to mothers with less than 20 years age, 16 had congenital malformation (0.9%). 5276 born to mother in 21 to 25 years of age and 82 among them were malformed babies (1.6 %). 93 among 6067 babies in 26 to 30 years of age were malformed (1.6%). The incidence of the congenital malformation was high in mothers with age group above 35 years 19 of 426 (4.7%, $p = 0.003$).

In the total of 16672 live born babies, 1167 mothers had history of prior abortions. 21 among those mothers had malformed babies. About 9% of mothers, a significant population, had prior history of abortions ($p=0.000$). Among the 15505 mothers who had no prior abortions, 211 had malformed babies.

The live born were grouped into five groups based on the parity of the mothers. Out of the total 16672 live born, 8752 were primipara, 5245 were of second para, 2068 of third parity, 520 were of fourth parity and 87 were of parity 5 and above. 126 of 8752, 63 of 5245, 28 among 2068, 12 of 520 and 3 among 87 belonging to the parity of 1,2,3,4, above 5 respectively had malformed babies. The incidence was high in parity of 5 and above (3.1 %). It was observed that as parity increased, the incidence of congenital malformation increased ($p < 0.05$).

It was observed that 6 out of 232 babies (2.6%) had family history of congenital malformation ($p=0.005$). 226 (97.4%) babies had no family history of any structural malformations.

39 babies of 232 (16%) were born to consanguineous parents, Second degree in 24 and third degree in 15. Thus, a significant proportion of malformed babies were born to consanguineous parents. Incidence was higher for second degree consanguinity (10.3%) than for third degree (6.03%).

Among 232 babies, 23 (10%) had pregnancy induced hypertension, 17 (7.3%) had diabetes mellitus, 6 (2.5%) had drug intake, 5 among them took anti-convulsant (3 had sodium valproate, 2 had carbamazepine) and one had anti-psychotics (Risperidone). 6 of them had co-existence of both diabetes mellitus and pregnancy induced hypertension. 12 (5%) had polyhydramnios - 8 had neural tube defects, 2 had trachea esophageal fistula, 1 with VATER anomaly and 1 had calcaneo valgus deformity.

It was observed that 154 mothers of 232 malformed live born (61.2%) had irregular intake of folic acid supplementation in the perinatal period. In 8 (8.6%) mothers, they did not receive any supplements during the antenatal period. Only 70 (30.2%) mothers took regularly folic acid supplements. 49 of 58 anomalies in central nervous system correlated with irregular intake of folic acid tablets.

Congenital malformation found to significantly (4.2%) increase the risk of instrumental deliveries ($p < 0.05$).

In the total live born of 16672 babies, 2 of 35 (0.9%) among extreme low birth weight, 8 of 1081 (3.4%) among very low birth weight, 88 of 944 (37.5%) of low birth weight, 134 of 14612 (57.7%) of normal weight babies were malformed.

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Among the malformed babies, 57.7% babies were above birth weight above 2.5kg. 37% babies were in the low birth weight group and 10 babies were very low birth weight category. The difference is not statistically significant ($p>0.05$).

12 of 1695 preterm babies, 32 of 321 late preterm babies, 188 of 14424 term babies were malformed. 9% of late preterm babies were malformed. A significant proportion of malformed babies were late preterm ($p=0.03$).

In the total of 232 malformed babies, the most common system to involve is central nervous system (24.9%). this is followed by gastro intestinal system (23.3%). this is followed by musculoskeletal system (16.4%), genito urinary tract constitute 13.8% cardio vascular system (7.8%), respiratory system (6.9%). syndromic association was noted in 12 babies (5.2%). Multiple anomalies were seen in 10 babies (4.3%).

In the total of 16672 babies, 356 expired and 16316 survived the neonatal period. In the total malformed babies, 38 babies out of 232 (16.3%) expired in the early neonatal period. ($p<0.05$).

Sl. No.	Maternal parameters	Number	Percentage
1.	Maternal age > 35	19	8.1 ($p=0.003$)
2.	Parity =>4	15	6.4 ($p=0.007$)
3.	Consanguinity	39	16.8 ($p=0.01$)
4.	Maternal hyperglycemia	162	69.8($p=0.07$)

Table 1

Sl. No.	Neonatal parameters	Number	Percentage
1	Male	110	47.4 ($p=0.31$)
2	Birth weight < 2.5	98	42.2 ($p=0.16$)
3	Late preterm	32	13.7 ($p=0.03$)

Table 2

Sl. No.	System involvement	Number	Percentage
1	Central nervous system	58	24.9
2	Gastrointestinal system	54	23.3
3	Musculo skeletal	38	16.4
4	Others	70	30.1
5	Syndromic	12	5.2
6	Multiple malformation	10	0.43

Table 3

DISCUSSION: The prevalence of congenital malformation in the present study of 13.9 per 1000 live birth (1.39%) is comparable to other hospital based studies in India.^{1,2,4} Sex distribution of malformation, a male to female ratio was equal. This is in contrary to most studies that report male preponderance.¹Incidence of malformations was higher in maternal age more than 35 years, similar to other studies which suggest higher incidence with increasing age.¹ Multiparity is another factor

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noted with higher incidence of congenital malformations occurring in parity 4 and more (6.41% and 7.69%).^{2,3,5} Present study shows more malformed babies (67.11%) among those born of consanguineous marriages.^{2,3,5} In the present study incidence of malformations in premature babies was higher (6.31%) than that of term babies (2.91%) and this difference is statistically significant $p < 0.05$. Our results are comparable with previous studies.³ In our study (7.3 %) 17 of the mothers with malformed babies gave history of pre-existing or recent onset of hyperglycemia, during pregnancy. Studies have shown conclusively that maternal hyperglycemia is associated with an increased risk of mal development in the conceptus, specially neural tube and cardiac defects though the exact mechanism is not known.^{6,7}

Central nervous system and Gastro intestinal system including orofacial group were the most commonly involved.⁸ the neural tube defects predominate in the central nervous system anomalies; the most common being meningomyelocele.

LIMITATION:

1. This is a hospital based study, thus the prevalence calculated may not reflect the exact prevalence of the community.
2. This study did not include still births.

CONCLUSIONS: This study shows a prevalence of major congenital malformation to be 13.9/1000 live births. Congenital malformation constitutes a significant proportion of neonatal mortality. There is no significant difference in incidence in male and female babies. The incidence is significantly high in mothers of age group of >35 years, increasing parity, maternal hyperglycemia. The neural tube defects predominate in the central nervous system anomalies; the most common is the meningomyelocele. Regular Periconceptional folic acid intake is important to prevent neural tube defects. There is a need to increase the awareness about folic acid, antenatal detection and appropriate management of congenital malformations.

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