Pattern of congenital heart disease in newborn in Al-Diwaniyah maternity and children teaching hospital

Abbas Muhammed Hussain* ,Adel Jabbar Hussain* and Qahtan Kayon Hmood**

الخلاصه

تشكل امراض القلب الولاديه في حديثي الولاده مشكله مرضيه بحاجه الى فحوصات مستفيضه وربما تحتاج الى تداخلات علاجيه عاجله.

من أجل مراجعة طبيعة امراض القلب الوراثيه في حديثي الولاده في مدينة الديوانيه ومن اجل توضيح العلاقه بين امراض القلب الولاديه وبعض المتعلقات مثل الجنس ودرجة القرابه.

بدأت الدراسه في الاول من حزيران لعام2008 حتى الاول من كانون الثاني لعام 2010.تم شمول كل حديثي الولاده المشتبه لكونهم يعانون من امراض القلب الولاديه في هذه الدراسه وقد تم اخذ تاريخ المرض مع تاكيد على تاريخ ماقبل واثناء وبعد الولاده'وكذالك تم السؤال عن الجنس وعن الطفل هل كان كاملا او مبتسرا اثناء الولاده،وهل يوجد طفل في العائله مصاب سابقا بامراض القلب الولاديه،وماهي درجة القرابه بين الاب والام ،وتسلسل الطفل في عائلته. وبعد ذالك اجري فحص سريري دقيق عام وخصوصا لجهاز الدوره الدمويه لتحديد وجود اي امراض ولاديه اخرى او علامات لخلل الكروموسومات. أدخل سبعه وستون وليد في هذه الدراسه،سبعه منهم استثنوا من الدراسه بسبب انهم كانوا مبتسرين ،وستون وليدا تم تقيمهم بواسطة اشعة الصدر وتخطيط القلب وفحص القلب بجهاز الايكو الذي اجري لهم من قبل طبيب متخصص بامرض القلب.

وجد في هذه الدراسه بان امراض القلب الولاديه غير الازرقاقيه اكثر من امراض القلب الولاديه الازرقاقيه.

وكانت الفتحه بين البطينين تشكل 35% من الحالات،وناسور القناة الشريانيه26,6%،والفتحه بين الاذنين8,3%،ورباعية فالوت8,3%.وكذالك اثبتت الدراسه ان النفحه غير المصاحبة بأي أعراض هي العرض الطبي الوحيد لاكثر امراض القلب الولاديه عند الولاده.وكذالك اثبتت الدراسه ان درجة القرابه القريبه تعتبر من عوامل الخطوره.

التشخيص المبكر لامراض القلب الولاديه مهم جدا من اجل العلاج المثالي وان الفحص السريري وفحص الايكو الدقيق تعتبران اهم دعامات تشخيص امراض القلب الولاديه.ايكو القلب ذو البعدين كذالك مهم في التشخيص.وكذالك ضرورة انشاء مركز قلب تخصصي في مدينتنا من اجل المعالجه السريعه والدقيقه لامراض القلب الولاديه حتى تعطي نتائج علاجيه أفضل.

*College of Medicine –Al-Qadissiya university

Abstract

Background:CHD in the newborn is a problematic disease that need thorough investigation and may need urgent intervention.

Objective:To review the pattern of CHD in newborns in Al-Diwaniyah city and to establish the relationship between CHD and certain parameters like sex,and consanguinity

Patients and Methods: The study started at 1st of June 2008 till the 1st of January 2010 ,all newborn babies with suspected CHD were included in this study and undergo thorough history with specific attention on prenatal ,natal and postnatal history also questionnaire including sex ,full term or preterm delivery ,any previously affected sibling with CHD, the degree of consanguinity between the parents ,order of the patient in his family , then perfect general and cardiovascular system examination were performed to detect any other congenital or evidence of chromosomal abnormalities .Sixty seven neonates were enrolled in this study (7 of them were excluded because of prematurity)and 60 neonate were evaluated by chest X-ray, electrocardiograph, and echocardiography which done by expert pediatric cardiologist.

Results :In this study we found that acyanotic CHD is more common than cyanotic type with VSD is accounting about 35% of cases followed by PDA 26.6% and then ASD 8.3% and TOF 8.3% ,also the study show that asymptomatic murmur is the commonest presentations of CHD in the newborn and consanguinity may be a risk factor.

Conclusion: Early detection of CHD is very important for proper management so proper clinical examination and expert echocardiography is considered a gold standard for the diagnosis of CHD .Two dimensions echocardiography is also essential for the diagnosis special cardiac center should be established in our region (AL-Diwaniah)in order to manage the patient effectively without delay that may affect the out- come of the disease.

Key words: congenital heart disease, neonate

Introduction

Congenital heart disease (CHD)is the most common congenital problem in children accounting for nearly 25% of all congenital malformations (1). CHD ,in a definition proposed by Mitchell et al is a gross structural abnormality of the heart or intrathoracic great vessels that is actually or potentially of functional significance (2). The incidence of CHD is approximately 8 per 1000 live birth with a higher rate in still birth ,spontaneous abortion and prematurity (3,4). The cause of most congenital heart defects is unknown most cases of CHD are thought to be multi-factorial and result from a combination of genetic predisposition and environmental stimuli (5).

The clinical presentations of CHD varies according to the type and severity of the defect (6).In neonatal period the presenting features of CHD are cyanosis (with or without respiratory distress),heart failure (with or without cyanosis), collapse , and abnormal clinical sign detected on routine examination (i.e absent femoral pulse or a heart murmur)(7). But most cases are asymptomatic and discovered during routine neonatal check-up(8).

CHD not only contribute to a significant morbidity and mortality but also cause a tremendous psychological stress and economical burden to the whole family .However ,if the problem are recognized at earlier age, The chance of long term complications are less and the outcome is better .As a result of improved medical and surgical management ,most children with CHD are surviving into adolescence and adulthood(9).

The aim of the study

To find out the type and clinical presentation of CHD inAl-Diwaniyah maternity and children teaching hospital , and to find sex distribution, and any association with other congenital malformations or chromosomal abnormalities..

Methods

This is prospective study conducted in maternity and children hospital which is the only main hospital in AL-Diwaniyah governorate ,in this hospital there is neonatal intensive care unit which is the main source of our study information .

Also this hospital is the only hospital for referral cases from the surrounding areas (rural areas).The study started at 1st of June 2008 till the 1st of January 2010 ,all newborn babies with suspected CHD were included in this study and underwent thorough history with specific attention on prenatal ,natal and postnatal history also questionnaire include sex ,full term or preterm delivery ,any previously affected sibling with CHD, the degree of consanguinity between the parents ,order of the patient in his family , then perfect general and cardiovascular system examination were performed to detect any other congenital or chromosomal abnormalities .Sixty seven neonate were enrolled in this study (7 of them were excluded because of prematurity)and 60 neonate were evaluated by chest X-ray, electrocardiograph, and echocardiography which was done by expert pediatric cardiologist.

Results

Table 1: During the study period 60 neonate were diagnosed as having CHD ,there were 37 males (61.6%)and 23 females (38.8%).male:female ratio 1.6:1

Table: 1 : Distribution of patients according to gender.

Sex	No.	%
Male	37	61.6%
female	23	38.4%
total	60	100%

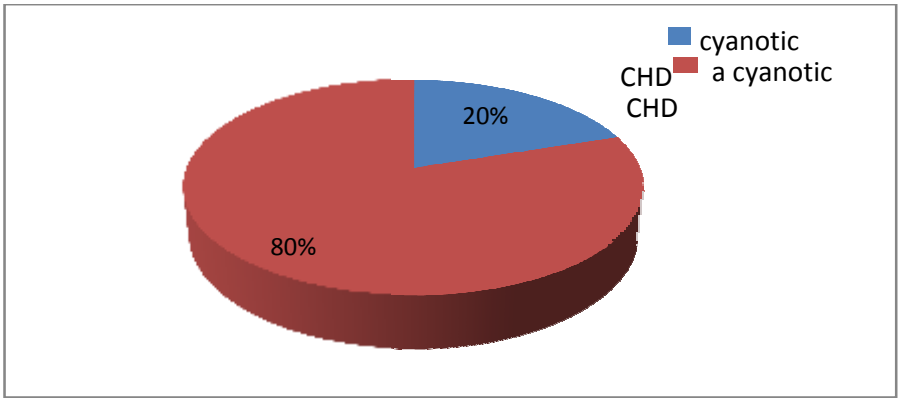

Figure1 : Distribution of patients according to types of CHD.

In the table :2 show that the ventricular septal defect (VSD) is the most common type of all CHD it account about 35% of cases followed by PDA and ASD (26.6%and 8.3%) respectively , TOF is the most common form of cyanotic CHD (8.3%).Other form of CHD whether cyanotic or a cyanotic have the same results(1.6%-3.3%).

Table:2 : The frequency of CHD types.

Cardiac defect	No. of patients	%
VSD	21	35%
PDA	16	26.7%
ASD	5	8.4%
Atrio-ventricular canal lesion	2	3.3%
CoA	2	3.3%
Pulmonary valve stenosis	2	3.3%
TOF	5	8.4%
TAPVR	2	3.3%
TGA	2	3.3%
Tricuspid atresia	1	1.7%
Hypoplastic left heart	2	3.3%
total	60	100%

*VSD=ventricular septal defect,PDA=patent ductus arteiosus,ASD=atrial septal defect,CoA=coarctation of aorta,TOF=tetralogy of Fallot,TAPVR=total anomalous of pulmonary venous return,TGA=transposition of great arteries.

About 21% of CHD were associated with other congenital malformation ,six patients had Down syndrome .cleft lip alone or with cleft palate were present in four patients and three patients had congenital intestinal obstruction.

In table (4):show the commonest clinical presentations of neonate with CHD and it indicate that more than half of the patients are asymptomatic and the heart lesion discovered accidently during routine check-up at the out-patient clinic or in vaccination department, while 13 patients (21.6%)presented with sign and symptoms of heart failure and treated with anti-failure treatment ,seven patients presented with central cyanosis without any other signs or symptoms. Chest infection were the presenting sign of eight patients(13.3%).

Table 4:Signs and symptoms of CHD at the time of diagnosis.

Signs & symptoms	No. of patients	%
Accidentally discovered CHD	32	53.4%
Heart failure	13	21.6%
Cyanosis(alone)	7	11.6%
Chest infection	8	13.4%
Total	60	100%

The study shows that the parents of 34 patients(56.6%)with CHD were close relative(1st cousin marriage)while 26 patients(44.4%)their parents were not relatives, but there is no significant value for the difference between the two groupes at a p_value limit (0.05).

Discussion

CHD are an important group of diseases that cause great morbidity and mortality in children (10).In our study the frequency of acyanotic CHD is 80% and the other 20% is that for cyanotic type. Male newborn were more affected than female in the present study with male: female ratio is 1.6:1 and this result is the same as reported from different countries (12).In this study ventricular sepal defect is the most common CHD (35%) and this consistent with the result of studies done in Saudi Arabia(13.14) also other studies show that the frequency of VSD is 25-30%(11).in the present study ,PDA accounting about 26% and this result is higher than other results done in Saudi-Arabia and Jordan(15.16).

The following table shows the percentage of CHD of the present study with other studies throughout the world:

Type of CHD	Present study	Saudi-arabia(15)	Jordan (16)	Canada (13)	California (23)	Australia (24)	Taiwan (19)
VSD	35%	32.5%	43.4%	34.4%	31.3%	28.2%	39.3%
PDA	26.6%	15.8%	8.3%	10.8%	5.5%	15.4%	9.8%
ASD	8.3%	10.4%	13.6%	10.5%	6.1%	13.4%	5.3%
A-V canal lesion	1.6%	3.6%	3.6%	4.4%	3.7%	-------	------
CoA	3.3%	3.3%	3.4%	-------	5.5%	5.1%	1.1%
PV stenosis	3.3%	10.1%	6.2%	-------	13.5%	14.2%	2.5%
TOF	8.3%	4.5%	9.5%	10.2%	3.7%	7.3%	12.3%
TAPVR	3.3%	0.6%	------	-------	0.6%	14.9%	-----
TGA	3.3%	1.5%	5.5%	5.1%	3.7%	5.1%	5.3%
Tricusped atresia	1.6%	1.5%	3.6%	------	-------	------	-------
Hypoplastic left heart	3.3%	0.3%	--------	--------	0.6%	------	-------

*VSD=ventricular septal defect,PDA=patent ductus arteiosus,ASD=atrial septal defect,CoA=coarctation of aorta,PSstenosis=pulmonary valve stenosis TOF=tetralogy of Fallot, TAPVR=total anomalous of pulmonary venous return TGA=transposition of great arterie.

ASD in our study is less than other reports throughout the world as shown above and this difference may be due to that ASD usually remain asymptomatic during neonatal period and are diagnosed in

adulthood .In this study the incidence of CoA were the same as in developing countries (13.17) but it is less than that in the developed countries (18) and this may be suggested a probable explanation related to certain vitamins deficiency (19) .We believed that it might also related to the later diagnosis of this entity in late adolescence .

Among cyanotic CHD ,TOF was the commonest cyanotic CHD followed by TGA with percentage of 8.3% and 3.3% respectively and this comparable to other studies in the world(11.15).In this study the most common congenital valve lesion is pulmonary valve stenosis (3.3%) and this frequency is lower than that reported from other countries (13)and this may explain by racial variation,ethinic and social factors in various parts of the world or different geographical, nutritional ,and socioeconomic factors.

We found female neonate predominant in PDA and A- V canal in 62% and 65% respectively in our study ,and this is consistent with that reported by Kenna in Liverpool (20) while male patient were found more frequent in VSD,TOF,and single ventricle and this also consistent with that reported by Mollah et al study(21).

In this study ,we note that there is association of CHD with other congenital malformations ,six patients have Down syndrome and many other patient have cleft lip and palate or with cleft lip alone .Three patients also have congenital intestinal obstruction and this may be due to multifactorial etiology of CHD(22)

Our result indicate that most neonatal CHD were present in consanguineous parents (56.6%) and particularly in first cousin marriage and this may be due to increase the rate of consanguineous marriage in AL-Diwaniyah region because of cultural ,religious ,and believes factors in most Iraqi society.

Conclusions

Most of CHD were asymptomatic at the time of diagnosis and diagnosed at routine clinical examination of newborn baby.

Many of CHD associated with other congenital malformation like cleft lip and palate, congenital intestinal obstruction and Down syndrome.

Recommendations

1.All newborn babies should be examined thoroughly for any evidence of CHD and follow-up examination should be advised especially in our country because this routine examination to all newborn baby usually not done..

2. Early detection of CHD is very important for proper management, so proper clinical examination and expert echocardiography is considered a gold standard for the diagnosis of CHD .Echocardiography is also essential for the diagnosis.

3.Special cardiac center should be established in our region (AL-Diwaniyah)in order to manage the patient effectively without delay and according to the recommendations of the American Academy Of Pediatric ,pediatric cardiac center should be available for population that generate 30000 live/year(23).

4. Primary preventive programs should be initiated to reduce CHD this preventive measures include treatment of maternal illnesses like D.M,and rubella,and avoidance of unnecessary medication during pregnancy unless absolutely indicated, enhance good nutritional program during pregnancy.

5.Enhancement of prenatal screening and diagnosis of CHD is a priority.

References

1.Aburawi E.The burden of congenital heart disease in Libya. Libyan J. Med ,Apo. Page 60 ; 2006

2.Mitchell S.C,Korones S.B and Berendes H.W,Congenital heart disease in 56,109 birth .Incidence and natural history .Circulation 43(1971),pp 323-332.

3.Fyler DC,Buckley LP,Hellenbrand WE,Cohn HE. Report of the new England Regional Infant Cardiac Program .Pediatric,1980;65 suppl:375-461.

4.Jordan S.C,Scoll O.Heart disease in pediatric .London:Butterwoths,1989:38.

5.Abdulla R.What is the prevalence of congenital heart disease ? Pediatric cardiology 1997;18:268.

6.Malik A.Congenital and acquire heart disease .A survey 7,062 person,Bangladesh Medical Research Council Bulletin 2:115,1976.

7.Kitchine DJ,Cardiovascular disease .IN:Mclntoch N,Helms PJ.Smyth RL,6th ed.Forfor &Arnneil s Textbook of Pediatrics.Edinburgh:Churchill Livingstone, .2003;725-872
8.Kuehl KS,Loffredo CA.Ferencz C.Failure To Diagnosis Congenital Heart Disease In Infancy.Pediatrics 1999;103:743-7,
9.Camm AJ,Bunce NH,Cardiovascular disease.In K ummer P,Clark M,6th ed, Kummer &Clark Clinical Medicine.Edinburg:Elsevier Saunders,2005;725-872.
10.Al-abdulgader A.Congenital heart disease in 740 subjects:Epidemiological aspects .Ann Trop Pediatrics 2001;21:111-8.
11.Behrman- Nelson Textbook Of Pediatric .17th ed .2004:1499-1502
12.Stevenson AC,Congenital heart disease . A report study of series of consecutive birth in 24 centers .Bulletin of the WHO ,1996,34(suppl):9-27.
13.Jaiyesim F,Rubern DK,Misra VK.Pattern of Congenital heart disease in King Fahad special Hospital of Buraidah .Ann Saud. Med 1993;13:407-11
14.Bhat BA,Abdul Mteen S,Khan A,Dad MI.Pattern of Congenital heart disease among children in Madina Munawara .J Saudi Heart Associ 1997:16-9
15.Abbag F.Pattern of Congenital heart disease in the southwestern region of Saudi Arabia. Ann Saudi Med 1998;18:393-5
16.Khled A.Pattern of congenital heart disease in Jordan .European J of General Medicine 2009;6(3):161-165/
17.Venugopalan P,Agarwal AK.Johnston WJ,Riveria E.Spread of heart disease seen in an-access Pediatric cardiology clinic .Int J Cardiol 2002;84:211-6
18.Pradat P.Epidemiology of major congenital heart defects in Sweden ,1981-1986. J Epidemiology Community Health 1992;46:211-5.
19.Shann M.MB. Congenital heart disease in Taiwan ,Republic of China.Circulation 1969:49.
20.Kenna AP,Smithells RW,Fielding DW,Congenital heart disease in Liverpool:Q J Med 1975;44:17-44

21.Mollah MAH,Begum NA,Islam MN,Mahmud RS,Nahar N,et al.Clinical profile of Congenital heart disease :an analysis of 218 cases .Bangladesh heart J 2002; 17 : 62-67

22. Longmore, Murray; Oxford Textbook Illustrated Companion to Medicine , 2001 .pp 146-150

23.Moodie D.Task Force 6:aPediatric Cardiology Journal of the American College of Cardiology ,1994;24(2):322-8.

24. Tofler OB. Congenital heart disease in aboriginals. Med J Aust 1979;1:620.