Profile of Disability Cases referred to Teaching Children Rehabilitation Center in Suliamania in 2008

Haitham Issa Al Banna
MSc

Abstract

Objective: To determine types of disabilities in children referred to Teaching Children Rehabilitation Center (TCRC) in Suliamania.

Material & Method: A retrospective study of cases referred during 2008. Patient's information include age, sex, residence and parents consangious marriage, socio-economic status in addition to type of disability and it's relation to maternal age, parity, previous family history of abortion, dead fetus or handicaps .Data were statistically analyzed.

Results: Seven hundred seventy three patients were referred to the center,(61.5%) were diagnosed before they completed their first year,(50.2%) of mother age were between 25-34 years, female offspring were affected more than males(53%,47%), primary educated mothers were more than illiterates(47.5%,11.9%),more in urban areas than rural (63.8%,36.2%), hospital delivery was more than home (86.4%,13.6%),low parity(52.9%),consanguineous marriage was(40.4%),family history of abortion was(23.2%),dead fetus was(13.8%) and handicapped (63.0%), low socio-economic status more affected by disability (61%).The musculo-skeletal system was the mostly affected system (57.6%) followed by central nervous system (30.3%) & then chromosomal abnormalities (6.9%).

Conclusion: Disability was more common among middle maternal age, low parity, female babies, low socio-economic status, urban area of Suliamania, primary education of mothers, non-consanguineous marriage and family history of abortion, dead fetus or handicapped. We recommend premarital counseling which is of great use in the detection of congenital malformation, reducing consanguineous marriage and mothers should have medical care and get the necessary vaccination.

Keywords: Disabilities, Children, Rehabilitation center, Suliamania.

Introduction:-

Congenital malformations or anomalies as a main cause of disability affect about 5% of all infants; they arise during intra-uterine life and are thus present at birth, whether they are recognized at that time or not.

Causative factors include chromosomal anomalies, multi-factorial etiology, single gene disorders and environmental factors but no causes can be found for many cases. There is considerable ethnic and geographical variation in the birth prevalence of specific congenital malformation [1].

According to WHO the term congenital malformation or anomalies include any morphological, functional and biochemical-molecular defects that may develop in the embryo and fetus from conception until birth, present at birth, whether detected at that time or not, and this term is synonymous with the term birth defect used in the united state of America[2]. About 30% of children born with congenital or genetic disorder may be expected to die in infancy, and about30% mostly with genetic diseases will suffer from chronic sever disability, A limited number of inherited disorders can be treated well enough for schooling, work, marriage and sometime even for reproduction to be possible, However, this often involves life-long, burdensome and expensive management [3]. The leading causes of infant morbidity and mortality in poorer and developing countries are malnutrition and infection [4], whereas in developed countries they are cancer, accidents and congenital malformation [5].

The congenital malformation or birth defects pose a remarkable health, economical and psychological burdens on the individual, the family and the community. This is due to the fact that to date there is no definitive cure; hence the health care programs are ineffective in controlling disease manifestation and complication [6].

Also the treatment and rehabilitation of children with disability is costly, and complete recovery is usually impossible [7].With improved perinatal care, the proportion of infant deaths due to peri-natal factors will decline also with the control of communicable diseases through the expanded program of immunization, disability due to birth defects are given more attention especially with earlier diagnosis, improved management facilities and research work on their prevention [8].

There are some risk factors associated with increase in the incidence of disability due to congenital malformation in infancy and children like increase maternal age, some maternal diseases during pregnancy like Diabetes Mellitus and the birth in a family of a previous child with congenital malformation [9].

Aim of the study:-

To investigate the magnitudes, nature and associated risk factors of disabilities referred to the Teaching Children Rehabilitation Center (TCRC) in Suliamania in 2008.

Patients & Methods:

This study is a review of records of infants and children referred to TCRC which serves as a referral center for disabilities or handicapped children from primary health centers and private clinics in Suliamania. (Birth or congenital malformations as a main cause of disability are defined as structural defects of infant and children development that require medical and/or surgical intervention that impede the normal body function and reduce life expectancy). For the purpose of this study multiple congenital anomalies were counted only once by the system of the most major malformation. We categorized infants and children with disability according to the system involved and causes of disability. Diagnosis of disability was based mainly on routine clinical examination. Collected data include information on maternal variables(parity, age, educational level), type of disability and causes, location of delivery, consanguineous marriage rate, family history of abortion, dead fetus or handicapped in addition to other socio-demographic characteristics (income, place of residency of the family) Data analysis using Chi-square and p-value of <0.05 was assumed to be statistically significant.

Results:-

The current study include 773 disabled infants and children .Females offspring were more affected than males(53%,47% respectively), main age of presentation of disabilities was < 1 year (61.5%) while (26.2%) were between 1-3 years .Common maternal age is within (25-34) years which constituted 50% while 29.2% were between 16-24 years. Most of the disabled (63.8%) were from inside Suliamania while the remaining (36.2%) were from rural or semi-urban area. Regarding the educational level of the mothers, primary education were more commonly affected (47.5%) followed by secondary education (29.2%), Most of the disabled were born in hospital (86.4%) while only (13.6%) born in home. Maternal parity of 1-2 child was more prevalent in our study and consanguinity is only positive in (40.4%) of the cases. All the cases of disabilities showed strong family history of abortion, dead fetus or handicapped and the majority of them (61.0%) were from low socioeconomic status as shown in **table (1).**

Table 1: Distribution of disabled children attending Teaching children rehabilitation center (TCRC) according to some maternal and child variables.

Variable		No,	%
Age of disabled child	Less than one year	475	**61.5**
	1-3 year	202	**26.2**
	4-6 year	56	**7.3**
	7 year and above	40	**5.1**
Maternal age	16-24	226	**29.2**
	25-34	388	**50.2**
	35-44	143	**18.5**
	45 +	16	**2.1**
Gender of disabled	Female	410	**53.0**
	Male	363	**47**.0
Place of residence	Urban	493	**63.8**
	Rural	280	**36.2**
Educational level of mothers	Illiterate	92	**11.9**
	Primary	367	**47.5**
	Secondary	226	**29.2**
	Tertiary	88	**11.4**
Location of delivery	Home	105	**13.6**
	Hospital	668	**86.4**
Maternal parity	1-2	409	**52.9**
	3-4	190	**24.6**
	5 +	174	**22.5**
Parental Consanguinity	Yes	312	**40.4**
	No	461	**59.6**
Previous family history	Abortion	179	**23.2**
	Dead fetus	107	**13.8**
	Disability	493	**63.0**
Socioeconomic status of the family	Low	473	**61.0**
	Middle	207	**27.0**
	High	93	**12**.0

Table (2) show that the musculo-skeletal system was the most affected system which involved (57.6%), Central nervous system came second in frequency(30.3) then chromosomal aberration mostly Down's syndrome(6.9%).

As shown in **table (3)** females were more affected than males (53.1%, 46.9% respectively), Female predominance is highly significant(p-value <0.0001) in Developmental Dysplasia of Hip (DDH) which is the most obvious cause of disability (41.3%) followed by cerebral palsy (13.0%), delayed physical development (11.6%), lower limb deformity(7.1%), Down's syndrome (6.1%), upper limb deformity(5.1%), congenital heart diseases (4.1%) and others causes(11.3%). Male predominance is more in cerebral palsy, delayed physical development, lower limb deformity, Down's syndrome, congenital heart disease and others, while female predominance is more in addition to DDH in upper limb deformity.

Table 2:- Distribution of disabilities according to system involved

System involved	No.	%
Musculo-skeletal system	445	57.6
Central Nervous system(CNS)	234	30.3
Chromosomal abnormality	53	6.9
Cardio-vascular system	32	4.1
Other systems [(a)]	9	1.1
Total	773	100.0

a – Renal, respiratory, endocrine

Table 3:- Distribution of disabilities according to causes and gender

Cause	Male		Female		Total		P-value
	No.	(%)	No.	(%)	No.	(%)	
Developmental Dysplasia of Hip	110	34.4	210	65.6	320	41.3	0.00001
Cerebral palsy	62	61.4	39	38.6	101	13.0	0.06
Delayed physical Development	51	56.6	39	43.4	90	11.6	0.30
Lower Limb deformity [(a)]	35	63.6	20	36.4	55	7.1	0.09
Chromosomal (Down's syndrome)	25	53.2	22	46.8	47	6.1	0.72
Upper Limb deformity [(b)]	17	43	23	57	40	5.1	0.43
Congenital Heart diseases	17	53.2	15	46.8	32	4.1	0.77
Others [(c)]	46	52.2	42	47.8	88	11.3	0.72
Total	363	46.9	410	53.1	773 (100.0)		

a– including clubfoot (talipes-equinovarus and calcaneovalgus) pescavus and planus
b-including weakness, injury and brachial plexus injury (Erb's palsy)
c- including spinal deformity (Scoliosis, Lordosis, Torticollous), deafness, behavioral disability, speech difficulty

Table (4) shows that consanguinity marriage was associated with less number of disabilities in all the disabled cases. In the current study (59.6%) were non-consanguineous while only (40.4%) showed parental consanguinity, the non-consanguineous marriage is significant for both (DDH) and Down's syndrome P-value (<0.05). Table (5) shows that the most prevalent maternal age who gave birth to disabled offspring was age (25-34 years) followed by those of younger age (16-24 years) then (35-44 years) which is statistically significant p-value (< 0.001) for all the types of disabilities except for Down's syndrome which is more prevalent among the age group (35-44 years) with a highly significant association, P-value (<0.001).

Table 4:- Pattern of disability and parental consanguinity

Disability	Consanguineous No. %	Non- Consanguineous No. %	p-value
Developmental Dysplasia of Hip	124 (38.7)	196 (61.9)	0.00001
Cerebral palsy	45 (44.5)	56 (55.4)	0.37
Delayed physical development	41 (45.5)	49 (54.4)	0.49
Lower Limb deformity	23 (41.8)	32 (58.2)	0.32
Chromosomal (Down's syndrome)	15 (31.9)	32 (68)	0.04
Upper Limb deformity	16 (40)	24 (60)	0.3
Congenital Heart diseases	13 (40.6)	19 (59.4)	0.38
Others	35 (39.7)	53 (60.3)	0.11
Total	312 (40.4)	461(59.6)	

Table 5: Distribution of disability according to maternal age

Disability	Maternal age (%)				Total	p-value
	16-24	25-34	35-44	45+		
Developmental Dysplasia of Hip	110	177	31	2	320	0.0000
Cerebral palsy	30	42	28	1	101	0.0000
Delayed physical development	30	45	14	1	90	0.0000
Lower Limb deformity	16	28	8	3	55	0.0001
Chromosomal (Down's syndrome)	11	15	20	1	47	0.0023
Upper Limb deformity	8	19	11	2	40	0.007
Congenital Heart diseases	7	16	9	0	32	0.004
Others	14	46	22	6	88	0.0000
Total	226	388	143	16	773	

Table (6) shows the distribution of disabilities regarding parity which shows that most of disabilities occurred to Primigravida (27.9%) followed to para 2 mothers (24.9%) then to para 5& more mothers (22.5%) which is statistically significant p-value (<0.05) for DDH, cerebral palsy, delayed physical development and chromosomal abnormalities.

Parity one is more with Developmental Dysplasia of the Hip, Cerebral Palsy, upper and lower limb deformity.

Parity two is more with delayed physical development.

Parity three is more with congenital Heart diseases.

Parity five had more children affected with cerebral Palsy and chromosomal (Down's syndrome) and others diseases.

Table(7) shows the relationship between causes of disability and previous family history of abortion, dead fetus or handicapped which shows that (23.1%) of the mothers had previous history of abortion which is more with congenital heart diseases,(13.8%) had previous history of dead fetus which is more with Cerebral palsy and chromosomal abnormality and (63.7%) with history of disability which is more with Developmental Dysplasia of hip, Delayed physical development, Cerebral palsy and others diseases and all the finding were statistically significant p-value (<0.05).

Table 6:- Distribution of disabilities according to maternal parity

Cause	1 (%)	2 (%)	3 (%)	4 (%)	5+ (%)	Total	P-value
Developmental Dysplasia of Hip	105**(32.8)**	100**(31.2)**	47**(14.7)**	19**(5.9)**	49**(15.3)**	320	**0.0000**
Cerebral palsy	33**(32.6)**	21**(20.8)**	8**(7.9)**	7**(6.0)**	32**(31.7)**	101	**0.0000**
Delayed physical Development	25**(27.7)**	26**(28.8)**	15**(16.6)**	6**(6.6)**	18**(17.8)**	90	**0.012**
Lower Limb deformity	15**(27.3)**	13**(23.6)**	12**(21.8)**	3**(5.5)**	12**(21.8)**	55	0.138
Chromosomal (Down's syndrome)	6**(12.7)**	9**(19.2)**	3**(6.4)**	10**(21.3)**	19**(40.4)**	47	**0.015**
Upper Limb deformity	13**(32.5)**	6**(15.0)**	3**(7.5)**	7**(17.5)**	11**(27.5)**	40	0.153
Congenital Heart diseases	7**(21.8)**	3**(9.3)**	10**(31.2)**	4**(12.5)**	8**(25.0)**	32	0.359
Others	12**(13.6)**	15**(17.0)**	18**(20.5)**	18**(20.5)**	25**(28.4)**	88	0.365
Total	216**(27.9)**	193**(24.9)**	116**(15)**	74**(9.6)**	174**(22.5)**	773	

Table 7:- Distribution of disabilities according to previous family history

Cause	Abortion	Dead	Disability	Total	P-value
Developmental Dysplasia of Hip	66(20.6)	24(7.5)	225(70.3)	320	0.0000
Cerebral palsy (spastic)	33(32.6)	24(23.7)	66(65.3)	101	0.0000
Delayed physical Development	20(22.2)	12(13.3)	61(67.7)	90	0.0000
Lower Limb deformity	11(20)	6(10.9)	34(61.8)	55	0.0006
Chromosomal (Down's syndrome)	12(25.5)	10(21.2)	27(57.4)	47	0.025
Upper Limb deformity	9(22.5)	8(20)	21(53.5)	40	0.052
Congenital Heart diseases	9(28.10	3(9.3)	14(43.7)	32	0.058
Others	19(21.5)	20(22.7)	45(51.1)	88	0.003
Total No. (%)	179(23.1)	107(13.8)	493(63.7)	773	

Discussion:-

The gender was not equally affected as females in general were more affected than males (53%,47% respectively) and this finding was inconsistent with observation from Arak [10,11] ,Saudi Arabia [12] and other reports from different countries [13], which show that the male is more affected than the female.

In the current study, (61.5%) of disability , the diagnosis was made before one year which is inconsistent with results of other studies which that some of disabilities due to congenital malformation may not be diagnosed in the first year, In other studies, researchers have found that they diagnosed 43% of malformation at birth since not all congenital malformation can be detected at birth or shortly thereafter [14].The finding that (61%) of the disabilities were from low socio-economic status give an explanation that most of these disabilities may be due not only to genetic background but also to multifactorial etiology like nutritional deficiencies (folate or iodine) or maternal infection (Rubella, toxoplasmosis, and cytomegalovirus). In our study, musculo-skeletal system is the most common system affected(57.6%) followed by central nervous system(30.3%) then chromosomal abnormality in general and Down's syndrome in particular(6.9%) which is inconsistent with studies in Saudi Arabia [15] .and United Arab Emirates[16]. That show that systems involved were circulatory, musculo-skeletal, central nervous system and also inconsistent with findings of Cheng N et al and Sahar K [17, 18]. Who showed that CNS anomaly was the highest cause of disabilities and consistent with finding from Nigeria where musculo-skeletal and central nervous system was more prominently affected [4]. These variations of the systems involved could be explained by the effect of different racial, ethnic and social factors between these countries or due to different geographical, nutritional and socio-economic factors .Another explanation for this variation in congenital malformation is the criteria for diagnosis between these countries. The cause of low reported number of cardiovascular diseases in our study (4.1%) is thought to be under diagnosis and not merely rare occurrence because most of this malformation is diagnosed at later stage in the development of infant, malformation of the great vessels is under reported because usually it can be diagnosed only at autopsy [19]. Theoretically, consanguineous marriage have a relatively higher risk of producing offspring with disability than that of the general population as in countries like Saudi Arabia with a high consanguinity rate, it is tempting to blame consanguinity as one of the risk factors in the occurrence of disabilities, consanguinity rate in this study was (40.4%), non-consanguineous marriage is more in developmental dysplasia of the hip, cerebral palsy which is statistically signifant(P-value <0.05) while consanguinity is more in delayed physical development. Consanguinity in our study for congenital heart disease was (40.6%) which is inconsistent with Mohamed l et al [20]. in

which congenital heart diseases is associated with high rate of consanguinity (59%). DDH represents one of the most important and challenging cause of disability of the musculo-skeletal system as (41.3%) of the disability which had been referred to the center was DDH. Approximately one in 1000 children is born with a dislocated hip[21] .Contributing factors to DDH include intra-uterine positioning, female sex, race, positive family history, first born status are the most important risk factor. It has been hypothesized that DDH is more common among girls because the female hormone circulating in placenta of a female fetus may contribute to increase joint laxity. Our result for DDH is consistent with Al-Kattan et al [21] regarding female gender predominance. Cerebral Palsy is a heterogeneous group of persistent disorder of movement and position caused by non-progressive defect or lesion of immature brain with different etiology in the pre-peri-or postnatal period.

Males affected in the current study were more than females and this finding is similar to Al-Khalidi M [22] in that male gender is considered as a risk factor in Cerebral Palsy patients. Although the diagnosis of Cerebral palsy is made purely on clinical ground but selected investigation may be required to ascertaining the cause [22].In addition to cerebral palsy, male predominance is in delayed physical development, lower limb deformity, Down's syndrome, congenital heart diseases and others.

All the causes of disabilities show association with mothers aged (25-34 years) followed by younger age group(16-24 years) then mother age group between(35-44 years) which is statistically highly significant(p-value <0.001),except for Down's syndrome which is more among mother age group between (35-44 years).

The finding that maternal middle age has been implicated with higher occurrence of disability is inconsistent with Al-Hosani et al and Singh R et al [16,19] in that older maternal age has been associated elsewhere with higher occurrence of congenital malformation and disabilities.

The current study reveals a significant association between low parity and causes of disability as the highest number of disability were for mothers who had one child followed by two children (DDH, Cerebral palsy, Delayed physical development with P value <0.01) then five and more which is inconsistent with Al-Hosani et al [16] .that grand multiparity has been associated with higher frequency of disability and one explanation for why first born babies are more commonly affected by disability is because the mother's uterus has not been stretched out yet by the process of labor. The exception for low parity is with Down's syndrome which showed strong association with high parity (P-value <0.01) and older maternal age which is in agreement with Niazi MA et al [23] findings, where Down's syndrome was associated with advanced maternal age and multiparity. Previous family history of abortion, dead fetus or handicapped was strongly associated with disabilities in all the types which are statistically highly significant (P-value < 0.01). The disability that occur in more than one member in the same family can have at least four causes, teratogens, an inherited chromosomal abnormality, multi-factorial inheritance and Mendelian inheritance [24] .Birth disabilities can recur in families and the risk of recurrence have been investigated in clinical-based studies [25].

Conclusion:-

Disabilities were more common among offspring of middle age mother, primigravida. Female child gender in urban area of Suliamania, hospital delivery. Primary education of mothers, strong family history of abortion, dead fetus or disabilities and low socio-economic status. We recommend primary preventive programmes to be strengthened to reduce disability due to congenital malformation particularly those related to maternal illnesses, good nutrition of pregnant women, Moreover, it is imperative to create an effective support services of physical, educational, vocational and social rehabilitation for those babies surviving with impairments, disabilities and handicaps as a result of congenital malformation.

Reference:-

1-Gosden C. Cell culture in: Brock D, Rodeck CR, Ferguson-smith MA (eds). Prenatal diagnosis and screening. Edinburgh, Churchill Livingstone, 1993**.**

2- Al-Hosani, Salah M, Abu-Zeid H, Farag H and Saade D. The national Congenital Anomalies Register in the united Arab Emirates.**EMHJ, 2005; 11(4):690-698**

3- Bahakim H, Bamgboye E, Mahdi A, Al-Mugeiren M, Familusi J. Pediatric in patients at king khalid University Hospital, Riyadh, Saudi Arabia in 1985-1989,Annals **of Saudi Medicine,1993;13(1):6-13**

4- Asindi A, Ibia Eo, Udo JJ. Mortality pattern in Nigerian children in 1980, **Journal of tropical medicine and hygiene, 1991; 94:152-5.**

5- Behrman RE, The field of pediatrics in: Behrman RE, Kliegman RM (eds),**Nelson textbook of pediatrics, 14th edition, Philadelphia, WB Saunders, 1992;1-5 .**

6- El-Hazim MA. Genetic in health and disease, Riyadh KSA: Dar Al-
Oloum Bookstore: 2003.

7- Harris J, James L. State-by-State cost of birth defects-1992 in **teratology 1997; 56(1, 2):11-16.**

8- Czeizel AE, Modell B. What proportion of congenital anomalies can be prevented? **BMJ, 1993; 306(6876):499-503.**

9- Behram and Vaughan. Infant of diabetic mothers, **Nelson textbook of pediatrics, Philadelphia, WB Saunders: 1996; 419-21.**

10-Shamohamidi F, Ahadi MA, The survey of Congenital Malformations in Live birth in Taleghania Hospital, Arak, Iran , **Journal of Arak University of Medical Science:1997; 1(4): 23-9.**

11- Golalrpour M, Congenital Malformation at a referral Hospital in Gorgan, Islamic republic of Iran, **EMHJ, 2005; 11(4):707-14** .

12-.Refat My, Al-Moghanem M, McDonald P, Reyes L. Major birth defects at King Fahad Hofuf Hospital. Prevalence, risk factors and outcomes, **Annals of Saudi Medicine, 1995; 15(4): 339-43**

13-Stevenson AC, Johnston HA, Stewart MI, Golding DR. Congenital Malformation, A report of study of series of Consecutive births in 24 centers. **Bulletin of the World Health Organization, 1966; 34(suppl):9-27**

14- Holmes LB. Inborn errors of morphogenesis, EMHJ: 1974; October: 763-73.

15- Magbool G. Congenital Anomalies in Live born Saudi infants, **Emirates medical Journal, 1989; 7:7-10.**

16- Al-Hosani H, Czeizel AE. Congenital abnormalities in the United Arab Emirates.**Teratology, 2000; 61:161-2.**

17- Cheng N, Baiy, Hu X, Pei H, Zhang W ,Zhang P. A base-line survey on birth defects in Gansu province, West China, **Annals of tropical pediatrics, 2003; 23: 25-9.**

18- Sahar K. Congenital Anomalies in newborn babies in the Northern part of IRAQ. **Ann.Coll.Med.Mosul, 2001; 27(1):30-33.**

19-Singh R, Al-Sudan O. Major Congenital Anomalies at birth in Benghazi, Libyan Arab Jamahiriya, **EMHJ, 2000; 6(1): 65-75 .**

20-Mohammad L, Abdullah A, Abdullah S, Mansour M, Ahmad A . Consanguinity and major genetic disorders in Saudi children: A community based cross-sectional study**, annals of Saudi Medicine, and 2008; 28(3): 169-73.**

21- Al- Kattan A, Al-Youzbaki D. Social background for mothers having infants and children with Developmental Dysplasia of Hip. **Iraqi Journal community Medicine, 2009; 22(1):18-23.**

22- Al- Khalidi M. Clinical presentation and CT scan findings in children with Cerebral Palsy. **Iraqi Journal community Medicine. 2009; 22 (1): 40-47 .**

23- Niazi MA, Al-Mazyad AS, Al-Husain MA . Down's syndrome in Saudi Arabia. Incidence and cytogenetics**, Hum Hered, 1995; 45:65-9.**

24- Al-Arrayed SS. Epidemiology of Congenital abnormalities in Bahrain **EMHJ, 1995; 1(2):248-52.**

25- Lie RT, Wilcox AJ, Skjaerve R. A population based study of the risk of recurrence of birth defects**, NEJM, 1994; 331(1):1-4.**

Lecturer/ College of Medicine/ University of Suliamania/ Department of Family and Community Medicine