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Research Article

STUDY OF INCIDENCES OF CONGENITAL ANOM ALIES IN BABIES OF DIABETIC MOTHERS

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ABSTRACT
This is study was carried out on diabetic mothers who have given birth to anomalous babies. The objective of the present study was to know the various types of anomalies & their percentages of incidences. This study was done in various clinical departments at the Teaching hospital of Sri Raja Rajeswari Medical College, Bangalore. This study was done during 2009-2011. About 1245 mothers were screened for the presence of any anomalies during 2009-2011. Out of them 129 mothers were diabetic and they gave birth to 78 babies with anomalies. This study was later compared and correlated with available literature. This study will be profound clinical importance for physician, genetists, and community medicine. It is physician who controls diabetes, community medicine who advice the community about the anomalies and its relation to diabetes

Key Words: *Diabetes Malletus, Cosangunity, Anomalies, Genetists, Maternal Diseases, Hyperglycemia, Congenital Malformations*

INTRODUCTION
The offspring of mother suffering from maternal systemic diseases are always more prone for anomalies. The incidence of birth defects is two or three more in poorly controlled diabetes with persisting hyperglycemia and ketosis during embryogenesis (Reece and Eriksson, 1996). There is no specific diabetic syndrome but babies born diabetic mothers are always large –Macrosomia –Big Baby. The common birth defects that occurs are holoprosencephaly (Failure of forebrain to divide into two cerebral hemisphere, Meroencephaly (Partial absence of brain,) sacral agenesis, vertebral anomalies, congenital cardiac defects and defects of limbs (Behrman *et al.*, 1996). Those women who are untreated and those who are homozygous Penylalanine hydroxylase deficiency known as Phenylketonuria along with hyper phenyl alaninemia are more prone to get children with microcephaly, defects in the heart, mental retardation, and Intra Uterine Growth Retardation (IUGR). These anomalies in PKU MOTHERS can be prevented if she takes PHENYLALANINE restricted diet (Levy and Ghavami, 1996).

MATERIALS AND METHODS
This is study done in diabetic mothers associated with congenital anomalies screened in the out patients departments at Rajarajeswari Medical College Teaching Hospital, Bangalore..About 758 diabetic mothers (non gestational diabetes) were screened for the presence of any anomalies during 2009-2011. Out of them, 78 mothers (1.02%) gave birth to babies with anomalies involving various systems. In some babies there was single anomalies while in others, there were multiple anomalies Careful history was taken in all mothers regarding antenatal history like family history, drug intake during first trimester, personal history, past history, obstetrics history, and similar history in the past. Careful investigations were done for sugar, and ketoacidosis. Later they were classified under different systems and their percentages were calculated. This study was later compared and correlated with available literatures.

RESULTS

78 babies were suffering from anomalies involving one or more systems. Out of them, 67 babies were suffering from single anomalies then they were classified under different systems and tabulated.

Table 1: Showing various types anomalies involving different systems namely: Cardiovascular system, Musculo skeletal system, Gastro intestinal system, Dermatological system Ophthalmological systems, Otonasolaryngology, Renal system, Genetic anomalies Facial anomalies, vascular malformation

S.No	Systems involved	Number	Percentages
1.	Cardiovascular system	12	15.38%
2.	Musculo skeletal system	14	17.94%
3	Gastrointestinal Anomalies	17	21.79%
4	Dermatological system	05	6.41%%
5	Ophthalmological systems	02	2.56%
6	Otonasolaryngology	04	5.12%
7	Renal system	01	1.28%
8	Genetic anomalies	02	2.56%
9	Facial anomalies	06	7.69%
10	Anomalies of genital system	03	3.84%
11	Vascular malformation.	01	1.28%
	TOTAL	67	

From the above table1, it is observed that anomalies of Gastro intestinal system constitute higher percentages of incidences (21.79%) followed by Musculo skeletal system (17.94%), Cardiovascular system (15.38%), Facial anomalies (7.69%). while renal systems and vascular malformation (1.28%) constituted the least percentages of incidences.

Table 2: Showing the incidences of number of anomalies & their percentages of incidences of different age groups :

S.No	Age groups	Number of Anomalies	Percentages
1.	21-25 years	14	17.94%
2.	26-30 years	20	25.64%
3	31-35 years	25	32.05%
4	35-40years	09	11.53%
5	Above 40 years	10	12.82%
	TOTAL	78	

From the above table-2, it observed that higher percentages (32.05%) of anomalies are seen between the age groups of 31-35 years of age followed by the age groups of 26-30 years of age (25.64%). Least percentages of incidences are seen in mother's age groups of 35-40 years of age.

Table 3: Showing the number and their percentages of incidences of combination of Anomalies:

S.No	Combination of anomalies	Number of incidences	Their percentages of incidences
	Cardiovascular system with neural tube defects	02 cases	2.56%
2	Otonasolaryngology with Genetic anomalies	01 cases	1.28%
3	Dermatological system with Musculo skeletal system	01 cases	1.28%
4	Anomalies of genital system with neural tube defects	03 cases	3.84%
5	Renal system with. Gastrointestinal system	02 cases	2.56%
6	Genetic anomalies with Cardiovascular system	01 cases	1.28%
7	Ophthalmological systems with Musculo skeletal system	01 cases	1.28%
	Total	11 cases	

Tables shows percentages of incidences in involving more than one system Among the combinations of anomalies, it was found that higher incidences of anomalies were seen in combinations of anomalies of genital system with neural tube defects(3.84%) followed by cardiovascular system with neural tube defects(2.56%) and rest single cases were seen in other combinations of cases(1.28%) .

DISCUSSION

Teratology is a study of aetiology, mechanism and different patterns of abnormal development giving rise to congenital anomalies. It is hormonal factors like disorders of metabolism and disorders of endocrines like diabetes in mothers or usage of synthetic hormones like cortisone, progesterone or oestrogens that give rise to teratogenic effect on developing embryo. It is during second week of development i.e., during bilaminar stage these teratogens, have all or none effect. It is during these two weeks there is high rate of lethal effect on the developing embryo. They may cause various defects like structural, functional, metabolic, behavioural defects on the embryo (Arushi and Indu, 2012). Maternal diabetes has given rise to various birth defects namely cardiac and neural tube defects and other anomalies (Sadler, 2009). An epidemiological analysis was done in diabetic mothers during their pregnancy period. They analysed the relationship between nongestational maternal diabetes and various groups of congenital defects Anomalous babies were made into two groups babies of non gestational diabetic mothers with that of nondiabetic women. After analysis was done, they found out very characteristic group of congenital defects were seen in children of diabetic women. The characteristic congenital anomalies defects were suffering from caudal dysgenesis complex Also suffered from multiple congenital anomalies (MCA) along with congenital cardiac defects. These anomalies were frequently seen than those of non diabetic women. The inference drawn from this study is blastogenic anomalies is more in babies of diabetic mothers (Friaz, 1994). Incidence of cardiovascular defects is 6-8% live births (Hoffman, 2002). In most cases aetiology is unknown, but it is believed to be some have genetic and environmental aetiology.1% is caused by maternal dieases (Buskins *et al.,* 1995). Maternal diabetes is known cause malformation and has teratogenic effect and incidence of anomalies that has been reported is 1.7 to 4% (Pedersen *et al.,*

1964; Mitchell *et al.,* 1971; Rowland *et al.,* 1973; Mills *et al.,* 1988; Ferencz *et al.,* 1990; Becerra *et al.,* 1990).

A six year study was done between 1995-2000 which had 192618 live births as study populations. They had both diabetic as well as non diabetic mothers. There were 1417 babies with cardiovascular abnormalities out of 192009 babies born to non diabetic mothers before completion of one year with a prevalence rate of 0.74%.About 609 babies were born to diabetic mothers which has 22 cardiovascular anomalies with prevalence rate 3.6%.The odd ratio for cardiovascular abnormalities in non diabetic mothers with that of diabetic mother was 5.0 (Wren *et al.,* 2003).

Present Study

There were 78 anomalies in the present study which has been divided under 11 systems namely, cardiovascular system, Musculo skeletal system, Gastro intestinal system, Dermatological system Ophthalmological systems, Otonasolaryngology Renal system, Genetic anomalies Facial anomalies, vascular malformation. It has also been observed that anomalies belonging to Gastro intestinal system has constituted higher percentages of incidences (23.07%) followed by Musculo skeletal system (19.23%), Cardiovascular system (15.38%), Facial anomalies (8.97%). While renal systems and vascular malformation (2.56%) has constituted the least percentages of incidences. Out of them 67 anomalous babies were suffering from single anomalies and rest ten babies suffered from combinations of anomalies Among combinations of anomalies, it was found that higher incidences of anomalies were seen in combinations of anomalies of genital system with neural tube defects(3.84%) followed by cardiovascular system with neural tube defects(2 .56%) constituted next higher percentages of incidences & least percentages were seen in combinations of ophthalmological systems with Musculo skeletal system(1.28%).

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