

Analysis of high risk factors for congenital anomalies amongst women attending ANC care at tertiary centre

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Abstract

Aim: To evaluate the risk factors associated with congenital anomalies. To evaluate the association of different risk factors and the anatomical systems. affected. To analyze the outcome of pregnancies diagnosed with fetal congenital anomalies.

Key Words: congenital anomaly.

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INTRODUCTION

Human reproduction is a complex process, which can be affected in many phases by both host and environmental factors. The conception of an embryo involves the fertilization of the ovum by a spermatozoon. If ovum and/or spermatozoon is defective, the fetus could present with still birth or congenital anomalies may be detected at birth or later in life. Another scenario is that the embryo is conceived by a normal ovum and spermatozoon, but in the process of development in the uterus it is exposed to the agent that may be harmful to the different organ system. Depending upon the type of agents and at which stage of the developmental process of the organs formation the exposure occurs, different congenital anomalies may result.¹ Congenital anomalies represent

defect in morphogenesis during early fetal life, can be defined as structural or functional anomalies that occur during intrauterine life and can be identified prenatally, at birth or later in life² Now a days with the availability of 3D and 4 D ultrasound, chorion biopsy, amniocentesis, blood markers etc. there is increased prevalence of detection of congenital anomalies and so the risk factors for their causation can be well studied.³ Every pregnant women is at a risk of carrying a fetus with a congenital anomalies hence the screening for congenital anomalies should be integral part of prenatal care.⁴ Detection of congenital anomalies and their risk factors has become a new goal of prenatal care for the Obstetrician. Being a tertiary care center and the availability of super speciality unit (paediatric surgery, paediatric cardiac surgery) and advanced neonatal care many women with fetal congenital anomalies are referred to us hence the we get an opportunity to study the risk factors for the congenital anomalies.

MATERIAL AND METHODS

This is prospective observational study of all ANC patients diagnosed with fetal congenital anomalies coming to OPD or admitted in MGM Medical College and Hospital, during the period from October 2015 to October 2017, were included in the study.

OBSERVATIONS AND RESULTS

Total number of ANC patients admitted to our hospital during my study period are 7603. Among which I have studied 135 anomalous patients.

Table 1: Distribution of congenital anomalies with Age of mother (N=7603)

Age	Non Anomalous (7468)		Anomalous (135)	
	Number	%	Number	%
<19 (n=645)	630	97.67%	15	2.32%
19 to 35 years (n=6190)	6072	98.09%	118	1.90%
>35 years (n=75)	73	97.33%	2	2.66%

Chi square value is 0.0737, and P value is 0.692

No significant association of maternal age is observed with occurrence of congenital anomalies.

Table 2: Distribution of congenital anomalies with Religion (7603)

Religion	Non Anomalous		Anomalous (135)	
	Number	%	Number	%
Hindu (5882)	5784	98.33%	98	1.66%
Muslim (1680)	1657	98.63%	23	1.36%
Others (41)	27	65.85	14	34.14%

Chi sq. value is 248 and P value is 0.0001

Noting of the religion in non anomalous population other than Hindu and Muslim was inadequate.

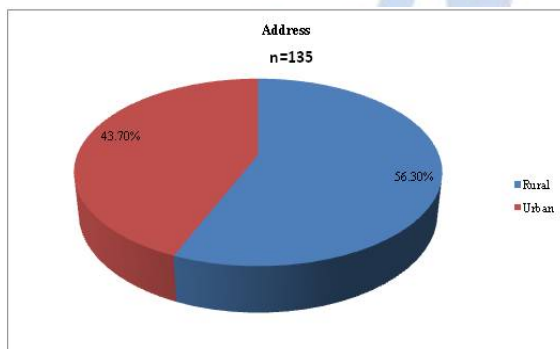


Figure 1: Distribution of congenital anomalies with Address

Figure 1: Pie diagram showing Distribution of congenital anomalies with Address In spite of being located in urban area, 56.3% of subject population was from rural area as our hospital is a tertiary referral center.

Table 3: Distribution of congenital anomalies with patient's occupation

Patient's occupation	Number (N=135)	%
Housewife	107	79.9%
Farming	12	8.8%
Labourer	9	6.6%
Others	7	5.18%

Only 8.8% of ladies exposed to hazardous material (chemical fertilisers and insecticides), which is a very less number as we are having inadequate history of duration and amount of exposure.

Table 4: Distribution of congenital anomalies with antenatal Care

ANC	Number (N=135)	%
Adequate antenatal care	49	36.29%
Inadequate antenatal care	86	63.70%

Percentage of anomalies is more among inadequate antenatal care group as it indicates lack of awareness regarding investigations and treatment

Table 5: Previous Pregnancy Outcome

Sr. No.		Number	%
1	Primigravida	54	40%
2	Previous normal babies	29	20.7%
3	Previous spontaneous abortion	1 st trimester: 26 2 nd trimester: 3	18.5%
4	Previous Missed abortion	1 st trimester: 11 2 nd trimester: 7	13.3%
5	Previous MTP for fatal anomaly or other	7	5.2%

Though the patient is low risk the anomaly may seen. Low risk population also be screened as early as possible.

Table 6: Gestational age at which anomaly was detected in the study subjects

	Number	%
GA at <20 weeks	84	62.2%
which >20 weeks	44	32.6%
anomaly Detected Postnatally	7	5.2%

In considerable number of patients anomalies were detected more than 20 weeks, it create non-productive burden on mother.

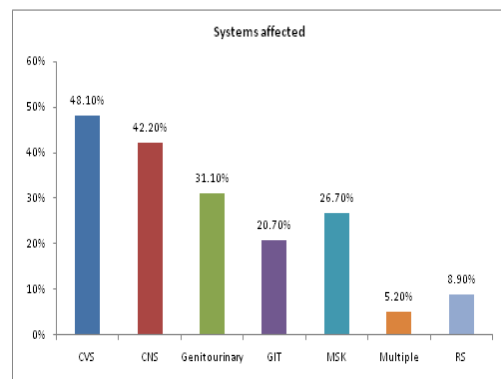


Figure 2: System affected among the subjects

Figure 2: Bar diagram showing Systems affected among subjects Cardiovascular system is most commonly affected system.

Table 10: Risk factors among subjects

	Present		Absent	
	Number	Percentage	Number	Percentage
Environmental Exposure	32	23.7%	103	76.3%
Consanguineous Marriage	51	37.8%	84	62.2%
H/O of fever in first trimester	86	63.7%	49	36.3%
Family History	8	5.9%	127	94.1%
Tobacco Exposure	35	25.9%	100	74.1%
FA/MV not taken	61	54.8%	74	45.2%
UTI in first trimester	83	61.5%	52	38.5%
Vaginal infection	82	60.7%	53	39.3%
Mixed Diet	Present		106	78.5%
	Absent		29	21.5%

Every anomaly has a multiple risk factor, no single risk factor was found. Infection seen to be most common risk factor among the history.

Table 20: Investigations results among subjects

Risk Factor		Number	%
Thyroid disorder	Present	40	29.6%
	Absent	95	70.4%
OGCT	Abnormal	10	7.4%
	Normal	125	92.6%
Anemia	Absent	70	51.9%
	Present	65	48.1%
Urine microscopy	Abnormal	45	33.3%
	Normal	90	66.7%

Table 26: Baby Outcome in the study

Baby out come		Number	Percentage
Aborted	Spontaneous abortion	4	59.3%
	Missed abortion	3	2.2%
	MTP	76	56.2%
	IUFD	3	2.2%
	FSB	2	1.5%
Delivered	Died after delivery	19	14.1%
	Needs correctable surgeries and follow up (early intervention)	9	6.7%
	Delivered (live)	19	14.1%
	Late intervention and F/U		
Total		135	100.0%

80% of the anomalies having poor out come

DISCUSSION

In this study, we have studied the presence or absence of risk factors in the study population i.e. the women having diagnosed congenital anomalies and the outcome of the pregnancy in them. we have also studied the association of anomalies with the demographic factors like age, religion, occupation and residence. In Indian communities we have trend of early marriages hence most common reproductive age group comprises women of 20 to 35 years. Desai and Desai (2007) done a study where the incidence of congenital anomalies in this age group is 73%⁵. Less number of subjects above 35 years were found in our study as in our community usually the family gets completed before 35 years so these results

cannot be considered as representative of whole society. In our study, association of congenital anomalies with religion is statistically significant. Religion become significant as it belongs to trends of consanguinity and is more significant in the group (others) which included closely knit communities like Parasi with more number of congenital anomalies seen in studies done by sundip Hemant Chormode at Kallam.⁶ The distribution of congenital anomalies with the address of the patient is studied and found that large population subjects (56.3%) belonged to rural area. This is because ours is a tertiary care center, with availability of super speciality (paediatric surgery and paediatric cardiac surgery) and multispeciality services and also advanced

ultrasonography machine to diagnose the anomalies, so we have lots of referrals from the surrounding rural areas. In our study out of 135 cases, 79.9% were housewives, 8.8% were doing farming, 6.6% were labourer and 5.18 were others. Occupation plays a important role with the occurrence of congenital anomalies due to work stress (physical and mental), occupational exposure to hazardous materials and importance of socioeconomic status of the women. House wives may not be aware about the importance of antenatal screening for anomalous baby as they may not get chance to receive information from external sources and antenatal supplementations of folic acid, iron and other vitamins. Hence we have to reach the pregnant women and their families, for awareness regarding importance of investigations and treatment. In our study, 63.7% of subjects received inadequate antenatal care and their is higher incidence of anomalies among them. This is similar to study done by Mahadevan and Bhatt (2005)⁷ When the previous pregnancy outcome were studied we found that in low risk group i.e. group of primigravida and previous normal babies incidence of anomalies is 60.7%.which indicates that the women with low risk for anomalies also need to be screened extensively for anomalous babies along with the high risk group (39.7%). Hence every pregnancy needs to be considered as a risk factor for fetal congenital anomalies. A. G. Tomatir an *et al* (2009)⁸ and Desai and Desai⁵ in their studies have found that majority of anomalies either in primigravidas or secondgravida. The gestational age at which anomaly is detected, is very important in India because of the constraints of the MTP laws, as pregnancy termination is possible only upto 20 weeks of gestation. Anomalies detected after 20 weeks create ethical, social and management dilemmas. It affects the physical, mental and social health of the patient and family.

Risk factors among the subjects Environmental exposure: In our study the 23.7% of the subjects are having environmental exposure in terms of smoke, mobile network waves, drug exposure, asbestos, cotton, pesticides, fertilizers.

We have tried to study the exposures in relation to time period for exposure but because of inadequacy of the history, no association could be found out.

Consanguineous Marriages: Incidence of congenital anomalies is more with second degree consanguineous marriages. No case was found having first degree consanguineous marriage. In our study 37.8% were having consanguineous marriages. Our findings similar to B. Mahadevan *et al* (2005)⁷

Fever in first trimester: Fever in first trimester is associated with congenital anomalies due to embryonic

damage caused by cell death due to fever, membrane disruption and placental infarction.

In our study 63.7% were having fever in first trimester.

Family history: In our study 5.9% of the population having positive family history of congenital anomalies and 94% were having no association with congenital anomalies, hence in our study, the occurrence of congenital anomalies is not having history of inheritance, this could be because of difference in reporting and duration of study. Skervaen *et al* (1997)⁹ noted the risk of positive family history with congenital anomalies is statistically significant.

Tobacco exposure: In our study, we have considered the tobacco exposure in any form, including passive smoking as tobacco exposure ultimately increase the serum nicotine levels.⁹ In our study 25.9% of the cases were having tobacco exposure. In my study no subject was exposed to alcohol consumption.

Multivitamin and folic acid supplementation during first trimester and preconception period: In our study 54.8% of the subjects were not taking multivitamin and folic acid during antenatal and pre conceptional period and though 45.2% of the subjects were taking it regularly still the incidence of congenital anomalies were noted. Tolarova and *et al* (1982)¹¹ reported a protective effect of multi vitamin and folic acid together during the preconception period for the prevention of congenital anomalies.

UTI in first trimester: In our study 61.5% of the subjects were having UTI in first trimester. Study done by Banhidy F, *et al* (2006)¹¹ found that UTI is associated with atrial septal defects.¹²

Vaginal infections: In our study, 60.7% of the subjects were having vaginal infections in the first trimester. Among those with vaginal infections, 73.2% had developed lethal grade, 20.7% had minor grade and 6.1% had major with correctable grade. Laschieve and *et al* found that vaginal infection are associated with poor perinatal outcome in the form of congenital anomalies (1994)¹²

Mixed Diet: In our study, 78.5% of the population were having mixed diet, and only significant association of diet was found with Respiratory system. Thus there is a future scope for further studies, for association of congenital anomalies with mixed diet.

Investigations among subjects: In our study, 29.6% of the population were having thyroid disorders (hypothyroidism and hyperthyroidism), Adam wolf berg and David Nagey in 1994 and 1999, studied the association of thyroid disorders and occurrence congenital anomalies.¹³ In our study, 7.4% of the population had deranged OGCT, thereby making a deranged OGCT not a significant risk factor for congenital anomalies. In our

study, 48.1% of the subjects were anemic, which indicates that malnutrition is still common in our region. There was no significant association between urine microscopy and grade of anomaly. Serum folic acid levels were studied among all the subjects and their distribution among subjects who have taken folic acid and who have not taken it in preconceptional and antenatal period. Among those who have are regularly taking folic acid 81.39% of the subjects were having normal level of folic acid and those with abnormal levels of folic acid have not received any supplementation during either preconception or early months of pregnancy. In spite of anomalies 20.7% (19+9=28) of the subjects were benefited by interventions because they were referred to us before delivery. Remaining 80% of the anomalies resulted in poor outcome.

Limitations of the study: As we have included only 135 subject samples, the results of this study could not be generalized for the population, in the form of identified risk factors. Results of the relationships of the religion and occurrence of anomalies may have biased as the data about the other religions was not complete. The study subjects included in our study were mainly the ones referred to us either for termination of pregnancy or for tertiary care management of anomalous babies, there are high chances that we have missed the ones who had minor fetal anomalies or have aborted the anomalous babies. I could not study Genetic factor as a risk factors among the development congenital anomalies because of financial constraints.

SUMMARY AND CONCLUSION

Irrespective of the present and absent of any risk factor for fetal congenital anomalies all pregnancies should be screened positively for the detection of anomalies. There is a multifactorial origin for fetal anomalies. There is still a scope for improvement in the detection of anomalies by the imaging specialist and for improvement in the awareness about importance of anomaly scan in the society. Assessments of fetal outcomes in congenital

anomalies requires more wider and population based studies.

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