Congenital Malformations In The West Of Iraq

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Summary:

Background: *CM is the leading cause of infant deaths and account for much greater proportion of infant mortality than does premature birth. A malformation is a primary structural defect arising from a localized error in morphogenesis. This is a prospective study devoted to define the causes and frequencies of congenital malformations (CM) in Maternal and Children Hospital (MCH) in Al-Anbar governorate (west of Iraq) and a comparison is done with other Iraqi and international studies.*

Methods: *Congenital malformations were studied over a period of 2 years from the 1St of July 2000 to the 30th of June 2002 in 12831 births including stillbirths at MCH in Al- Anbar governorate (west of Iraq). A control group of 100 women who gave birth to normal newborn babies was studied similarly.*

Results: *The overall birth prevalence of CM is 8.5/1000 births (109/1283 1) and stillbirth prevalence is 21/1000 (269/1283 1) births. The most common system involved in CM is the CNS that constitute 55% of total CM followed by skeletal system 33% then GIT 7% urogenital 2% recognized syndromes 2%, and others 1 %.This study shows a significant association between each of stillbirth, LBW, polhydraminious,parental consanguinity advanced maternal age and family history of CM.The present study shows no significant association with each of urban /rural status, and sex, attending antenatal care, tonics, fever, UTI, and diabetes mellitus.*

Conclusion: *The overall birth prevalence of CM is almost the same as that recorded by Al-Saadoon et al in Basra which was 8.7/1000 in the year 1994 and lower than the birth prevalence of CM recorded by Grover-N in India in the year 2000 which was 17.8/1000 Associations between some of the risk factors and CM are similar and others are different from other studies.*

Keywords: congenital malformations; west of Iraq; 2000-2002.

Introduction:

Spectacular changes made in the last decade have had such a profound impact on biological and medical science that they have dramatically modified people's behavior concerning life events, especially congenital malformations. The matter is not only to care but first to know.

This study is devoted to define the causes and frequencies of congenital malformations in MCH in Al-Anbar governorate (west of Iraq). The population of Al-Anbar governorate is about 1020690 it is located about 110 Kms west of Baghdad with a land area of 137808Km2 MCH is the teaching hospital in this governorate serving urban and rural civilians population has 260 obstetric and pediatric beds, one delivery room and 20 neonatal beds it is a teaching hospital for obstetrics, gynecology and pediatrics training for medical students of medical college Alanbar university.

A malformation is a primary structural defect arising from a localized error in morphogenesis (1).

Congenital malformations accounts for about 20% of all infant deaths and malformations of nervous system cardiovascular system respiratory system account for most malformation deaths.

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Congenital malformations are a leading cause of infant mortality and morbidity; overall about 1 in 50 infants have congenital malformations.

Congenital malformations is the second cause of mortality in post neonatal 1-4 year old children (2).

The causes of approximately 40% of congenital malformations are unknown and although only a relatively few agents teratogenic in human are recognized new agents continue to be identified Overall, only 10% of anomalies are due to recognizable teratogens . The time of exposure is usually less than 60 days of gestation during organogenesis Recognition of teratogens offer the opportunity for prevention of related birth defects. Accidental exposure of pregnant mother to radiation is a common cause of anxiety among women their families and their physicians usually about whether the fetus will have birth

defects organic abnormalities It is unlikely that exposure to diagnostic radiation will cause gene mutations ;no increase in genetic abnormalities has been identified in the offspring exposed as unborn to atomic bomb explosion in Japan 1945 .A more realistic concern is whether the exposed human fetus will show birth defects or higher incidence of malignancies(3) There is increasing evidence that deprived populations have a high risk of congenital anomalies of non chromosomal origin and some specific anomalies (4.

Materials And Methods:

Congenital malformations were studied over a period of 2 years from the 1St of July 2000 to the 30th of June 2002 in 12831 births including stillbirths at MCH in Al- Anbar governorate (west of Iraq)

Data taken includes:

Maternal age parity education residence income antenatal care tonics and medications taken during pregnancy events like diabetes mellitus,hypretension heart disease polyhydraminious or oligohydraminius and history of previous congenital malformations, mode of delivery state of baby at birth sex and birth weight of the baby through examination of the newborn. A control group of 100 women who give birth to normal newborn babies (with out congenital malformations) was taken and studied similarly. Stillbirth was defined as being a child born at 24 or more weeks post conception who shows no sign of life (5). Congenital malformations detected by surface examination are classified according to their systemic involvement. Statistical analysis was performed using Chi square test and Fishers exact test, a P value of<0.05 was considered significant.

Results:

The total births in the two years period of the study were 12831 newborns, out of these 12562(97.9%) were live births and *269(2.1%)* were stillbirths, 6102(47.6%) were females and *6729(52.4%)* were males with a,F:M= 0.9/1.

Stillbirth females were 104(38.7%) and males were 165(61.3%) F: M=0.6/1.

Out of the total birth 109 newborn babies were recognized to have congenital malformations, 63(48.6%) were females and 56(51.4%) were males F: M= 1.3/1. The overall birth prevalence of congenital malformations is 8.5/1000 births (109/12831) and stillbirth prevalence is 21/1000 births (269/12831). The most common system involved in congenital malformations is the central nervous system (CNS) that constitute 55% of total congenital malformations followed by skeletal system 33% then gastrointestinal (GIT)7% urogenital 2% recognized syndromes 2%, and others 1 %(Table-1). There is highly significant association between stillbirth and congenital malformations, as shown in table-2 where 11.5% of stillbirths had congenital malformations compared to 6% of live births.

There is significant association between each of history of previous congenital malformations, low birth weight (LBW), and congenital malformations, while sex of the newborn babies shows no significant association with congenital malformations as shown in Table (3). Mothers above 30 years of age who deliver newborns with congenital malformations constitute 61.4% and those in the control group 43% hence advanced maternal age above 30 years shows highly significant association with congenital malformations as shown in Table-3. Polyhydraminious shows a highly significant association with congenital malformations while attending antenatal care, receiving tonics, fever, urinary tract infection (UTI) and diabetes mellitus show no significant association with congenital malformations as shown in table- 4.There is a highly significant association between parental consanguinity and having a newborn with congenital malformations.

Table- 1: Representative frequencies and birth prevalence of congenital malformations.

Congenital malformations	No.	Percent of total CM	Birth Prevalence
Central nervous system Malformations	60	5 5	7.1/1000
Isolated anencephaly	31	27.9	2.4/1000
anencephaly +absent R, leg	1	0.9	0.08/1000
Isolated hydrocephalus	9	8.1	0.7/1000
Hydrocephalus+ club foot	1	0.9	0.08/1000
Hydrocephalus +spina bifida	3	2.7	0.23/1000
Hydrocephalus +achondroplasia	1	0.9	0.08/1000
Hydrocephalus +Ascitis	1	0.9	0.08/1000
Isolated Meningocoele	7	6.3	0.61/1000
Meningocoele +club feet	1	0.9	0.08/1000
Meningocoele + spina bifida	2	1.8	0.16/1000
Isolated spina bifida	3	2.7	0.23/1000

Skeletal malformations	36	33	4.24/1000
Achondroplasia	31	27.9	2.4/1000
Club feet	5	4.5	0.39/1000
Gastrointestinal system malformations	8	7	0.68/1000
Cleft lip	6	5.4	0.47/1000
Unilateral Cleft lip and palate	3	2.7	0.23/1000
Bilateral cleft lip	2	1.8	0.16/1000
Imperforated anus	1	0.9	0.08/1000
Gastroschiesis	1	0.9	0.08/1000
Urogenital system	2	1.8	0.16/1000
Ambiguous genitalia	2	1.8	0.16/1000
Chromosomal syndromes	2	1.8	0.16/1000
Down syndrome	2	1.8	0.16/1000
Cystic hygroma		0.9	0.08/1000

Table-2: The association between state at birth and congenital malformations.

State at birth	Newborn with CM		Newborn without CM		total
	NO.	%	No.	%	
Still birth	31	11.5	138	88.5	269
live birth	78	6	12448	94	12562
Total	109		12772		12831

X2>10.38 df =1 P < 0.001

Table-3: The association between demographic and epidemiological risk factors and congenital malformations.

Risk factors	Mothers give birth with CM		Mothers with normal births		P. Value
	No	%	No	%	
Parental consanguinity	77	71	28	28	<0.001
Rural residence	73	67	62	62	0.25
Illiterate mothers	52	48	46	46	0.5
Maternal age>35 years	67	61	43	43	<0.01
Parity>4	14	13	36	36	<0.001
Low socioeconomic status	87		70	70	0.1

Table -4: The association between risk factors in pregnancy and congenital malformations.

Risk factor	Mothers give birth with CM		Mothers with normal births		P value
	No	%	No	%	
Not attend antenatal care	30	72.5	23	23	0.5
Not received tonics	67	61.5	72	72	0.25
polyhydraminious	45	41	10	10	<0.001
Fever	11	10	10	10	0.5
Urinary tract infection	13	12	14	14	0.5
Diabetes mellitus		6.5			0.1

Table-5: Comparison of three studies on congenital malformations.

	Present study 2002/west of Iraq	Al-Saadoon study 1994/	Grover-N study 2000 /India
Overall birth prevalence of CM	8.5 /1000 (109/12831)	8.7/1000 (52/5974)	17.8/1000 (180/10100)
CNS -CM	4.7/1000	1.84/1000	7.1/1000
Musculoskeletal system CM	2.8/1000	2.5/1000	4.24/1000
GIT system CM	0.6/1000	1/1000	0.69/1000
Stillbirth prevalence	21/1000	5.7/1000	30.8/1000
CM in stillborn	11.5 %(31/26. 9)	14.7%(5/34)	15.15%(47/311)

Discussion:

Congenital malformations is the leading cause of infant deaths and account for much greater proportion of infant mortality than does premature birth (6).The total birth prevalence of congenital malformations is 8.5 /1 000.1t is almost the same as that recorded by A1-Saadoon et al (7) in Basra which was 8.7/1000 in the year 1994 and about half the prevalence of congenital malformations which was recorded by Grover-N (8) in India in the year 2000 which was 17.8/1000. This might reflect the geographical variations of congenital malformations with their world wide distribution.

The birth prevalence of central nervous system malformations in the present study is the most common (4.7/1000) and anencephaly constitute more than half of the cases (2.5/1000) Crukle and Wald (9) showed that the birth prevalence of anencephaly and spina bifida declined by 80% (from3.15 to 0.6/1000) between the years 1972 and 1985. Prenatal diagnosis followed by termination account fort 31 % of the decline. The 1983 Research Council trial indicated that folic acid has a protective of 72% within a recommended daily dose of 5 mg. following the work of the MRC vitamin study group it is now recommended that folic acid 0.4 mgs anencephaly should be given to all women planning a pregnancy (level 1 evidence).Ten percent of newborns with CNS malformations had a positive family history of congenital malformations equally divided between anencephaly and hydrocephalus and this is expected since type of malformations a polygenic mode of inheritance .

Hydrocephalus, isolated or combined constitute 25% of CNS congenital malformations with a birth prevalence of 2/1000 births a collaborative prenatal survey found a prevalence of hydrocephalus of 1.5/1000 live births, only half of them were evident at birth. A current prevalence of hydrocephalus, prenatal or infantile is between 0. 48 -0.81/1000 births (10).The ability to diagnose hydrocephalus antenatally by ultrasound means that some cases are prevented by termination. Grover-N found that the congenital malformations involving the CNS were the most common (7.1/1000) followed by musculoskeletal (4.24/1000) while the genitourinary are the least common (0.68/1000).These findings are almost similar to the present study result, while Al-saadoon study in Basra recorded the highest prevalence of congenital malformations in the musculoskeletal group (2.5/1000) followed by CNS (1.84/1000). The still birth rate is 21/1000 births the study showed that 11.5% of stillbirth have congenital malformations, while 6.35% of live births have congenital malformations. Stillbirth rate is highest in Grover - N study (3 0.8/1000) while it is (21 /1000) in the present study and lowest in Al-saadoon s (5.7/1000) and this difference might be attributed to the very high birth prevalence of CNS malformations especially anencephaly in the present and Govers-N studies compared to Al-Saadoons. The skeletal malformations group has a birth prevalence of 2.8/1000 and achondroplasia constitutes 83% of them with a prevalence of 2.3 /1000 births t Although inherited as autosomal dominant trait most cases of achondroplasia now occur as new mutations (11), for this reason it is found that only one in ten of mothers who deliver these babies have a previous history of similar congenital malformations, with a mean age of 26 years and gravida two or less. The gastrointestinal tract congenital malformations constitute 8% of the total malformations with a birth prevalence of 0.62/1000, 75% of these are cleft lip and its combinations. Cleft lip with or with out cleft palate is one of the common congenital malformations affecting about 1/1000 live births, in 1/3rd of patients there is family history and the main etiologic factor is genetic, in spite of that none of those with cleft lip/ palate combinations in this study had given a positive family history of similar anomalies. The fact that the ratio of cleft lip with or with out cleft palate to cleft palate alone is 2/1 (2) is almost similar to the present study results.

Chromosomal syndromes were detected in two cases and both of them were Down syndrome with a mean maternal age of 26
years and both were primigravida mothers. Birth prevalence of Down syndrome is 0.16/ 1000 which is much less than that recorded by Cuckle-H et al in London (10.8/1000 births) (9).his might be explained by the fact that one quarter of congenital

malformations is not detected before the age of 3 months (2),and others might not be notified immediately; this was also noted by Reerink-JD et (12).This study shows a significant association between each of stillbirth, LBW, polyhydraminious, parental consanguiniy, and family history of congenital malformations, advanced maternal age and having a newborn with congenital malformations. This is in agreement with many studies; GroverN (8) who noted the significant association with LBW and advanced maternal age Agarwel-SS et al (13) who noted the significant association with consanguinity and polyhydraminios Chaturvedi-P et al (14)who noted the significant association with consanguinity in parents family history of congenital malformations and hydraminious,and no significant association with each of urban -rural status and sex. The present study shows no significant association with each of urban -rural status, and sex, attending antenatal care, receiving tonics in 1St trimester, history of fever, UTI, and diabetes mellitus. Congenital malformations are more in newborns of diabetic mothers than controls but the difference is statistically not significant (P. value= 0.08). This study shows more congenital malformations in low socioeconomic status families but the difference is not statistically significant.

This is in agreement with Vrijheid et al (4) suggest that the more deprived population have a higher risk of congenital anomalies of non chromosomal origin. Based on the results obtained it should be considered that congenital malformations are a major public health problem that deserve national health programs to provide rational approaches to this situation, as obstetricians epidemiological knowledge and their awareness of associated risk factors are essential for detection and primary prevention of birth defects .

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