INCIDENCE OF CONGENITAL ANOMALIES: A HOSPITAL BASED STUDY

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During 18 months' period (January 1994-June 1995), 64 congenitally malformed babies were delivered in Obst/Gyn unit of Women and Children Hospital Abbottabad. Incidence was 2.9%. Neural tube defects were 42 (65.62%), hydrocephalus 16 (25%), cleft lip and cleft palate 3 (4.68%), amelia one (1.56%), polydactyly one (1.56%) & anophthalmia one (1.56%). 13 (20.3%) mothers were primigravidas, 29 (45.31%) were multiparas and 22 (34.37%) were grand multiparas. All of them belonged to poor socio-economic class. 9 were booked and 55 (85.93%) were un booked. There was no history of X-ray exposure, drugs intake, high grade fever or congenitally malformed babies. 4 (6.25%) mothers of babies with neural tube defects were known diabetics.

INTRODUCTION

Congenital malformations are defined as gross structural defects present at birth. In a worldwide survey on the incidence of congenital malformations comprising about 20 million births \ it was found that based on birth certificates, the percentage of congenital malformations was 0.83%; according to hospital and clinic records, it was 1.26%. The figures of incidence of congenital malformations vary greatly. In studies of official records and births certificates, the percentage of abnormalities varied from 0.75-1,98% [2], These estimates were found to be rather low when compared with data from hospital and clinic birth records in which a variation of 1.43 - 3.3 % was noted. It is probable that 2 - 3 % of all live- birth infants show one or more significant congenital malformations at birth.

Despite the rapid development of the field of teratology, our knowledge of congenital malformations in humans has increased relatively little. At present, it is estimated that 10% of all malformations are caused by environmental factors and another 10% by genetic and chromosomal factors.

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Gregg was the first to suggest that German measles affecting patients in early pregnancy could lead to congenital malformations in offspring. Only three viral diseases, rubella, cytomegalovirus and herpes simplex virus have been positively identified as causing malformations. Maternal infection with *Toxoplasma gondii* was shown to produce hydrocephalus or mental retardation. Syphilis may lead to congenital deafness and mental retardation.

Teratogenic effect of X-irradiation has been known for many years, and it is recognized that microcephaly, skull defects, spina bifida, blindness and cleft palate may result from treating pregnant women with large doses of X-rays [4]. Studies of the offspring of Japanese women pregnant at the time of atomic bomb explosion over Hiroshima and Nagasaki revealed that among the survivors, 28% aborted; 25% of the surviving children had abnormalities of CNS such as microcephaly and mental retardation. Relation of chemical agents like thalidomide to amelia or meromelia, anti-epileptics (phenytoin sodium and trimethadone) to cleft lip and cleft palate, anti-coagulants (warfarin) to chondrodysplasia and microcephaly are well known.

A variety of malformations have been observed with maternal diabetes.

Common association of neural tube defects with dietary deficiency of folic acid and zinc is well known.

MATERIALS AND METHODS

From January 1994 to June 1995, there were a total of 2,200 deliveries in unit A of the Department of Obstetrics and Gynaecology,

Women and Children Hospital (teaching affiliate of Ayub Medical College), Abbottabad.

This is a prospective study of all cases of congenitally malformed babies delivered in this unit during these 18 months.

Case records of all these patients were studied. Age, parity, booking status, socio-economic status, education, use of drugs, X-ray exposure, history of previous congenital malformations and family history were recorded.

RESULTS & CONCLUSIONS

A total of 64 congenitally malformed babies were delivered during the study period. Out of these 64 congenitally malformed babies, the highest incidence was of neural tube defects, with 42 (65.62%) cases (i.e. anencephalic-23, meningomyelocoele-1, anencephaly with spina bifida-6 and spina bifida alone-2 cases).

Hydrocephalics were 16 (25%), Cleft lip and Cleft palate 3 (4.68%), Amelia, Polydactyly, Anophthalmia 1 (1.56%) each (Table-I).

TABLE -1
TYPES OF CONGENITAL ABNORMALITIES

TYPE	NO. OF CASES	PERCENTAGE
NTD	42	65.62
HYDROCEPHALY	16	25.0
CLEFT LIP AND CLEFT PALATE	03	4.68
AMELIA	01	1.56
POLYDACTYLY	01	1.56
ANOPHTHALMIA	01	1.56

13 (20.3%) mothers were primigravidas, 29 (45.31%) were multiparas and 22 (34.37%) were grand multiparas (Table-II).

TABLE - II
DISTRIBUTION ACCORDING TO PARITY

PARITY	NO. OF CASES	PERCENTAGE
PRIMIPARA	13	20.3
MULTIPARA	29	45.31
GRAND MULTIPARA	22	34.37

Average maternal age was 37 years. It ranged from 21 years to 46 years (Table-III).

TABLE - III
MATERNAL AGE GROUP DISTRIBUTION

MATERNAL AGE	NO. OF CASES	PERCENTAGE
20 - 30 YEARS	23	35.93
30 - 40 YEARS	31	48.43
> 40 YEARS	10	15.62

All patients belonged to poor socio-economic class. 9 were booked for hospital delivery and remaining 55 were unbooked (Table-TV).

TABLE - IV
HOSPITAL CONFINEMENT: BOOKING STATUS

BOOKING STATUS	NO. OF CASES	PERCENTAGE
BOOKED	09	14.06
UNBOOKED	55	85.93

DISCUSSION

Although a large number of birth defects have been described and attributed to specific factors, little is known about how an agent actually produces a defect or how a defect may be prevented or reversed. Therefore, the medical approach to this problem prevention ranges from early detection during pregnancy and therapeutic termination to postnatal repair of defects.

In practice NTDs are the most common abnormalities. In some regions, incidence may be as high as 4 - 5 per 1000 births. For NTDs folic acid, zinc and multivitamin deficits have been implicated [5]. The results of Medical Research Council's randomized trial of folic acid and other vitamin supplementation showed that taking extra folic acid around the time of conception can prevent a large proportion of NTDs [6].

In our study, the incidence of congenital malformations is 2.9%. Incidence of NTDs is more common in developing countries, as it is in our study (42 cases out of total 64 congenitally malformed babies). Again the incidence was very low among the booked patients who are given folic acid, multivitamin, iron and calcium from early pregnancy.

The role of zinc in the development of embryo has been demonstrated in rodents [7] and within *vitro* embryo cultures [8]. hi animals, deficiency of zinc has been shown to cause defects in the central nervous system [9]. Zinc is also of interest because of its reported interaction with folate in animals. There is a suggestion of an

antagonistic effect in which modest increases in folate intake can adversely affect zinc metabolism [10].

Studies have shown that women who gave birth to babies with neural tube defects have lower intracellular folic acid [11].

The Medical Research Council Vitamin Study Group in a randomized double blind trial established a specific role for folate in the prevention of NTD recurrence [7].

Early detection of congenital malformations via maternal serum alpha foetoproteins, chorionic villous biopsy, and ultrasound techniques with subsequent termination of those embryos found to be severely malformed can greatly reduce the incidence of congenitally malformed babies born at birth leading to severe social and psychological problems among the affected families.

RECOMMENDATIONS:

Recommendations for the prevention of congenital malformations are:

1. Improvement of socio-economic conditions and nutritional status of the women in reproductive age group.
2. Mass education and public awareness.
3. Iron, multivitamin, folic acid, zinc and calcium supplements should be given to all pregnant women starting from the first trimester.
4. X-ray exposure should be avoided during pregnancy.
5. Every doctor should enquire about pregnancy before prescribing any drug.

Inter-family marriages should be discouraged.

REFERENCES

1. Gentry JT, Parkhurst E & Bulin GV: Epidemiological study on congenital malformations in New York state. Am J Public Health 49:497, 1959
2. Stevenson SS, Worcester J & Rice RG. Six hundred and seventy-seven congenitally malformed infants and associated gestational characteristics. Paediatrics 6: 37, 1950
3. Book JA & Fraccaro M: Research on congenital malformations. Etud Neonatal 5:39, 1956.
4. Gregg NM: Congenital cataract following German measles in mothers. Trans Ophthalmol Soc Aust 3:35, 1984
5. Milne DB et al (1984). Effect of oral folic acid supplements on zinc, copper and iron absorption and excretion. Am J Clin Nutr 39: 535-539
6. Canton M & Cremin FM (1990). The effect of dietary zinc depletion and repletion on rats. Br J Nutr 64:201-209.
7. MRC Vitamin Study Research Group (1991). Prevention of Neural Tube Defects. Lancet 338, 131-137
8. Hurley LS (1981). Teratogenic aspect of manganese, zinc and copper nutrition. Physiol Rev 61: 249-295
9. Mieden GD et al (1986). Effects of whole rat embryos culture on serum zinc and copper deficit rats. J Nutr 116:2424-2431
10. Smithells RW, Sheppard S & Wild J (1989). Prevention of neural tube defects. Lancet ii, 498- 499
11. McIntosh R et al. Incidence of congenital malformations. A study of 5964 pregnancies. Paediatrics 14:505, 1954