The Pharma Innovation Journal 2018; 7(5): 140-147

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2018; 7(5): 140-147

www.thepharmajournal.com
Received: 04-03-2018
Accepted: 06-04-2018

Nawfal Abdul-Hamza Imran
MBCHB, DCH, Care Unit in Al-Zahraa Teaching Hospital at Al-Najaf City, Iraq

Ali Zgher Hameed
Babel Health Directorate, Care Unit in Al-Zahraa Teaching Hospital at Al-Najaf City, Iraq

Correspondence
Nawfal Abdul-Hamza Imran
MBCHB, DCH, Care Unit in Al-Zahraa Teaching Hospital at Al-Najaf city, Iraq

Recognizable congenital malformations in newborn babies in neonatal intensive

Nawfal Abdul-Hamza Imran and Ali Zgher Hameed

Abstract
Objective: Recognizable congenital abnormalities of newborn, this study has been performed at the neonatal intensive care unit at Al- Zahraa Teaching Hospital for Maternity and Pediatrics at Al- Najaf governorate from first of June 2009 to the Thirty first of May 2010, to determine the congenital abnormalities in newborn infants and to identify the most common type and their predisposing factors.
Patients and Methods: Our study covers the structural defects that have been detected in alive newborns referred from the labor room and operative theater to the neonatal intensive care unit within one year. Information taken from the patient's mothers and relatives in a well prepared questionnaire, clinical examination of newborn had been done by consultant pediatrician and data were analyzed by chi square test.
Results: From total 11164 newborn babies 139(1.25%) newborn have visible congenital malformation, male to female ratio was (1.5:1), the most common congenital abnormalities in sequence were those affecting the CNS 61 (43.9%), followed by multiple congenital abnormalities 28 (20.2%), musculoskeletal abnormalities 16 (11.5%), chromosomal and genitourinary abnormalities each one 8 (5.8%), cleft lip and palate and skin abnormalities each one 7 (5%) then ear and eye abnormalities and exomphalos each one 2 (1.4%).Seventy eight(56.1%) parents were reported to be consanguineous and 61 (43.9%) were negative in regard consanguinity. High percent of congenital abnormalities occurs with age of mothers ranging from 15 – 25 years 75 (54%), and first baby in the family was the most commonly affected with congenital anomalies 42 (30.2%), and highest occurrence of congenital abnormalities in newborn baby 60 (43.2%) had weight ranging from 2 – 3 kg, and 109 (78.4%) of babies with congenital anomalies were term. Fatality rate increases among those newborns with major abnormalities.
Conclusion: Congenital malformations in newborn infants in our studied sample is near to the different parts of our country and neurological anomalies, especially neural tube defect, are the most common types, about two-third of congenital malformations occurs in term babies, with B. Wt. (2-3 Kg), and being the first child in the family and more frequently in babies delivered to relatively young mothers aged between (15-25 years), consanguinity is one of major risk factor and about one third of newborn babies with congenital malformations died before discharge from hospital or immediately post-delivery especially those with major malformations.

Keywords: Recognizable congenital malformations, newborn babies, neonatal intensive

Introduction
The term congenital abnormality signifies that there has been disruption in the normal process of organogenesis occurring before birth. The earlier the insult, the more gross the abnormality. [1] According to World Health Organization (W.H.O.) congenital abnormalities definition: are structural, functional, and/or biochemical – molecular defects presenting at birth. It can be classified into lethal, sever, and mild form. Their causes can be genetic, environmental and complex multifactor [2]. Other definitions 1-Major congenital anomaly: a structural abnormality present at birth which has a significant effect on function or social acceptability, example: Cleft lip.[3] 2-Minor congenital anomaly: a structural abnormality present at birth which has minimal effect on clinical function but may have a cosmetic impact, example: pre auricular pit [3] 3-Developmental variation: a cosmetically and functionally in significant structure deviation from the usual, of prenatal origin and usually familial, example: fifth finger clinoductly. [3] As a result of advances in the care of immature low birth weight infants, congenital malformations and genetic disorders have assumed an important role as a cause of morbidity during the first month of life,and not all the abnormalities are detected at birth. Thus, surveys may under es estimate the true incidence. nonetheless, as noted in a study of 155 newborns, Holmes (1976) documented that 2% of newborns have a serious malformation that has surgical or cosmetic importance furthermore, the national foundation of March of Dimes of New York estimates

that genetic errors affect more than 15 million persons in the U.S. with mental retardation, diabetes, complete or partial blindness, impaired hearing, defect in specific organ system, and congenital bone, muscle, or joint disease. [4] Estimates of the total incidence of congenital abnormalities vary widely depending upon what is regarded as serious enough to be included and up to what age the infants surveyed are followed. [5] Major structural abnormalities occurs in 2 to 3% of live born infants, and additional 2 to 3% were recognized in children by the age of 5 years, a total of 4 to 6%. [6] Minor anomalies occur in approximately 15% of newborns. [6-8] It is estimated that 1 in 40, or 2.5% of newborns, have recognizable malformation or malfunction at birth. In about half of the cases, a single isolated malformation is found, while the other half display multiple malformations, and 10% of pediatric hospital admission have known genetic conditions, 18% have congenital defects of unknown etiology, and 40% of surgical admission are patients with congenital malformations. Twenty to 30% of infant death and 30 to 50% of deaths after the neonatal period are due to congenital abnormalities. In 2001, birth defects accounted for 1 in 5 infant death in United States, with a rate of 137.6 deaths per 100,000 live births, which is higher than other causes such as preterm/ low birth weight (109.5/100,000), sudden infant death syndrome (55.5/ 100,000), maternal complications of pregnancy (37.3/100,000), and respiratory distress syndrome (25.3/100,000 [9] Congenital abnormalities can be a result of the followings

1. Monogenetic (7.5% of serious anomalies) X
Linked hydrocephalus, achondroplasia, ectodermal dysplasia, Apert disease, Treacher Collins syndrome.[7]

2-Chromosomal (6%)
Triosomies 21, 18, 13. XO, XXY, Deletion $4p^-$, $5p^-$, $7q^-$, $18p^-$, $18q^-$, $22q^-$, Pradar-Willi Syndrome (50% have deletion of chromosome 15). [7]

3-Maternal infection (2%), Intrauterine infection (e.g. Herpes Simplex, CMV, Varicella, Rubella, and Toxoplasmosis) [7]

4-Maternal illness (3.5%)
D.M, PKU, hyperthermia [7]

5. Uterine environmental (% unknown)
A-Deformation: Uterine pressure Oligohydramnios: club foot, torticollis, congenital hip dislocation, pulmonary hypoplasia, 7th nerve palsy [7] B-Disruption: Amniotic band, congenital amputation, gastrochisis, and porencephaly, intestinal atresia C-Twining: Conjoined twins, intestinal atresia, porencephaly [7]

6. Environmental agents (% unknown): Polychlorinated biphenyle, herbicides, Mercury, Alcohol [7]

7. Medication (% unknown): Thalidomide, diethylstilbestrol, phenytoin, warferin, cytotoxic drugs, paroxetine, ACE inhibitors, isotetinoin (vitamin A), D-penicillamine, valproic acid [7]

8. Unknown Etiologies: Polygenetic: Associated with infertility (spontaneous or with treatment), anencephaly/ spina bifida, cleft lip/ palate, pyloric stenosis, congenital heart disease [7]

9. Sporadic syndrome complexes (Anomalads)
CHARGE Syndrome, VATER Syndrome, Prune-Belly Syndrome, Pierre Robin Syndrome [7]

10. Nutritional
Low folic acid-neural tube defects [7] The Classification of Birth Defects according to the nature of presumed causes of the defects.

1. Malformation
is a primary structural defect arising from a localized error in morphogenesis result in abnormal formation of a tissue or organ, example: Neural tube defect,Fetal alcohol syndrome, Holoprosencephaly [6, 7]

2-Dysplasia
Refers to an abnormal organization of cells into tissue,as in Velocardiofacial syndrome [6, 7]

3-Deformation
is an alteration in shape or structure of a structure of organ that has differentiated normally, as in Scaphocephaly, Congenital hip dislocation, Torticollis, Lung hypoplasia, Scoliosis [6, 7]

4-Disruption
Is a structural defect resulting from destruction of a structure that had formed normally before the insult,as in Amniotic band.[6, 7]

5-Syndrome
Is defined as pattern of multiple malformations that are caused by a single event that can have many etiologies, example: Rett syndrome, Prader-Willi syndrome [6, 7].

6-Association
refers to a nonrandom collection of malformations where there is an unclear relationship among the malformations such that they do not fit the criteria for a syndrome or sequence, as in VACTERL association(Vertebral, Anal atresia, Cardiac defect, Tracheoesophegeal fistula, Renal anomalies, Limb anomalies).[6, 7] When a newborn with one or more malformations is identified, a detailed history and physical examination should be undertaken to ascertain whether additional malformations are present and to seek a specific etiologic diagnosis. Diagnostic studies should be selected based on the information elicited and a working diagnosis should be developed. The family should receive detailed counseling in a setting and with content that is appropriate to their needs. Medical records and reports should reflect available laboratory and clinical data, diagnostic considerations and a plan for ongoing care, evaluation and management. Although reaching an etiologic diagnosis for the newborn with multiple malformations is a primary goal of the evaluation process, a specific diagnosis might not be apparent after detailed evaluation and diagnostic testing. For a variety of reasons, such as age-dependent phenotypic or behavioral manifestations or uniqueness of the pattern of malformations, diagnosis is not always apparent in the newborn period [3, 4]

Aims of the study 1
To identify congenital abnormalities and their percentage and identify the most common one in newborn infants in neonatal

intensive care unit in AL-Zahraa Teaching Hospital for Maternity and Pediatrics [2] To identify the predisposing factors that lead to congenital abnormalities.

Patients and methods

Our study was carried out in neonatal intensive care unit in Al-Zahraa teaching hospital for Maternity and pediatrics at Al-Najaf governorate for all newborn infants delivered by cesarean section and vaginal delivery from the period extending between first of June, 2009 and thirty first of May, 2010. A total of (11164) neonates were examined and evaluated. from this total number,(139) live newborn infants were recognized to have visible congenital malformations after their admition to neonatal intensive care unit and evaluation was made by history and clinical examination using information list including age,sex,body weight and gestational age. Detailed history was taken from mother or close relatives. Maternal history: age, parity, history of abortion, or previous babies with congenital anomalies, still birth, medical illness, history of drugs intake during pregnancy, history of consanguinity between father and mother had been considered with respect to first degree relatives (marriages between cousins) and second degree relatives (between distant relatives) and non-relatives (negative in regard consanguinity). Statistical analysis was carried out using Chi-square test in this regard we considered P value as significant when it is <0.05

Results

Eleven thousand and one hundred sixty four (11164) live neonates (7076 were females, and 4080 were males, and 8 ambiguous genitalia) delivered by cesarean section and vaginal delivery were examined during our study period (one year),of whom 139(1.25%) had proven to have visible congenital malformation(71(51%) females and 60 (43.2%)males and 8(5.8%) ambiguous genitalia). Male to female ratio 1.5:1 (this represent percent of babies with congenital malformations from total No. of males and females)

The categorization data of patients with congenital malformation are given in:

Table (1): The distribution of newborn babies according to the type and percentage of congenital abnormalities. The overall percentage 1.25 % (139/11164), 43.9% (61/139) had neurological congenital abnormalities which are the most common type in our study Table (2): Sex distribution of neonates with congenital malformations, from 139 cases had congenital abnormalities 71 (51%) female, and 60 (43.2%) male. Table (3): Distribution of each type of congenital malformation in newborn babies according to maternal age, 54.7% (76) occur between (15-25 years)of maternal age. and 33.1%(46) with age between(26-35), 11.5%(16)with age (> 35years), 0.7%(one case)with age(<15 years). P value < 0.05 (there is significant relation between them). Table (4): Occurrence of each type of congenital malformations in newborn babies according to relatives and non-relatives parents, CNS 61cases (36 have positive history of consanguinity, were 25 negative history for consanguinity), Multiple congenital anomalies 28 cases (18 have positive history of consanguinity, were 10 negative history for consanguinity)and other congenital anomalies shows in the table. P value >0.05 (there is no significant relation between them Table (5): Occurrence of each type of congenital malformations in newborn babies according to maternal parity, 41 % (57) occur in mothers with grand multi (≥4 children). P value < 0.05 (there is significant relation between them). Table (6): Association of sex category with gestational age of neonates, in the percentage of neonatal congenital malformations. P value > 0.05 (there is no significant relation between birth age and sex of babies with congenital malformations).ambiguous genitalia was excluded from total number. Table (7): Comparison between different studies in our country and other countries with our study in regard to percentage of common congenital malformations. Figure (1): Distribution of newborn babies with congenital malformations in regard to maturity, 78.4 %(109) were term (≥ 37 weeks gestation), and 21.6 %(30) preterm(less than 37 weeks)Figure (2): Distribution of congenital malformations among newborn babies in regard to their birth weight, the highest occurrence 43.2%(60) had body weight between(2-3 kg),and 31.7%(44)had body weight between (3-4kg),and18%(25)had B.wt.between(1-2kg),and 5%(7)had B.wt. (> 4kg),and 2.1%(3)had B.wt.(<1kg). Figure (3): Seasonal variation of affected newborn babies with congenital malformation, and the commonest season of deliveries with congenital malformation was Spring 28.8% (40), Winter 28% (39), Summer 24.5% (34),and Autumn 18.7%(26). Figure (4): Distribution of congenital malformations among relatives and non-relatives parants,62.6%(87)were reported to be consanguineous (36 cases first degree relatives and 51 second degree),and 37.4%(52) were non relatives Figure (5): Percent of occurrence of congenital malformations according to the sequence of affected child, the first child was the commonest affected with congenital malformations 30.2%(42), the second and third child 28.8%(40), fourth and fifth child was 23.7%(33), sixth and seventh child was 10.8%(15), eighth and ninth child was 4.3%(6),and > ninth child was 2.2% (3).

Figure (6): The outcome of babies with congenital malformations, 46 %(64) refer to other hospital for further management, 33.1 %(46) was dead in hospital, 20.9 %(29) discharge to home after become stable

Table 1: Distribution of newborns according to the type of anomalies.

Types of anomalies	No.	%
Neurological	61	43.9
Multiple congenital anomalies	28	20.2
Musculoskeletal anomalies	16	11.5
Trisomy 21(Down syndrome)	8	5.8
Genitourinary anomalies	8	5.8
Cleft lip and palate anomalies	7	5
Skin anomalies	7	5
Ear and eye anomalies	2	1.4
Exomphalos	2	1.4
Total	139	100

Table 2: Sex distribution of neonates with congenital Malformation. M: F ratio 1.5:1

Sex	No.	%
Males	60	43.2
Females	71	51
Total	131	94.2

Ambiguous genitalia 8 (5.8%) was excluded

Table 3: Congenital malformation in newborn babies according to maternal age**.**

Types of anomalies	Maternal age				Total NO.
	< 15 years	15-25 years	26-35 years	>35 years	
CNS	1	34	20	6	61
Multiple congenital anomalies	0	20	8	0	28
Musculoskeletal	0	9	5	2	16
Chromosomal	0	2	3	3	8
Genitourinary	0	4	3	1	8
Cleft lip and Palate	0	3	1	3	7
Skin	0	3	4	0	7
Ears and Eyes	0	0	1	1	2
Exomphalos	0	1	1	0	2
Total NO.	1	76	46	16	139

$X^2 = 52.477$

$P < 0.05$ (statistically significant)

Table (4): Congenital malformations in neonates according to history of consanguinity between parents

Types of anomalies	+VE Consanguinity	-VE Consanguinity	Total NO.
CNS	36	25	61
Multiple congenital anomalies	18	10	28
Musculoskeletal	12	4	16
Chromosomal	2	6	8
Genitourinary	5	3	8
Cleft lip and Palate	5	2	7
Skin	6	1	7
Ears and Eyes	1	1	2
Exomphalos	2	0	2
Total NO.	87	52	139

$X^2 = 12.733$

$P > 0.05$

Table 5: Occurrence of congenital malformation in newborn babies according to maternal parity.

	Types of anomalies	Parity	Total NO.
	First Baby	Multiparity (2-3)	Grand Multipara (≥4)	
CNS	24	16	21	61
Multiple congenital anomalies	11	10	7	28
Musculoskeletal	3	6	7	16
Chromosomal	1	0	7	8
Genitourinary	1	3	4	8
Cleft lip and Palate	1	2	4	7
Skin	0	3	4	7
Ears and Eyes	0	0	2	2
Exomphalos	1	0	1	2
Total NO.	42	40	57	139

$X^2 = 27.700$

$P < 0.05$ (statistically significant)

Table 6: Association of sex category with gestational age of neonates in percentage of neonatal congenital malformations**.**

Category	Male	Female	Total (%)
Premature neonate	8	17	25(19)
Term neonate	51	55	106(81)
Total (%)	59(45)	72(55)	131(100)

Ambiguous genitalia were excluded.

$X^2 = 1.301$

$p > 0.05$

Table 7: comparison between different studies in our country and other countries with our study in regard to percentage of common congenital malformations.

Congenital anomalies	Or study	Baghdad	Babylon	Saudi Arabia	UAE	UK	BRAZIL
Neurologicl	43.9%	43.3%	49%	10%	10%	15.09%	8%
romosomal	5.8%	10%	7.1%	0.13%	3%	10%	3.3%
Genitourinary	5.8%	3.3%	.3%	5%	24%	27%	30%
Cleft lip and palate	5%	20%	12.8%	5%	8%	4.9%	%

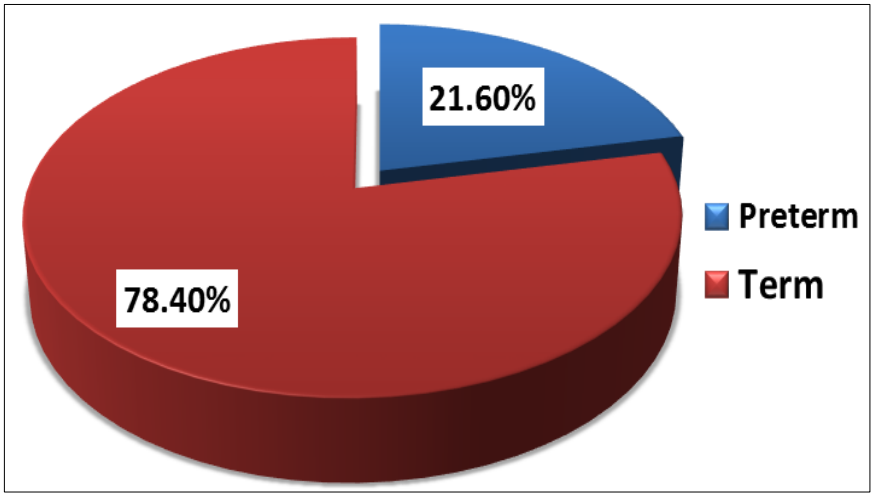

Fig 1: Distribution of affected newborn in regard to maturity

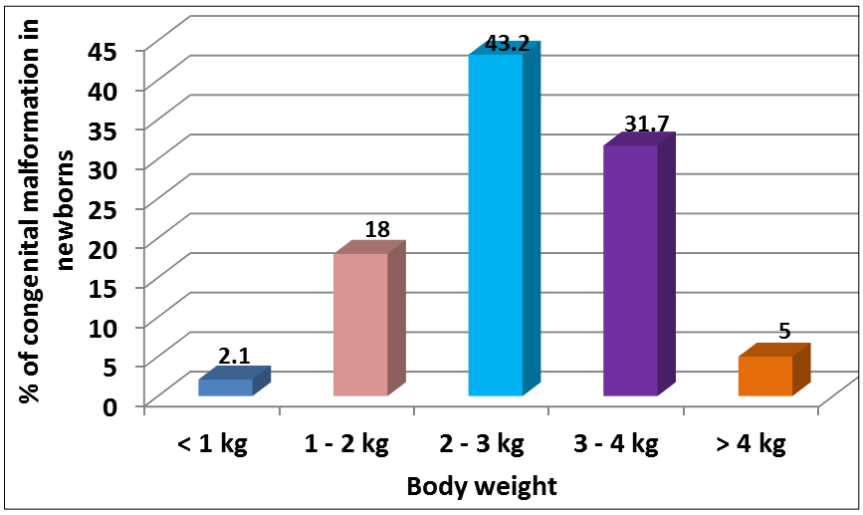

Fig 2: Distribution of congenital malformations according to body weight

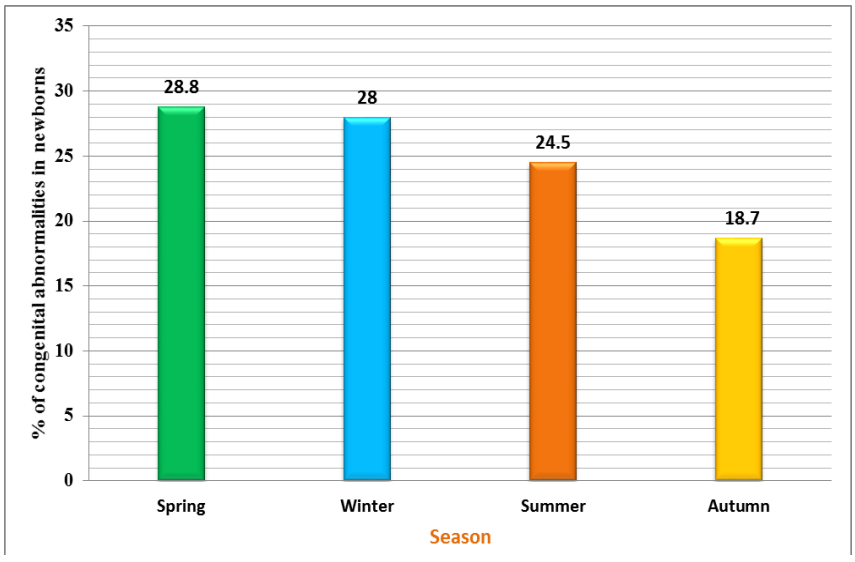

Fig 3: Seasonalvariation of affected newborns with

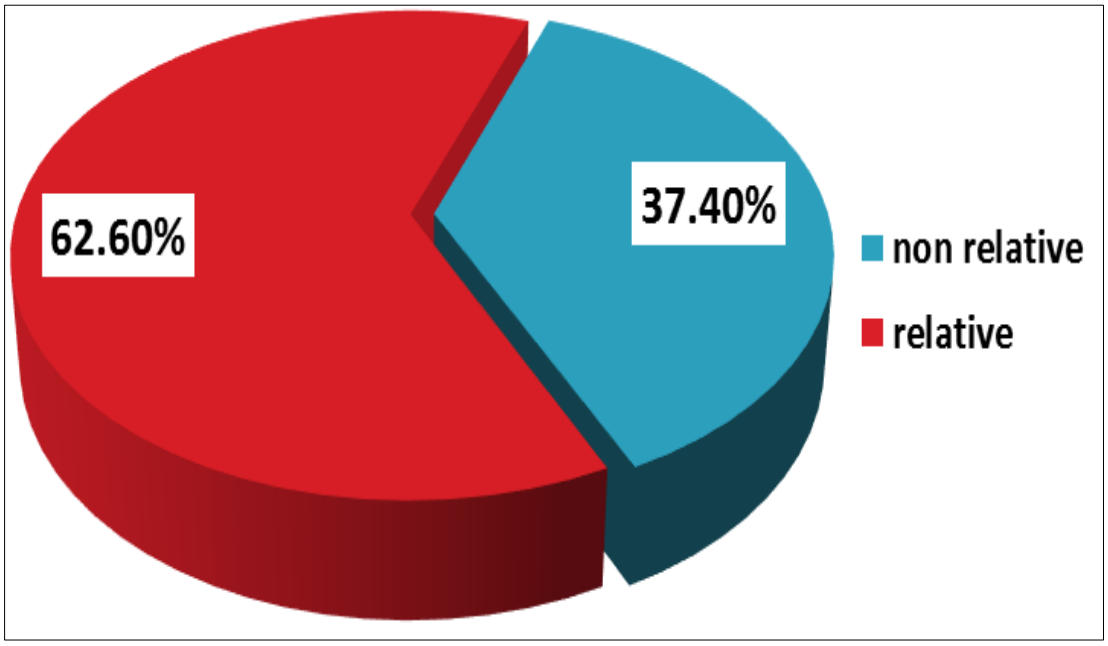

Figure 4: Distribution of congenital malformation among relative and non-relative parents.

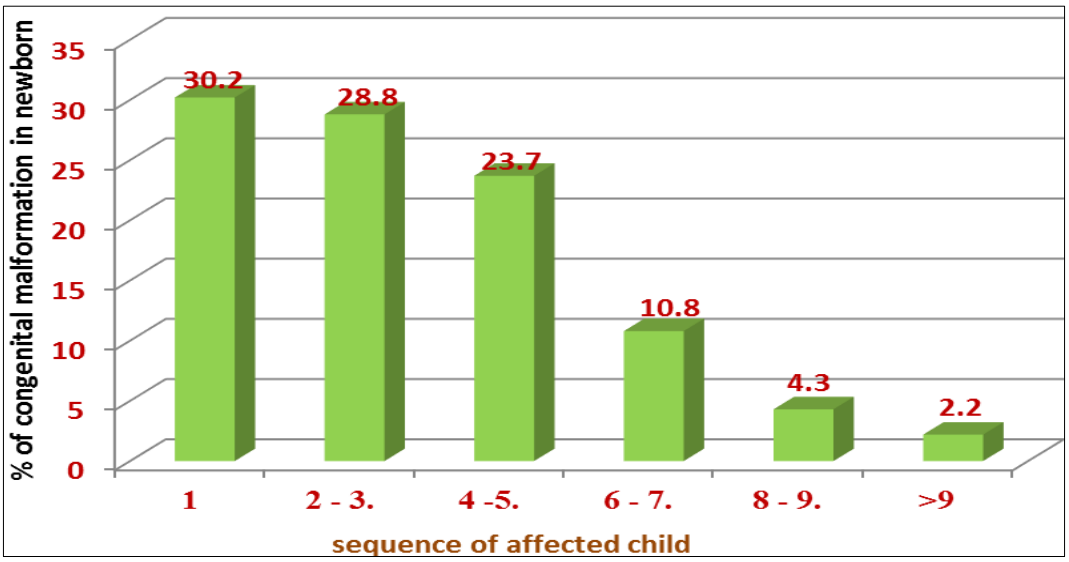

Figure 5: % of occurrence of congenital malformations according to the sequence of affected child

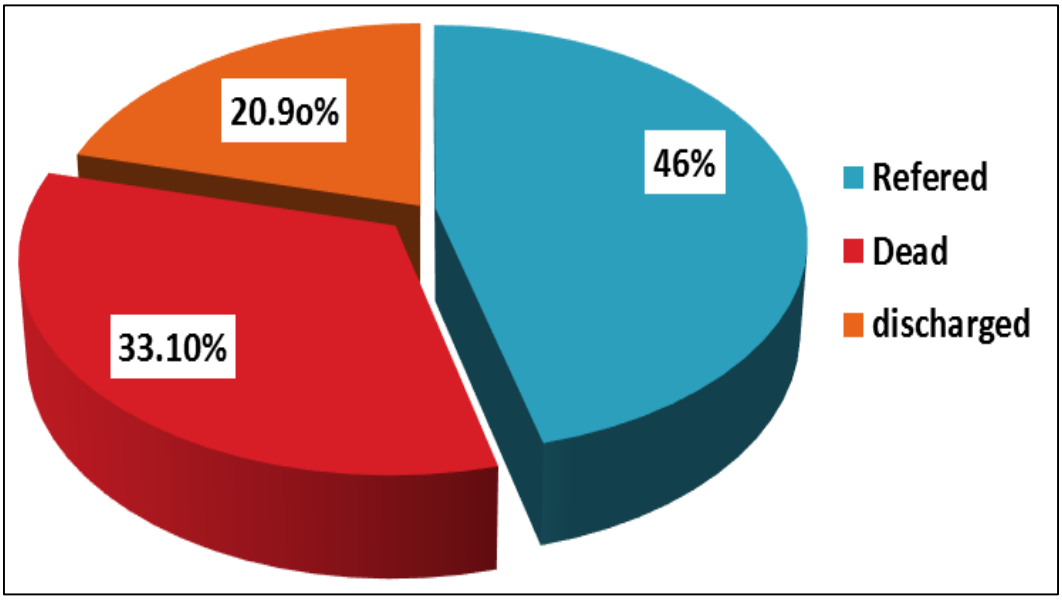

Figure 6: Outcome of babies with congenital malformation**.**

Congenital malformation

Discussion

Our study covers visible structural defects in live born infants that had been detected within one year in AL-zahraa teaching hospital. In such studies the incidence of congenital malformations cannot be determined because it is a hospital based rather than community based study, but percentage of congenital malformations can be determined among admitted newborn babies. [10] There were a total (11164) deliveries (vaginal and caesarean section), (139) babies delivered alive with birth defects had been admitted to neonatal intensive care unit and been studied. The percentage of congenital malformations in our study was (1.25%), while in study done in U.K. there was (2%) of live birth had congenital malformations. [11], in a study done in Saudi Arabia the percentage was (3.5%). [12] However the percentage of congenital malformations in Sweden was (3%). [13] Out of (139)newborn babies with congenital malformations, the most common anomalies found were C.N.S. anomalies 61 cases forming 43.9% these anomalies including(neural tube defect anencephaly and hydrocephaly). These high percentage of C.N.S. anomalies may be related to inadequate preconceptional taking of folate and/or poor compliance and because of such problem in some countries suggestion of adding folate to certin food for example flour to ensure population compliance remain debatable. [14] In our study also there were 28 patients (20.2%) had multiple congenital malformations which involved more than one system. The study shows 16 patients (11.5%) had musculoskeletal abnormalities including spine, upper and lower limb abnormalities, and achondroplasia, while only 8 patients (5.8%) suspected to have chromosomal anomalies, in our study we took only Down syndrome by detection main features of this syndrome (because our study was included only visible malformations) so other syndromes may be present but we classified it in list the of multiple congenital anomalies. There were 8 patients (5.8%)with genitourinary abnormalities included(ambiguous genitalia);and there were 7 patients (5%)with cleft lip with or without cleft palate; and there were 7 patients (5%)with skin abnormalities mainly(collodian babies);and there were 2 patients (1.4%) with ears and eyes anomalies; and there were 2 patients (1.4%)with exomphalos. The neurological abnormalities in this study was 43.9%,while in Babylon study was 49%,[16], and in Baghdad study was 43.3% [17], while in Saudi Arabia study was 0.7/1000 [18], and in Ireland study was 4.6/1000 [19]; these high percentage in our country could be related to inadequate education of our people in regard to supplementation of folic acid and poor antenatal care,while in Ireland and in Saudi Arabia, there are facilities for prenatal diagnosis of at risk pregnancy. The percentage of chromosomal abnormalities in our study was 5.8%, while in study in U.K. the percentage was 10% [11, 26], while in study in Saudi Arabia percentage was 0.13%. In our study the most common congenital anomalies were C.N.S. 43.9%,while in Saudi Arabia the most common anomalies were genitourinary 25%,and neurological anomalies were 10% [12, 20], in U.A.E. the most common anomalies were genitourinary anomalies 24% [21], and in Brazil the most common anomalies were genitourinary anomalies 30% (22).(as show in table no.7) Out of 139 newborn babies, 51% were females, and 43.2% were males, and 5.8% were ambiguous genitalia, male to female ratio was 1.5/1. In regard to gestational age and weight distribution in babies with congenital abnormalities 109(78.4%) were term (58 babies with body weight 2-3 kg.,and 44 babies with body weight 3-4kg.,and 7 babies with body weight > 4kg.); and 30 (21.6%)were preterm(28 babies with B.Wt. 900 gm.-2 kg., and 2 babies with B.Wt. >2 kg.); such result could be attributed to no facility to antenatal diagnosis in our country leading to delivered of term babies with such anomalies whereas roughly increment in incidence had been found in preterm and small for gestational age in infants study in U.K. [11]. Inspite of occurrence of congenital malformations in all seasons of the year, spring season showed the highest percentage of such anomalies and least occurrence in Autumn season, we should put in our mind spring season was time of deliveries so if there is relation between season and congenital malformations this occur during season of conception and organogenesis, other study considering this aspect of seasonal variation showed spring season was the highest percentage of such anomalies(similar to our result) and least occurrence in summer season.[17] This study showed the percentage of occurrence of congenital malformations was 56.1% among newborns delivered to consanguineous parents, while in Saudi Arabia the percentage of occurrence was 70% [22], despite the high prevalence of consanguineous marriage, the overall incidence of congenital abnormalities were not higher than in other part of the world [23, 24]. Regarding to the relation of mother's age with occurrence of congenital malformations the study showed the percentage of congenital malformations were very high among mothers age between 15-25years 54.7 % (76 cases) this may be attributed to some extent to the fact that,this age was the preferable for marriage, and may be due to families habits (regarding the preference of midwife interference at home in older age group mothers, so babies with such anomalies may go undiagnosed or may die from major anomalies and not registered),this had been disapproved in a study done in England, which concluded that the increasing age of mothers(and to lesser extent of the fathers)may increase the risk of congenital anomalies especially chromosomal defects [25]. With respect to parity of the mothers, our study revealed that most anomalies occurred in the first baby, whereas least occurred in multi parity, this could be related to preference of home deliveries, so many affected babies missed and not recorded. In addition, our study showed there was no regular pattern of inheritance, as there was not significant family history of congenital abnormalities, which could be explained by the fact that most anomalies could be the result of mutation of certain gene in the family. Although there were strong relationship between exposure to radiation and occurrence of congenital malformations during pregnancy, there were no one of babies with congenital anomalies delivered to mother who had been exposed to x-ray; this could be result of increase awareness of pregnant ladies regarding the risk of x-ray exposure during pregnancy. In this study we found that the disease of mothers during pregnancy with or without drugs intake during such period were relatively insignificant regarding the occurrence of congenital malformations in newborn babies,as only 15 mothers had disease during or before pregnancy(5 cases hypertensive,4 cases D.M.,3 cases had history of toxoplasmosis,and 2 cases Rh –ve mothers not received anti D in previous pregnancies, and one case had hypothyroidism)and of whom only 10 cases took drugs during pregnancy; so these results could be due to either most pregnant ladies in our society not followed their antenatal care regularity, so most disease passed undiagnosed,or the diseases well controled with or without drugs,so no affect on growing fetus. Finally regarding to the outcome of babies with congenital malformations, the study showed that 46% of them were refered to other hospitals for further management, were as 33.1% died in the hospital included those mainly delivered with major and multiple congenital abnormalities, and 20.9% discharged home after stabilizing their conditions, the percent of dead babies with congenital abnormalities may increase because death may occur in those babies referred or discharged (we have no idea about outcome of these groups).

Conclusions

1-Total percentage of congenital malformation in newborn infants in our studied sample is near to the figures in different parts of our country. 2-Neurological anomalies, especially neural tube defect, are the most common types of congenital abnormalities in newborn infants. 3-About two-third of congenital malformations occur in term babies, with B.Wt. (2-3 Kg), and being the first child in the family. 4-Congenital malformations occur more frequently in babies delivered to relatively young mothers aged between (15-25 years). 5-Consanguinity is one of major risk factor of babies with multiple defects. 6-About one third of newborn babies with congenital malformations died before discharge from hospital or immediately post-delivery especially those with major malformations.

Recommendations

1-Every effort should be made to obtain an etiological diagnosis in the newborns with one or more congenital malformations. A specific

diagnosis will enable the physicians to understand the immediate and long term needs of patients mobilize the resources required to optimize outcome and provide information regarding education, genetic recurrence risk and support the family. 2-Promoting-use of folic acid supplement among pregnant women pre-and periconceptionally, is essential to decrease the incidence of neurological anomalies, especially neural tube defects. 3-Enhancement of antenatal diagnostic facilities in teaching hospitals in our country in order to diagnose congenital malformations in infants as early as possible. 4-Counseling of parents: parents should receive information about the diagnostic process and diagnosis in a manner that is linguistically appropriate and ethnically and culturally sensitive.

References

1. Campell N, Mcintosh Forfar, Arneils, textbook of pediatrics, Appleton &Lange. 2002; 1(2):645.
2. Alan H, Decherney. Lauran, Nathan, current Obstet. Gynac Diag. and treat. Black well science Ltd, 9 th. Ed., 2003, 110.
3. Website:htt://www.health.state.ny.us/nysdoh/dpprd/exec.htm American college of medical genetics foundation/2003, definition and evaluation of newborn with single or multiple congenital anomalies.
4. Robert K Creasy MD. Maternal fetal medicine, 4 th. ed., Saunders Comp. 1999; 1(62):1185-1186.
5. Peter GB. Johnston: The newborn child, 8 th. Ed. Appleton &Lange. 1998; 13:193-196.
6. TW Sadler. Langman's Medical embryology, 9 th. ed. Vol. 1, Lippincott Williams & Wilkins. 2003; 7:149-150.
7. Behrman R, Kliegman Rebert, Jenson Hal, Stantan Bonita. causes of congenital malformation, Nelson Textbook of pediatric. WB Saunders Company. 18 th. Edition. 2007; 108:786-788.
8. Richard E, Behrman, Paul A Levy, Robert W Marion. Nelson essentials ofpediatrics, 5 th. ed., Elsevier Saunders. 2006; 50:237-241.
9. Website: http:// the international classification of disease and related health problem, 10 th. Revision, WHO, Congenital malformation, deformation of Nervous system ICD-10. 2010; 14:740-758.
10. Al-Rawi WS. Childhood congenital heart disease. 2004; 4: 30-31.
11. Roizen NJ, Patterson D, Congenital abnormalities. occurrence and outcome in the UK. Lancet. 2003; 361:1281-1289.
12. Hassib N, Naji K. Congenital malformation: Are there more prevalent in population with a high incidence of consanguineous marriages? Annuals of Saudi Medicine, 2005; 17:2.
13. Jone K, Smith M. Recognizable patterns in human malformation, 5 th. ed., Churchill Livingstone, 2-6, 677-746.
14. Dewhurst's Text. Gyn. Obstet.; Antenatal care, D.Keith Edmonds, Black well science Ltd., at (U.K.), 7 th. ed. 2007; 6:40-43.
15. Richard E, Behrman Paul A. Levy & Robert W. Marion: Nelson essentials ofpediatrics, 5 th. ed., Elsevier Saunders, 2006; 50:228-231.
16. Bushra J. Al-Rubaii, Yahya A. Al-Tufaily, Mohammad Fakri; Iarq,Babylon, Babylon medical college, 2007-2008.,Congenital anomalies admitted to intensive neonatal care unit in Babylon teaching hospital for maternity and pediatrics.(published in Journal of the Arab Board of Health Specializations, 2008.
17. A'ala TH. Congenital abnormalities in newborn infants, A thesis submitted to the Iraqi committee for medical specialization in partial fulfillment of the requirement for the degree of fellowship of the Iraqi committee for medical specialization in pediatric, (not published), 2006.
18. McLean MH. The frequency of spina bifida in parts of Saudi Arabia.Saudi Med. J 1995; 6:69-74.
19. Stevenson AC, Johnson HA, Stewart MIP, Golding DR, Congenital malformation: a report of a study of series of consecutive birth in 24 centers. Bull WHO. 1999; 34:1-30.
20. Stevenson RE, Allen WP, Pai GS *et al*. Decline in prevalence of neural tube defects in high risk region of United States. Pediatrics. 2000; 106:677-83.
21. Topley JM, Dawodu AH, The pattern of congenital anomalies among UAE nationals. Saudi Med. J 2001; 16:425.
22. Lowry R, Steen N, Rankin J, Stillbirths, congenital abnormalities. Journal of Epidemiology and Community Health, 2003; 57:499-500.
23. Teebi AS, Al-Saleh QA, Odeh H Meckel s, syndrome and neural tube defect in Kuwait. J Med. Genetics. 2004; 29:140.
24. Scottish Health Statistics. Information and statistics Division, National Health Services in Scotland, 2001, 40,
25. Mclntosh R, *et al*. The incidence of congenital malformations; Pediatrics. 2002, 14:505-22.
26. Rankin J, Pattened S, Dolk H, Abramsky L Boyd P *et al*. Prevalence of congenital anomalies in five geographical areas of the UK, 1991-1999.Archives of Disease in Childhood, Fetal and Neonatal, edition. 2005; 90:374-79.
27. Richmond S. A population-based study of prenatal diagnosis of congenital malformation over 16 years. BJOG: An International Journal of Obstetrics and Gynecology. 2005; 112:1-9.
28. Behrman R, Kliegman Rebert, Jenson Hal, Stantan Bonita. Management and counseling, Nelson Textbook of pediatric. WB Saunders Company. 18 th. Edition, 2007; 108:793.