Journal of Bangladesh College of Physicians and Surgeons
Vol. 31, No. 2, April 2013

# Pattern and Frequency of Congenital Anomalies among Newborn: A Hospital Based Study

K CHOWDHURY[a], MAH MOLLAH[b], AM CHOUDHURY[c], R PARVIN[d], M BEGUM[e]

**Summary:**

***Background: Birth defects are an important contributors to infant mortality rate among all racial or ethnic groups***

***Objectives: The present study was undertaken to document the frequency and pattern of congenital anomalies among the newborn delivered at Dhaka Medical College and Hospital.***

***Methodology: This was a cross sectional study done over 2000 live born babies during January, 2008 – December,2008 in the department of Obstetrics and Gynaecology of Dhaka Medical College Hospital. After delivery all the live born babies were examined clinically within 48 hours of birth to detect the presence of any birth defect. Congenital anomalies were divided according to the involvement of organs of the body and the frequencies of different types of birth defects were also calculated.***

***Result: The overall frequency of malformation was 3.3%. Musculoskeletal system (37.88%) was the most commonly involved system followed by gastrointestinal system (25.96%). Major malformation was observed in 60.7% patients. Among the musculoskeletal system, the most frequent lesions were club foot and arthrogryoposis***

***Key words: Congenital anomaly, Newborn, Frequency.***

***(J Bangladesh Coll Phys Surg 2013; 31: 84-87)***

## Introduction:

Congenital anomalies have been appearing as important factors for infant mortality in the whole world[1]. Effective control of infectious disease and advent of better nursing have led to a gradual decline in the neonatal mortality[2]. As a result the proportions of death due to congenital malformations has increased over a period[2]. Several studies have been done on congenital anomalies in different countries where the frequency of anomalies ranged from 1.39 – 5.3%[2-12] and in Bangladesh it was 2.3%[13,14].

Patients with congenital anomalies poses a difficult challenge to the pediatricians. There are limited curative options and even these options are often expensive. In our country few studies have tried to look at this problem. Hence the present study has been undertaken to find out the frequency, pattern and severity of congenital malformations of the babies who were born in Dhaka Medical College Hospital .

## Materials and Methods:

This was a cross sectional study done over 2000 live born babies during January, 2008 to December, 2008 in the department of Gynaecology and Obstetrics Department of Dhaka Medical College and Hospital(DMCH). Still born babies were excluded from this study. Mothers who were admitted from 8 am to 8 pm in Gynecology and Obstetric Dapartment of DMCH for delivery were enrolled. After delivery, all the newborns were thoroughly examined clinically to detect the presence of any congenital anomaly by the investigator herself. Particulars of the newborn recorded include birth weight, length, head circumference, sex, gestational age and details of congenital malformation as observed by physical examination. Congenital anomalies were divided according to the involvement of organs of the body on the basis of clinically observable defects. The frequency of different type of birth defects were calculated.

Statistical analysis was performed using SPSS 16.0 programme. Data was defined as frequency distribution and percentage.

a. Dr. Kona Chowdhury, Assistant Professor, Department of Paediatrics, Ad-din Women's Medical College and Hospital

b. Dr. Md. Abid Hossain Mollah, Professor of Paediatrics (In charge of Neonatology), Dhaka Medical College and Hospital

c. Dr. Ahmed Murtaza Choudhury, Associate Professor, Department of Paediatrics, Mymensngha Medical College and Hospital

d. Dr. Ruma Parvin, Assistant Professor, Institute of Child Health and Shishu Sasthya Foundation

e. Dr. Marium Begum, Assistant Professor, Department of Neonatology (NICU), Ad-din Women's Medical College and Hospital.

**Address of Correspondence:** Dr. Md. Abid Hossain Mollah, Professor of Paediatrics (In charge of Neonatology), Dhaka Medical College and Hospital, Mobile: 01711530323, e-mail: professorahm@yahoo.com

**Received:** 01 June, 2012 **Accepted:** 24 January, 2013

**Operational definition:**

a) Congenital anomaly: Malformations (structural abnormalities) found clinically at birth during the first 48 hours of life.

b) Major anomaly: Malformations that have serious medical consequences.

c) Minor anomaly: Malformations that have no serious medical consequences.

**Result:**

66 out of 2000 newborn babies had congenital malformations. The overall frequency of congenital anomaly was 3.3%.Table 1 showed that the frequency of malformations was more in male babies (53%) than in female babies (43.93%). There were 2 cases of ambiguous genitalia.

Though there were 66 anomalous babies, total number of birth defects were 84 because 10 (15.15%) babies had more than one malformation (Table 2). Table-3 showed that among theses 84 defects, major malformations were 51(60.71%) and 33(33.29%) defects were minor.

Among the system distribution of the malformation, musculoskeletal system (37.88%) was the most commonly involved system followed by gastrointestinal (25.96%) and genitourinary (18.18%) system respectively. Anomalies involving respiratory and cardiovascular system were least common; only 3.03% cases belonged to each group (Figure 1). Table 2 shows that among the musculoskeletal system, the most frequent lesions were club foot and arthrogryoposis. Anorectal malformations and duodenal atresia (4 cases) were the most prominent lesions among GIT system

**Table-I**

*Sex distribution of anomalous babies (n=66)*

| Sex | No of Cases | Percentage |
|---|---|---|
| Male baby | 35 | 53 |
| Female baby | 29 | 43.8 |
| Ambiguous genitalia | 2 | 3.03 |

**Table-II**

*Frequency of multiple congenital anomalies (n=66)*

| Anomaly | No of cases | Percentage |
|---|---|---|
| Single malformation | 56 | 84.85 |
| Multiple malformation | 10 | 15.15 |

**Table-III**

*Distribution of birth defects according to severity (n=84)*

| Severity of defects | No of cases | Percentage |
|---|---|---|
| Major malformation | 51 | 60.71 |
| Minor malformation | 33 | 33.29 |

Note: There were 66 anomalous babies but total number of birthdefects were 84 because 10 babies had more than one malformation

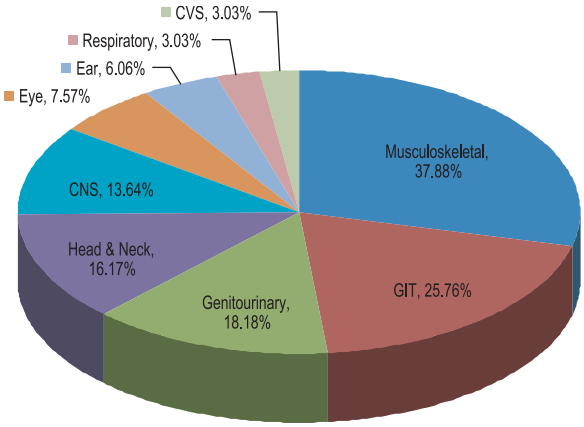


**Fig.-1:** *Distribution of malformations in different system (n=84)*

Note: Babies who had more than one malformation were placed in multiple systems. As a result the total number of birth defects increased to 84.

**Table-IV**

*Pattern of congenital anomalies by anatomical system (n=84)*

| System | Anomaly | Frequency of defectsNo (%) |
|---|---|---|
| Musculoskeletal | Club foot | 7(8.33) |
| | Arthrogryoposis | 4(4.76) |
| | Diaphragmatic hernia | 2(2.38) |
| | Amniotic band | 2(2.38) |
| | Polydactyly | 2(2.38) |
| | Increased gap between 1st and 2nd toe | 2(2.38) |
| | Single palmer crease | 2(2.38) |
| | Bowing of wrist | 1(1.19) |
| | Syndactyly | 1(1.19) |
| | Cleinodactyly | 1(1.19) |

*table continued*

| System | Anomaly | Frequency of defectsNo (%) |
|---|---|---|
| Gastrointestinal | Anorectal malformation | 5(5.95) |
| | Duodenal atresia | 4(4.76) |
| | Omphalocele | 3(3.57) |
| | Microstomia | 2(2.38) |
| | Hirschprung disease | 1(1.19) |
| | Gastroschisis | 1(1.19) |
| | Tongue tie | 1(1.19) |
| Genitourinary | Undescended testes | 4(4.76) |
| | Ambiguous genitalia | 2(2.38) |
| | Hypospadiasis | 1(1.19) |
| | Hydronephrosis | 1(1.19) |
| | Micropenis | 1(1.19) |
| Cardiovascular | TGA | 1(1.19) |
| | Dextrocardia | 1(1.19) |
| Head and neck | Cleft lip and palate | 3(3.57) |
| | Brachycephaly | 2(2.38) |
| | Tower head | 1(1.19) |
| | Micrognathia | 1(1.19) |
| | Malar hypoplasia | 1(1.19) |
| | Short webbed neck | 1(1.19) |
| | Beaked nose | 1(1.19) |
| | Depressed nasal bridge | 1(1.19) |
| CNS | Meningocele | 2(2.38) |
| | Meningomyelocele | 1(1.19) |
| | Anencephaly | 1(1.19) |
| | Hydrocephalus | 1(1.19) |
| | Sacral dimple | 2(2.38) |
| | Dermoid sinus | 1(1.19) |
| Eye | Hypotelorism | 2(2.38) |
| | Cataract | 1(1.19) |
| | Inner epicanthal fold | 1(1.19) |
| | Exopthalmos | 1(1.19) |
| | Strabismus | 1(1.19) |
| | Micropthalmia | 1(1.19) |
| Ear | Low set ear | 2(2.38) |
| | Anotia | 1(1.19) |

Note: Babies who had more than one malformation were placed in multiple systems. As a result the total number of birth defects increased to 84.

**Discussion:**

A pediatrician may face the problems of congenital malformations in day to day practice in the form of failure to thrive, mental retardation, recurrent infections etc. Their early detection and proper and timely management is important in reducing the morbidity and mortality.

The overall frequency of congenital malformation in the present study was 3.3%. This is in conformity with other studies[3,4,11,12]. However, somewhat lower incidence was reported by others[2,7,8,12-14] and also in two studies, a higher incidence was observed[5,9].

Among the system distribution of the malformations, musculoskeletal system (37.88%) was the most commonly involved system followed in order by gastrointestinal (25.74%) and genitourinary system (18.18%) respectively. Anomalies involving respiratory and cardiovascular system were least common; only 3.03% cases belonged to each group. According to severity, major anomalies constituted 51 (60.71%) cases and minor anomaly constituted 33 (38.29%) cases. Many other workers have also found the musculoskeletal system as the most commonly involved system[4,10,13]. In other studies malformations occur predominantly in central nervous system[2,3,7,15] and in cardiovascular system[10,14]. The difference in observation may be due only to clinical identification of the anomalies without any investigation. Defects of musculoskeletal system are the easiest to detect by physical examination. The low prevalence of cardiovascular defects may be due to the fact that most of them are not obvious during the first 48 hours of life.

Congenital anomalies were found to be much more in male babies. 35 cases were male and rests 29 were female. There were two cases of ambiguous genitalia. Male female ratio was 1.2:1. The male predominance has been shown by all workers[4,9,10,16-18] except Khanum S et al[13] where females were the predominant group.

**Conclusion:**

The overall frequency of malformation was 3.3%. Musculoskeletal system (37.88%) was the most commonly involved system followed by gastrointestinal system (25.96%). Major malformation was observed in 60.7% patients and 15.15% babies had multiple malformations. Among the musculoskeletal system, the most frequent lesions were club foot and arthrogryoposis.

**Limitations of the study**

1. This study was based only on clinically observable defects without the aid of investigation.
2. We tried to include stillborn babies but could not do so because of the lack of opportunity to examine the child. Most of the time either the parents did not allow to examine the deceased or they left the hospital before reaching them. This might affect the result of this study.
3. This study included only the anomalies which were visible within first 48 hours of birth but many of

the birth defects are first expressed beyond this period.

## References:


1. Fikry MM. Identification of Causes of neonatal mortality using the ICD-10 classification: a study in neonatal intensive care units in Alexandria Governorate (MOHP). J Egypt Health Assoc. 2003; 78(1-2):127-52
2. Grover N. Congenital malformations in Shimla. Indian J Pediatr. 2000; 67(4):249-51.
3. Mosquera T C, Riano G I, Rodriguez D C, Fernández T J, Moro B C, Rodriguez F A et al. Prevalence and secular trend of congenital defects in Austria, Spain. The need for clinico-epidemiological survillence. Gac Sanit. 2009; 23(4): 300-5.
4. Desai NA, Desai A. Congenital Anomalies: A prospective study. Bombay Hospital J. 2006; 48(3): 442-445.
5. Pam SD, Bode-thomus F, Isaac WE, Ibanga HB, Adewaka AO, Toma BO et al. Are congenital anolmalies common in Jos, Nigeria. Highland Research Medical J. 2004;2(2): 19-28.
6. Canada.Congenital anomalies in Canada: a perinatal health report. Public health agency of Canada. 2002.
7. Costa CM, Da Gama SG, Leal MC. Congenital malformations in Reo de Janeiro. Brazil: prevalence and associated factors. Cad Saude Publica. 2006; 22(11):2423-31.
8. Shi LM, Chia SE, Chan OY, Chew SK, Foong BH. Prevalence of birth defects and parental work in Singapore live births from 1994 to1998: a population based study. Occupational Medicine. 2002; 52:325-31.
9. Sipek A, Gregor V, Horack J. Masatova D. Birth defects occurrence in the Czech Republic in 2003. Ceska Gynecol. 2006; 71(3):194-9.
10. Yang J H, Kim Y J, Chung J, Kim M, Ryu H, Ahh H et al. A mliti-centre study for birth defect monitoring system in Korea. J Koream Med Sci. 2002; 19(1011-8934)509-13.
11. Muga RO, Mumah SCJ, Juma PA. Congenital malformations among newborns in Kenya. African Journal of Food, Agriculture, Nutrition and Development. 2009;9(3):814-29.
12. Parnar A, Rathod SP, Patel SV, Patel SM. A study of congenital anomalies in newborn. NIJRM. 2010;1(1):13-17.
13. Khanum S, Noor K, Kawsar C A. Studies on congenital abnormalities and related risk factors. Mymensingh med J. 2004 Jul; 13(2):177-80.
14. Rasul CH, Hossain MA, Rahman MS. Congenital anomalies in newborn. J Bangladesh Coll Phys Surg. 1998; 16(1):11-13.
15. Al-Jama F. Congenital malformations in newborn in a teaching hospital in eastern Saudi Arabia. J Obstet Gynaecol. 2001;21(6):595-8.
16. Lary JM, Panlozzi LJ. Sex differences in the prevalence of human birth defects: a population based study. Teratology. 2001; 64(5):237-51.
17. Zheng XY, Song XM, Chen G, Ji Y, Wu JL, Lin JM et al. Epidemiology of birth defects in high prevalence area of China. Zhongua liu xing bing xue za zhi. 2007;28(1):5-9.
18. Lisa A, Botto LD, Rottler M, Castilla E, Bianchi F, Botting B et al. Sex and congenital malformations: an international perspective. AM J Med Genet A. 2005;134 A(1):49-52.