

One year review study of congenital anatomical malformation at birth in Maternity Hospital (Prasutigriha), Thapathali, Kathmandu

Malla BK

Senior Consultant, Department of Anatomy, Duwakot, Kathmandu Medical College

Early intrauterine period during 3rd - 8th weeks of gestation is the vital period of life for the normal development of organs and organ system or organogenesis. Congenital malformation or defects are structural, functional and metabolic disorders at birth and the exact cause of birth defects in 40-60% are unknown. However, factors like genetic, environmental, teratogenic and infectious agents play important role for the origin of malformations during the most sensitive period of Embryogenesis. The congenital malformation accounts for the leading cause of neonatal deaths and stillbirths. However, detailed information about the incidence, type, anatomical parts or organs involved in congenital malformation are not available in Nepal. Hence the present study was conducted to find out the incidence, type and congenital malformations among newborns in relation to normal anatomical structure at birth.

Objectives

The main objectives of the present review study is to find out the incidence, magnitude of congenital malformation and to know the specific involvement of anatomical structures among babies born at Maternity Hospital, Thapathali, Nepal

Methodology

Detailed data about sex, maturity, weight and congenital defects of all live births including twins and stillbirths with malformation, delivered at Maternity Hospital (Prasuti Griha) during one year period (2061) were collected. All relevant information about the congenital defects of these newborns was collected from the main Registration book at the labour room. These defects either major, minor, single, multiple were categorized accordingly to anatomical systems like central nervous, gastrointestinal, cardiovascular, musculoskeletal, genitourinary and others.

Results

Table 1: Deliveries in an year

Total No. of delivery in 1 year	16948
Total No. of Live births "	16601
Male: Female	8923 (53.0%):
Total No. of Twin delivery	161 (0.9%)
Total No. of Premature	375 (2.2%)
Total No. of Still births "	347 (2%)
Male: Female "	160: 187
Total No. of Congenital	75 (0.36%)
Total No. of low birth weight	1724 (10%)

Table 2: Ratio of Live, Still and Twin births with Congenital Malformations:

Types of Births	No of Births
Live	47
Still	14
Twin	14

Table 3: Types of Births

Types of Births	Male	Female
Live	26	21
Still	4	10
Twin	6	8

Correspondence

Dr. Banshi Krishna Malla
Senior Consultant,
Department of Anatomy, Duwakot,
Kathmandu Medical College

Sex ratio with Congenital Malformations

The incidence of congenital malformations among newborn during one year at Maternity Hospital showed as 0.36% among the total live births. The congenital anomaly among the male live births (34.6%) was slightly higher than the female live births (28.1%), whereas, there was increase of congenital malformation among female stillbirths (13.3%) as compared to male (5.3%).

The incidence of congenital anomaly was found higher among the full term live births with low birth weights and significantly higher than the still births.

Table 3: Maturity ratio with Congenital Malformations

Types of Birth	Preterm	Term
Live	12	35
Still	5	9
Twin	10	4

Table 4: Weight ratio with Congenital Malformations:

Types of Birth	< 2.5 Kg	>=2.5 Kg
Live	12	35
Still	5	9
Twin	10	4

Table 5: Defects according to anatomical systems

Anatomical System	Live Birth	Still Birth	Twin Birth
Central Nervous	13	10	7
Musculoskeletal	12	1	1
GI Tract	11	1	1
Genito Urinary	6	2	5
Special Sense Organs	3		
Cardio Vascular	1		
Genetic	1		

Table 6: Congenital Malformations

Anatomical System	Live Birth	Still Birth	Twin Birth	Total
<u>Central Nervous System</u>				30
Hydrocephalous	4	3	1	8
Meningocele	4			4
Meningomyelocele	1			1
Meningomyelocele with Clubfoot	1			1
Anencephaly	1	3	5	9
Hydrocephalus spinabiphydia	1	1		2
Occipitomenigo Encephalocele	1			1
Toxoplasmosis		1	1	2
Meningohydroencephalocele		2		2
<u>Musculoskeletal System</u>				14
Talipes equinivarus	2		1	3
Polydactyle	2			2
Abnormalities in Foot	1			1
Polydactyly	1			1
Muscular Dystrophy		1		1
Webbed/ Syndactyl	1			1
Erb's palsy	2			2
Abnormalities In Hip / Knees	1			1
Abnormalities Knee Joint/Patella	1			1
Brachiocephaly	1			1

Table 6: Congenital Malformations cont....

<u>GI Tract System</u>				13
Cleft lip/ palate	6			6
Cleft lip/ Hare lip	2		1	3
Microgenethia	1			1
Hepatosplenomegaly	2			2
Omphalocele		1		1
<u>Genito Urinary System</u>				13
Undescended testes	1		1	2
Hydrocele	1			1
Hypospadias			1	1
Rudimentary genitalia	1			1
Oligohydramnios / polyhydramnios	3		2	5
Placenta		1		1
Haematoma Labia		1	1	2
<u>Special Sense Organs</u>				3
Undeveloped Ear	1			1
Congenital cataract	1			1
Microphthalmia / Hydrocephalous	1			1
<u>Cardio Vascular System</u>				1
Heart Disease	1			1
<u>Genetic System</u>				1
Down's syndrome	1			1
Sum Total	47	14	14	75

In the present study, the most common anatomical organs involved in congenital malformations were central nervous system (anencephaly, meningocele, meningomyelocele, hydrocephalous and spinabifida), musculoskeletal (talipes equinovarus, polydactyl and syndactyly), GI tract (cleft lip and palate, hepatosplenomegaly), genitourinary systems (undescended testes, microgenitalia) and special sense organs (congenital cataract, undeveloped ear).

Observations and discussion

A preliminary study conducted at Maternity Hospital has estimated that the congenital malformations account for 9.7% of perinatal deaths, 11.06% of early neonatal death and 7.9% of still births. A review study conducted at TU Teaching Hospital showed about 1.3% of babies having congenital malformation as responsible for about 15% of the perinatal mortality. In a study conducted by Marden et al had shown about 14 % congenital anomalies among newborn babies. In the present study, the most common anatomical organs involved in congenital malformations were the central nervous, musculoskeletal, GI tract and genitourinary systems.

The cranial vault fails to develop with the brain tissue, thus exposed to amniotic fluid, leading to anencephaly. Obstruction in the circulation of cerebrospinal fluid within Aqueduct of Sylvius results into hydrocephalous, while meningocele, meningoencephalocele are affected due to ossification defects of skull bone. Similarly, congenital defects of both upper (3.4/10000) or lower limbs (1.1/10000) occur mainly due to exposure to teratogen agents during the most sensitive period of 4th - 5th.weeks of gestation. The limb malformations are often associated with other birth defects involving craniofacial, genitourinary system. Infectious agents like toxoplasmosis, rubella, cytomegalovirus, herpes and HIV virus (TORCH) play vital role to originate most of the major congenital malformations during the period of embryogenesis. The use of a vaccine against Rubella has significantly reduced (85%) the risks of major congenital anomaly. Many birth defects can be prevented by avoiding exposure to various teratogens, chemical agents and infectious environments during the most sensitive period of gestation.

Conclusion

Congenital malformations of neural tube defects like anencephaly, spina bifida, facial defects (cleft lip, palate) can be detected in an early stage by ultrasonography; amniocentesis and various genetic or chromosomal abnormalities can be diagnosed by chorionic villi sampling (CVS) and reduced maternal serum (RDS) screening. Early detection of major malformation during early pregnancy can indicate for medical termination of pregnancy to reduce the high morbidity and mortality of neonates due to congenital malformations. So proper and timely counselling, regular antenatal care with folate supplementation especially during the most sensitive period of embryogenesis is essential to avoid major congenital malformation for future pregnancy.

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