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Prevalance of congenital anomalies among low RIK group in a tertiary care center, near rural areas of Thandalam, Chennai

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Abstract
Congenital anomaly contributes major perinatal mortality, morbidity and mental agony to parents. Identifying the cause, educating the public, will decrease the incidents of congenital anomalies
Aim: To assess the prevalence of congenital anomalies among low-risk groups in rural areas near Thandalam.
Methodology: Retrospective observational study from 2016 January to 2021 January. Data retrieved from birth defect register in Saveetha Medical College and Hospital. Maternal age, types of anomalies, outcome of foetus, geographic distribution, history of folic acid intake and maternal risk factors are analysed.
Results: Out of 3622 deliveries 198(5.4%) babies had congenital anomalies. Maternal age of >30 had 35% of anomalies. Maternal age <30 had 65%. Anomalies of CNS 50%, CVS 24%, GI tract 9 %, Renal 7%, Cleft lip and cleft palate 10%, Outcome for fetus was lethal in 46% cases and non-lethal in 54% cases. Mothers from remote areas of Kanchipuram (11%), Nemlicherry (10%), Chembarambakkam (22%), Nemam (19%), Vellore (5%), Chennai (11%), Tiruvannamalai (12%), Thiruvallur (10%). 42% of mothers are not taking folic acid, 68% taking folic acid. Maternal risk factors that caused the disease were nutritional deficiency and anaemia (32%), low risk (22%), gestational diabetes (18%), history of previous anomalies (11%), Consanguinity (10%), and Multigravida (7%).
Conclusion: Significant prevalence of congenital anomalies in low-risk groups in rural areas noted needs further study to find out the cause and awareness of folic acid to be promoted.

Keywords: congenital anomalies, cleft lip, cleft palate, anaemia, gestational diabetes, consanguinity

Introduction

Congenital anomalies still remain to be one of the major reasons for still births, neonatal mortality, morbidity and the major part of childhood morbidity. Globally around 295000 new-borns die in their neonatal period due to congenital anomalies [1]. The aetiology of around 40% - 60%of congenital anomalies are unknown, 30% - 40% are genetic causes and 5% - 10% are environmental causes [2]. Consanguineous marriages still remain to be one of the important factors for congenital malformations [3]. Though the aetiology behind most of the congenital anomalies still remain to be hidden, we can prevent it with the evidences which we have in hand like that of the neural tube defects which can be prevented by proper regular intake of folic acid during the periconceptional period [4]. Prevention of these congenital anomalies requires a proper epidemiological data with the prevalence and types of birth defects and genetic disorders by proper antenatal screening and follow up during the post natal period. The impact of the congenital anomalies is quite understood in the high income countries where as in the low income countries it is mostly neglected [7]. Hence educating the health care professional about preventing birth defects at low cost but with high impact is highly essential [5]. Additionally in Tamilnadu where around 81.1% of gravid mothers attend the minimum 4 antenatal care hence the role of primary prevention of congenital anomalies, identifying the anomalies using the ultrasound and planning about the intervention required is possible [6]. In this study we aimed to assess the prevalence and risk factors of congenital anomalies and check out on the outcomes of congenital anomalies in low risk groups in rural areas near Thandalam.

Methododlogy

The study was conducted in Saveetha Medical College and Hospital for a duration of 5 years from January 2016 to January 2021. The study is a retrospective observational study. Data was collected from the birth defect register in the hospital. Maternal age, type of anomalies, outcome of the foetus, geographic distribution, history of folic acid intake and maternal risk factors are analysed. Data entry and data processing were made using a Microsoft Excel (2007) and descriptive statistical analysis was done. All the variables were documented and studied.

Results

The total amount of deliveries during the study period were 3622 out of which 198(5.4%) babies had congenital anomalies. History

of antenatal mothers analysed. Maternal age, parity, consanguinity, previous history of anomalies, nutritional deficiency, diabetesand low risk group noted.

Table 1: Age of mother at the time of conception.

Maternal age >30years	35%
maternal age<30 years	65%

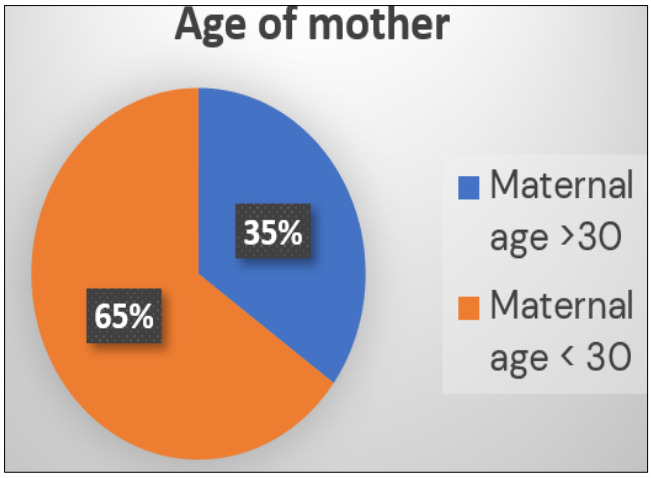


Fig 1: Age of mother at the time of conception.

Maternal age of >30years had 35% of anomalies whereas maternal age of <30 years had 65% of the anomalies.

Table 2: Maternal risk factors that causes congenital anomalies

nutritional deficiency and anaemia	32%
low risk	22%
Diabetes	18%
history of previous anomalies	11%
Consanguinity	10%
Multigravida	7%

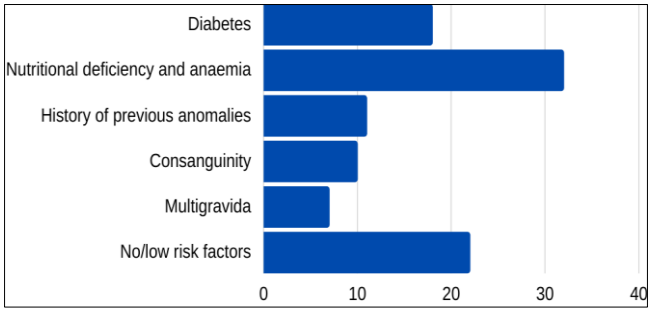


Fig 2: Maternal risk factors that causes congenital anomalies

Maternal risk factors that caused the disease were nutritional deficiency and anaemia (32%), low risk (22%), gestational diabetes (18%), history of previous anomalies (11%), Consanguinity (10%), and Multigravida (7%).

From antenatal mother's address, geographical distribution analysed. Our study population are from rural areas mostly from agricultural areas, factory area. Our study shows more prevalence of neural tube defects among mothers exposed to toxins from factories or fertilizer usage may play a role.

Table 3: Geographical areas from which the mother comes.

Kanchipuram	11%
Nemlicherry	10%
Chembarambakkam	22%
Nemam	19%
Vellore	5%
Chennai	11%
Thiruvanamalai	12%
Thiruvallur	10%

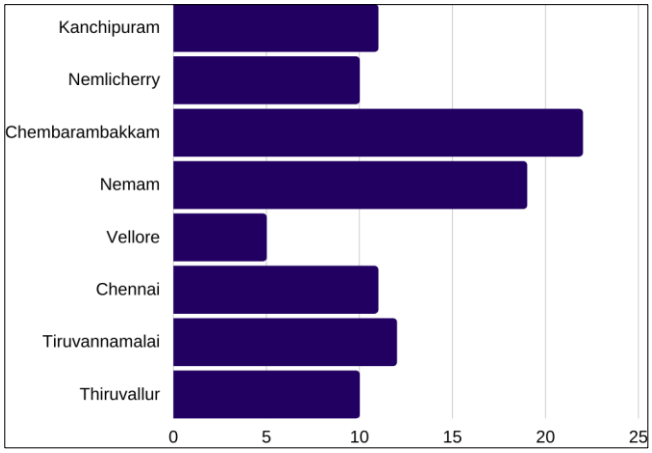


Fig 3: Geographical areas from which the mother comes.

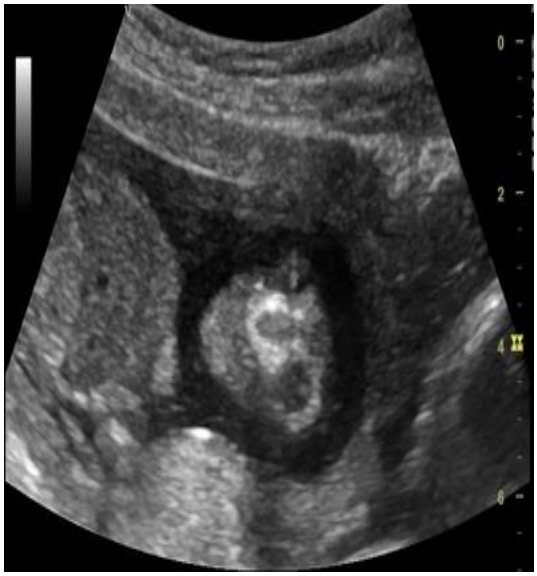
Mothers from remote areas of Kanchipuram (11%), Nemlicherry (10%), Chembarambakkam (22%), Nemam (19%), Vellore (5%), Chennai (11%), Tiruvannamalai (12%), Thiruvallur (10%).

Table 4: Anomalies seen in the baby

CNS	50%
CVS	24%
GI Tract	9%
Renal	7%
Cleft LIP Cleft Palate	10%

Anomalies of CNS (50%), CVS (24%), GI tract (9 %), Renal (7%), Cleft lip and cleft palate (10%)

Fig 4



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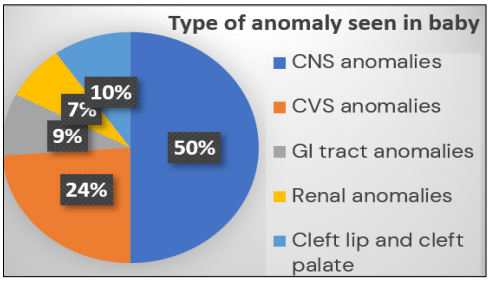

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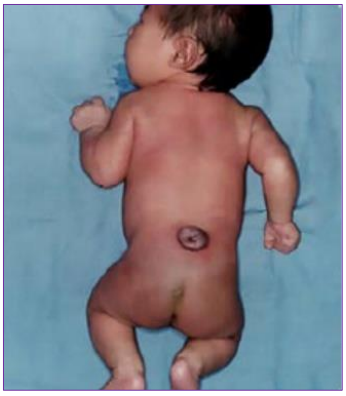

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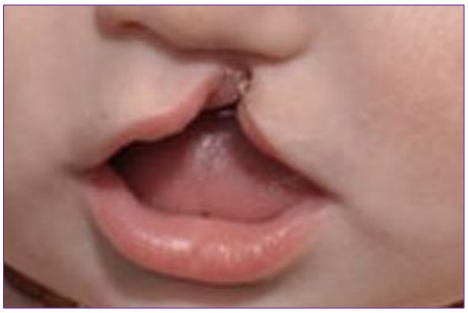

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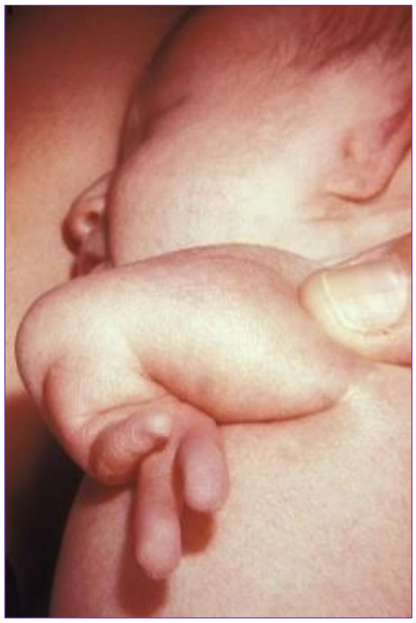

Fig 9

Among the 198 foetus with congenital anomalies 119 (60%) were defects related to CNS and cleft lip cleft palate. Out of the 119, 82 of them had direct maternal or paternal exposure to pesticides and insecticides or they had indirect exposure by living near agricultural lands. And only 11 foetus with no exposure to pesticides were affected with CNS and orofacial anomalies. Statistical analysis shows that either parents with direct exposure to pesticides and insecticides or they had indirect exposure by living near agricultural lands have foetus with congenital anomalies that affect the CNS or have cleft lip cleft palate. The chi square statistic is 37.7037. The p- value is <0.00001. Significant at $p<0.05$.

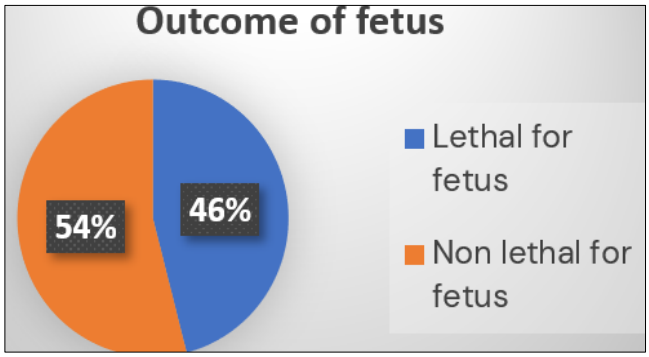

Fig 10

Outcome of Anomalies

Most of our patients came to our hospital with outside scan report showing anomalies for second opinion. Our institution provides multi disciplinary approach by obstetrician, neonatologist, paediatric surgeon and radiologist and counselling was done. Lethal defects were terminated after getting consent from patients. Diaphragmatichernia, cleft lip cleft palate heart anomalies and renal anomalies were properly managed.

Outcome for foetus was lethal in (46%) cases and non lethal in (54%) cases.

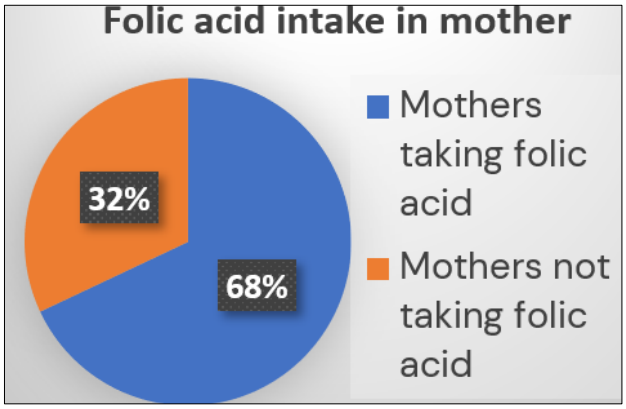

Fig 11

42% not taking folic acid, 68% taking folic acid.
Our study found that others were not aware of folic acid intake periconceptionally and socioeconomic condition plays major role.

Discussion

In this study it was found that the prevalence of foetal anomalies is present in mothers who have nutritional deficiency and anaemia and mostly affecting women who were unaware of the consumption of folic acid tablets from the perconceptioptional period. In another research supplementation with IFA before the time of conception reduces the risk of CMs, and it is generally recommended that women planning to become pregnant take a daily supplement [8, 20]. Dietary supplementation with folic acid around the time of conception has long been known to reduce the risk of NTD in the offspring [21].
The prevalence of congenital anomalies in the low risk group was 22% higher incidence has been noted among the famers from the remote areas like nemilicherry and chembarambakkam hence further studies to find out whether insecticide may play a role is to be done. Research shows that the paternal and maternal exposure to pesticides and insecticides among the farmers had prevalence of congenital anomalies like NTD and orofacial defects in the foetus [28].
Maternal age of >30years had 35% of anomalies where as maternal age of <30 years had 65% of the anomalies. In another research conducted by *ajao et al* young mothers less than 20 years had babies with congenital anomalies than mothers in the age group of 21-35 years and in mothers older than 35 years of age 52% of them had babies with congenital anomalies [7].
Anomalies of CNS (50%), CVS (24%), GI tract (9%), Renal (7%), Cleft lip and cleft palate (10%), Outcome for foetus was lethal in (46%) cases and non lethal in (54%) cases. Results are found to be similar to our study in Baht BV *et al* (10). some authors like Verma *et al* previously found predominance of central nervous system malformation in India Studies by Swain *et al*, Datta *et al*, Khanna *et al*, Taksande A *et al*, Anand JS *et al* have shown that incidence of Central nervous system and musculoskeletal system anomalies are the predominant anomalies noted in accordance with our study findings [12, 9, 13-16].
In other studies most of the malformed stillbirths were cases with cardiovascular congenital anomalies and limb anomalies including polydactyly and abnormal palmar crease [22] Libyan Arab Jamahiriya [23] and Oman [24], Spain [25], Iran [26] and India [27]. The highest death rate was found in neonates with multiple malformations. This is explained by the fact that multiple malformations prevent a harmonious development of the fetus with subsequent multi-organ failure. This finding is also similar to studies like Charlotte *et al* and Sarkar *et al* which had similar result. [17, 20]. Maternal characteristics may increase risk, and screening results should be used to offer appropriate care, according to risk. This may include screening for young or advanced maternal age, as well as screening for use of alcohol, tobacco or other risks. Ultrasound is used to screen for Down syndrome and major structural abnormalities during the first trimester, and for foetal anomalies during the second trimester. Maternal blood can be screened for placental markers to aid in prediction of risk of chromosomal abnormalities or neural tube defects, or for free foetal DNA to screen for many chromosomal abnormalities. Diagnostic tests such as chorionic villus sampling and amniocentesis can be used to diagnose chromosomal abnormalities and infections in women at high risk [1]. This will help us reduce a lot of risk.

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