Analytic Study Of Congenital Malformations In Four Hospitals In Baghdad

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Summary

***Background**: Congenital malformations are responsible for a considerable proportion of perinatal, neonatal and infant mortality in many Eastern Mediterranean countries. So this study aims to find out the incidence, types and probable risk factors of these malformations in Baghdad.*
***Patients and methods**: one hundred cases of congenital malformations were studied out of 8090 neonates born in 4 hospitals in Baghdad province over 5 months in 2002 (preterm, term) .The incidence , types and risk factors were analysed .*
***Results**: the incidence of congenital malformations was 12.36/ 1000 live births, with the central nervous system malformations being the commonest. There is increased risk in consanguinous marriages 27 (27%), mothers not attending antenatal care 25 (25%), mothers of low gravidity 60 (60%), and mothers not taking folic acid during pregnancy (86.7%).*
***Conclusion**: Consanguineous marriages and mothers not taking folic acid during pregnancy are important risk factors for the occurrence of congenital malformations .So I recommend genetic counseling especially for consanguineous marriages, and giving all pregnant women folic acid before and during pregnancy. A multicentre study will give more broad idea about the incidence , types ,and risk factors in our country*
***Keywords**: congenital malformations, neonates, incidence, risk factors.*

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Introduction:

The term malformation is a primary morphologic defect of an organ or body part resulting from an intrinsically abnormal development (e.g., cleft lip or polydactyl). Syndrome is a pattern of multiple primary malformations due to a single etiology (e.g. triosomy 13 syndrome). [1].

The number of recognizable patterns of malformations has more than tripled during the last 25 years [2].

The malformation might be minor or major, the incidence of major malformations is (2-3%) of live births, while that of minor one is (14%) [3, 4]. Only few multiple congenital malformations are life threatening in the neonatal period but they are the most common cause of death in this age group [5].

Genetic and congenital disorders are responsible for a considerable proportion of perinatal, neonatal and infant mortality in many Eastern mediteranian countries, especially after the decline in mortality from infectious diseases and prematurity [4, 6].

As many as (40%) of pediatric hospital admissions have a genetic basis. In developed countries, the majority of infant deaths are the result of genetic disorders and birth defects. Fourty percent of childhood deaths are due to genetic disorders and birth defects [4, 7].

There is rapidly increasing knowledge in the field of medical genetics. The prenatal diagnosis has offered the opportunity of preventing an increasing number of serious handicaps [8].

The care given to mothers before pregnancy, often in the form of advice may be of considerable benefit in preventing problems during pregnancy. So antenatal care aims to provide advice, education, and support to women and their families during pregnancy to assess risks of harm to the mother and her baby, to screen for various disorders, and to treat any problem that arises during pregnancy [8].

This study aims to highlight the incidence, types, and probable risk factors of congenital malformations in these four major hospitals in Baghdad province, Iraq.

Patients And Methods

This prospective study was carried out in 4 major hospitals in Baghdad province (Al-Yarmook general hospital, Al-Numan general hospital, Baghdad hospital (Medical city), and private nursing home (Medical city)), in the 5 months period from the first of August to the end of December 2002.

One hundred cases of congenitally malformed neonates out of 8090 live births were

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studied. All neonates were included in the study (fullterm, preterm). Twice weekly visits were done to each hospital and the cases were recorded from the registry book after they were approved by the pediatrician. The neonates were examined fully for any congenital malformations. Dead fetuses were excluded because it was difficult to keep them until the pediatrician can examine them for any congenital malformations

The mothers concerned were interviewed according to special questionnaire sheet that includes full informations about pregnancy, antenatal care, and family history, history of folic acid intake, residency, and occupation.

Results:

One hundred neonates out of 8090 live births had congenital malformations resulting in an incidence of 12.36/ 1000 live births. (Table 1).

There were 50 (50%) females, 45 (45%) males and 5 (5%) cases with ambiguous genitalia .It was difficult to differentiate the sex of these 5 cases in the delivery room, however all of them were given male names .

Different types of congenital malformations appear in this study where the central nervous system involvement constitutes the highest incidence, followed by musculoskeletal malformations (5.95/ 1000 and 1.61 / 1000 live births respectively) (Table 2).

Fifty–five (55%) of the mothers were between 20-30 years of age. (Table 3)

(Table 4) shows the mean age of mothers in relation to different types of congenital malformations, where the cardiovascular and chromosomal abnormalities happened in the older age group.

(Table 5) shows the probable risk factors, the consanguinous marriages were found in 27 (27%) of cases, {19 (19%) second degree, 8 (8%) third degree and more}. History of previous congenitally malformed neonates was found in only 9 (9%) of cases. In 25 (25%) of cases, it was the first baby and in 15 (15%) of those had neurologic defects.

Eighty-nine (89%) of mothers were housewives and 11 (11%) were employed. In 62 (62%) of cases the family lived in urban areas, while the rest were referred from rural areas of Baghdad province.

Twenty-six out of 30 cases (86.7%) of neural tube defects had no folic acid intake during pregnancy. (Table 6)

(Table 1) The incidence of congenital malformations in four hospitals.

Hospital name	Number of deliveries (live births)	No. of congenital malformations	Incidence (/1000 live birth)
Al-Yarmook general hospital	3076	37	12.02
Al-Numan general hospital	1923	22	11.44
Baghdad hospital (Medical city)	2165	25	11.54
Private Nursing home (Medical city)	926	16	17.28
Total	8090	100	12.36

(Table 2) The incidence of different types of congenital malformations.

Type of congenital malformations	No. and %	Incidence / 1000 live birth
Central nervous system malformations	48	5.95
Skeletal malformations	13	1.61
Alimentary system malformations	9	1.11
Urogenital system malformations	8	0.99
Cardiovascular malformations	2	0.25
Chromosomal abnormalities	8	0.99
Miscellaneous	12	1.49
Total	100	12.36

(Table 3) The relation between congenital malformations and maternal age groups.

Maternal age group (years)	No. and % of mothers concerned
< 20	6
20 - 30	55
> 30-40	31
> 40	8
Total	100

(Table 4) Different types of congenital malformations in relation to maternal age groups

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Type of congenital malformations	Maternal mean age
C.N.S malformations	26.68
Skeletal malformations	28.69
Alimentary system	30.55
Urogenital malformations	31.12
Cardiovascular malformations	35.5
Chromosomal abnormalities	35.87
Miscellaneous	27.75

(Table 5) Risk factors related to congenital malformations (in order of frequency)

Risk factors	% of cases
Previous congenitally malformed baby	9
Events during pregnancy	23
First baby in the family	23
No antenatal care	25
Consanguinity	27
History of abortion	32
Low gravidity (4 or lower)	60
Urban residency	62
Unemployed (Housewives) mothers	89

(Table 6) The relation of congenital malformations(neural tube defects) and folic acid intake.

Type of congenital malformation	Take folic acid	Did not take folic acid
Anencephaly	0	8
Anencephaly + meningomyelocele	1	1
Encephalocele + cleft lip + cleft palate	0	1
Encephalocele + polydactyl	0	1
Encephalocele + meningomyelocele	0	2
Spina bifida	3	13
Total	4	26

(Table 7) Comparison of congenital malformations in this study and studies in other countries.

Place of study	Time and period of the study	No. of live deliveries collected	Incidence
Baghdad (this study)	2002 (5 months)	8090	12.36/1000 live births
United Arab Emirates [18]	1992-1994	16419	10.5/1000 live births
Turkey [16]	1988-1995	9160	11.1/1000 live births
India [14]	1998-1999	2869	12.4/1000 live births
Indonesia [19]	5 years	??	9.0/1000 live births
Libya, Benghazi [9]	1995	938	6.6/1000 live births

Discussion:

Structural malformations are major causes of morbidity and mortality with world wide distribution [2, 4, 6, 7, 9].

Congenital malformations are now recognized as the leading cause of infant mortality in United Arab Emirates [10], and the second leading cause in Bahrain, Kwait, Oman and Qatar [11, 12, 13].

The incidence in this study was 12.36 /1000 live births which is higher than in a study carried out in Libya in 1995 [9], where the incidence was 6.6/1000 live births, but it is near the Indian study [14] where the incidence was 12.4/1000 live birth. Congenital malformations were increased in Bahrain from 7.2 to 18.7/1000 live births over the period 1978-1985 [15].

In this study the commonest types of malformations were central nervous system(CNS) (48%), skeletal (13%). This finding goes with Turkish study [16], and Indian study [17], but disagrees with United Arab Emirates study where the CNS malformations came in the second place [18]. It also disagrees with an Indonesian study [19], where the cleft lip and palate came first followed by talpes, multiple malformations and lastly cardiovascular malformations, and also disagrees with UK study [20] where congenital heart disease came first (55.4%), and then neural tube defect (25.7%). It also disagrees, with another Indian study where the musculoskeletal malformations followed by gastrointestinal and central nervous system defects [14].

In Libyan study, more than 2/3 of congenital malformations were chromosomal, muscloskeletal and central nervous system [9]. This is similar to the results of this study, where these malformations constitute 69 of total cases (69%). (Table 2)

A comparison of the incidence of congenital malformations in this study and studies in other countries is shown in (Table 7).

Fifty- five (55%) of the cases presented in the maternal age group between 20- 30 years (Table 3). The chromosomal and cardiovascular malformations were more prevalent in the age group 30–40 years (Table 4). This agrees with the fact that the incidence of Down syndrome and other aneuploidies increase in frequency with increasing maternal age, the incidence is 1/2000 at 20 years and 2-4% above 40 yeaars [6,7] .Benghazi study showed an incidence of Down syndrome of 2.2 % in benghazi [9],1.14/1000 in Bahrain ,1.8/1000 in Saudia Arabia and Egypt , and 1.4/1000 world wide .In this study no case of Down syndrome was found , but may appear in future studies involving larger number of patients .

The clinical evaluation of congenital heart diseases is helpful and usually diagnostic but even those serious cardiac diseases can initially be asymptomatic in the immediate neonatal period [7]. This may explain why we had a small number of congenital heart diseases in this study.

The mean maternal age in alimentary malformations (cleft lip and palate) was 30.5 years .This agrees with Canadian study [21], but in Hong Kong study in 1991[22], there was no association between age and niether prenatal mortality nor the incidence of alimentary malformations .

Twenty-seven (27%) abnormal neonates were the result of consanguinous marriages. This agrees with the previous reports from Iraq (29.2 %)., Egypt (11.4%) , Iran(30%) ,Jordan (32%) , Kuwait(30.2%) , Pakistan (37.1%) , and Saudi Arabia (31.4%)[23]. Reports from France indicated that consanguinous marriages had 10.5 times chance of having abnormal babies than the non-consanguinous couples [24]. In Indian study (Datta vikram) [14], none of abnormal babies were of consanguinous marriages, this difference propably due to the effect of Arabian and Islamic cultures of high consanguinous marriages .A study in occupied Palastine showed that the CNS malformations were more in the relative marriages [25]. These results indicate the importance of genetic counseling especially among consanguineous marriages

Sixty (60%) of the mothers in this study were of low gravidity (4 children and less), while in the Indian study (Swain etal), there were high gravidity mothers [17], possibly because of racial, socioeconomic, and cultural differences.

Employed mothers were few in this study 11 (11%), and the majority 89 (89%) were housewives. The industrial hazards here were minimal but the non-compliance of mothers to attend antenatal care clinics, and the poor health education probably was some of the risk factors.

Twenty six out of 30 cases (86.7%) of neonatal tube defects had no folic acid intake during pregnancy as shown in (Table 6). Such high percentage goes with the evidence that folic acid supplementation prevents the occurrence of neural tube defects when it is taken before conception and during pregnancy resulting in (71%) reduction in neural tube defect in high risk group pregnancy and the recommended daily allowance during pregnancy is 0.4 mg daily [20.26].

From all above I conclude that consanguineous marriages and mothers not taking folic acid during pregnancy are important risk factors for the occurrence of congenital malformations .So I recommend genetic counseling especially for consanguineous marriages, and giving all pregnant women folic acid before and during pregnancy. A multicentre study will give more a broad idea about the incidence , types ,and risk factors in our country

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