PREVALENCE AND PATTERN OF CONGENITAL HEART DISEASE IN HAZARA

MUMTAZ KHAN BURKI, GHUFRAN SAEED BABAR

Department of Paediatrics, Ayub Medical College, Abbottabad

Background: The incidence and particularly the pattern of congenital heart disease may vary in different geographical locations, but the extent to which such reported variations are attributable to differences in genetic predisposition, environmental factors, or in study methodology and diagnostic precision remains uncertain. There is. therefore, a continuing need for studies on various aspects of congenital heart disease, in different communities and races. *Methods:* This study was done on 188 consecutive cardiac patients reporting at Ayub Teaching Hospital, Abbottabad, Pakistan from June 1998 to June 2000. ***Results:*** 114 of 188 cardiac patients studied had congenital heart disease. Both sexes were equally affected. Ventricular septal defects were the most common lesions (relative frequency 61.4%), followed by Tetrology of Fallots, ASD and PDA with a relative frequency of 8.77%. The detection rate under one month was 28.07% and at one year 75.43%. ***Conclusion:*** There is therefore, a need for increased awareness, especially among primary health and other front line doctors for earlier case detection.

INTRODUCTION

There are several reports that suggest that the incidence and particularly the pattern of congenital heart disease may vary in different geographical locations[1"6], but the extent to which such reported variations are attributable to differences in genetic predisposition, environmental factors, or in study methodology and diagnostic precision remains uncertain[7"13]. There is, therefore, a continuing need for studies on various aspects of congenital heart disease, in different communities and races. We have accordingly undertaken a clinical prospective study of CHD as seen in patients presenting in Ayub Teaching Hospital, Abbottabad. This present report, which embodies our findings, aims to provide an overview of CHD in this part of the country.

MATERIAL AND METHODS

188 cardiac patients were studied in Ayub Teaching Hospital, Abbottabad between a 2 years' period from June 1998 to June 2000. The patients were a consecutive series. Every one of them was examined thoroughly. In each case the diagnosis was based on findings at physical examination, standard chest radiography. E.C.G. and echocardiography (Doppler). The results were analyzed to give the prevalence and pattern of congenital heart disease.

RESULTS

During the 24 months' period 114 patients of the total 188 cardiac patients studied were of congenital heart disease. Those of congenital heart disease comprise d (114 188) 60.63% of the total. The balance was made up of Rheumatic heart disease (48/188) 25.53% Myocarditis (18/188) 9.57% and miscellaneous cardiovascular disorders (8/188) 4.25%).

The various defects recognized in the patients are shown in table-1 alongside data relating to American, European, Nigerian and Japanese children, quoted in discussion.

As in other parts of the world ventricular septal defect was the most common lesion.

The spectrum of complex defects included the dextrocaradia, tricuspid atresia, dextrocaradia with pulmonary stenosis, single ventricle and a combination of atrial septal defect and ventricular septal defect.

Table-3 shows the sex distribution of the defects. Ventricular septal defects, ASD and PDA were common among the boys. While pulmonary stenosis was common among the girls. Other defects were found to be equal in both sexes.

Table-4 shows the age at which the children was detected to have congenital heart disease. The cumulative detection frequency was 28.07% and one i month and 75.43% at twelve months respectively.

There was one case of FT where mother was positive for TORCH infections. There were three cases of VSD with Down's syndrome. No specific etiological factor was identified in rest of the cases.

DISCUSSION

Hospital based studies, by virtue of their it built selection factor, seldom reflect the precise community pattern of any disease. Our present study is no exception; but there is a mitigating factor. Urge cardiac centres with facilities for cardiovascular surgery see mostly patients who are considered by the [1] reform - physicians to be deserving of consideration for cardiovascular surgery or similar specialised in management. Their materials will therefore be tilted in favour of the severe malformations. By contrast, our patients are minimally selected since all children with known or suspected heart disease, no matter how trivial or severe are referred to us. The data presented in this report, therefore, probably approximates the true pattern of congenital heart disease in this region.

Table-1: Relative prevalence of various cardiac defects in different countries

Defect	EUROPE/USA (11) (N=3104)	Liverpool/UK (5) (N = 884)	Nigeria (5) (N=635)	Japan (14) (N=773)	Present study %
Ventricular septal defect (VSD)	30.3	32.5	35	60	61.40
Atrial septal defect! ASD)	6.7	5.9	7.5	5.3	8.77
Pulmonary Stenosis(PS)	7.4	7.6	9	9.6	3.50
Patent Ductus Arteriosus(PDA)	8.6	11.9	22	3.6	8.77
Fallot Tetralogy (F/T)	5.1	5.9	10	5.8	8.77
Atrioventricular Cannal defects (AVCD)	NS	2.4	NS	1.8	NS
Transposition of great arteries (TGA)	4.7	5	4.5	2.2	1.75
Aortic stenosis(AS)	5.2	5.1	0.6	1	NS
Coarctation of aorta	5.7	6.3	2	2.7	1.75
Others	26 3	17.4	9.4	9.5	5.26

NS = Not Stated

Table-2: Cardiac cases from June 1998 - June 2000 in Ayub Teaching Hospital, Abbottabad

Type of Disease	No of Cases	Percentage
Congenital Heart Disease	114	60.63
Rheumatic I lean Disease	48	25.53
Myocarditis	18	9.57
Miscellaneous Cardiovascular Diseases	8	4.25

TABLE-3: SEX DISTRIBUTION OF VARIOUS DEFECTS

DEFECT	TOTAL NO	MALE	FEMALE	M/F RATIO
VSD	70	37	33	37/33=1.12
FT	10	5	5	5/5 = 1
ASD	10	6	4	6/4= 1.5
PDA	10	7	3	7/3=2.33
PS	4	1	3	1/3=0.33
TGA	2	1	1	1/1 = 1
AS	-	-	-	-
ARC	2	1	1	1/1 = 1
OTHERS	6	3	3	3/3 = 1
TOTAL	114	61	53	61/53 = 1.15

VSD =Ventricular septal defect, FT Fallots tetralogy, ASD=Atrial septal defect, PDA=Patent ductus arteriosus PS=Pulmonary stenosis, TGA-Transposition of great arteries, AS=Aortic stenosis, ARC=Coarctation of aorta

TABLE-4: AGE OF DETECTION.

AGE (Wk./Mo)	VSD	ASD	PDA	TGA	CO ARC	PS	FT	OTHERS	TOTAL(%)
Below 1 week	20	3	4	-	|	1	2	2	32=28.07
1 -4 weeks	9	2	1	2	-	1	2	2	13=11.40
1-3 months	15	1	1	-	-	•	4	1	22=19.29
3-12 months	10	3	3	-	-	2	1	1	20=17.54
Over 12 months	23	2	1	-	2	-	-	-	28=24.56

The next point that we would like to discuss relates to the prevalence of the individual cardiac lesions. The belief that regional variations may occur in this regard is reinforced by the results of two large studies EUROCAT collaborative study[6] and its Japanese counterpart.[14] In the EUROCAT study, which involved participate team from seven European countries, the incidence of congenital heart disease ranged from 5.0 per 1000 in Glasgow, U.K. to 10.5 per 1000 in st rasboury, France. Ventricular septal defect was the most common single defect with a mean prevalence rate of 36%. However, the rates varied between centres, being highest in those centres w if h high CHD incidence rates in the fa pan esc study on the other hand, the incidence of CHD was 10.6 per 1000, and ventricular septal defect was detected in 60% of the patients.

A comparison of our findings with above and other reports (Table-1) reveals several similarities as well as some notable differences. Firstly, ventricular septal defect was the commonest congenital heart disease detected with a relative prevalence rate of 61.40%.

As stated earlier the precise causes of these regional variations are uncertain, but reasons advanced to explain them include differences in study methodology, differing genetic predisposition[11,13,16] and variations in fetal calcium bioavailability[4] and other environmental factors.[12,15] These reasons are not mutually exclusive. Besides, they can also be reconciled with the multifactorial inheritance theory, advocated by Nora and Nora,[13] which provides a flexible and very plausible explanation.

Another factor which should be kept in proper perspective is the fact that the number of patients in our study is smaller than those in the other studies cited. This may or may not have affected the observed differences in the relative prevalence of some of the cardiac defects. This uncertainly underscores the need for a nationwide multicenter study on cardiac malformations. Such a collaborative study', if appropriately designed, will also yield much needed data on the incidence of the disease and thus facilitate national decision making, especially with regard to the provision of appropriate care facilities.

Closely linked with the issue of regional variations is the question of etiology. In this present study, as in several others, [4,5,15,17]no etiological factors were found in majority of the patients.

As stated above, trisomy 21 was the most common single etiological factor, having been detected in 2.63% of our patients. This also resembles the mean rate of 5% reported from other countries[2,4,17,19] and appears to be related to the relatively advanced age of the mothers of the affected children.

One other remarkable finding in this study relates to the age at which the CHD was detected. Eighty-two percent of the patients studied in Blackpoll, UK by Bound and Logan had been diagnosed by one year; in Denmark and Liverpool, the detection rates at age six months were 63% and 76%, respectively.[2] In the present study just 75.43% of the patients had been detected by the age of one year.

There is clearly a need to intensify the measures that will aid in the early detection and referral of children with CHD. We therefore urge that all children who come into contact with doctors, be it at birth, at postnatal checkups, during the mandatory immunization visits, or during an inter current illness, be carefully examined for the presence of CHD. It will cost so little: just a high level of awareness, patience and some diligence. But the potential benefits, in terms of timely detection and treatment, and the attendant reduction in morbidity and mortality, will be immense.

REFERENCES

1. Mitchel SC. korones SD. Berendes HW Congenital heart disease in $6,609 births incidence and natural history. Circulation 1971. (a 43 323-32
2. Bound JP, Logan WF Incidence of congenital heart disease in Blackpoll (1957-1971) Brit Heart J 1977. 39-445-50
3. McLaren MJ. 1achman AS. Barlow JB Prevalence of congenital heart disease in black school children in sow? to. Johannesburg Brit Heart J 1979.41 554-8
4. Jaiyesimi F. Antia AV Congenital heart disease in Nigeria a ten-year experience in UCH. Ibadan Ann Trop Ped 1981: 77-85.
5. Dickinson DF. Arnold R. Wilkinson JL Congenital heart disease among 160.480 live born children in Liverpool. 1960-1969. Bnt Heart J 1981,46:55-62
6. Penieder T. Bloch D. Beuret A. Eurocrat collaborative study on congenital heart disease. 1986 data Abstracts of 3'"* symposium on etiology and morphogenesis of congenital heart disease. Tokyo. Japan 1988. 103-4
7. Ongley PA Pediatric cardiology in Thailand Circulation 1966; 34.1-3
8. Hernandez FA. Miller RH. Schieber Gl. Rarity of coarctation of the aorta in the American Negra J Pediatrics 1969. 74 623-5
9. Maron BJ, Apple field JM. Krovetz LJ Racial Christian in congenital heart disease Circulation 1973: 47 359-61
10. 10 Hoffman J1E, Christianson R Congenital heart disease in a cohort of 19.502 births with long term follow up Amer J Cardiol 1978;42:641-7
11. Ellison RC Epidemiological contributions to the etiology and prevention of congenital heart disease In- Pediatric cardiology. Vol 4; Godman MJ, ed Churchill Livingstone, Edin 1981; 6-13
12. Burn J The etiology of congenital heart disease. In Pediatric cardiology, Anderson RH, McCartney FJ, Shine Bourne EA. Tynan M, eds. Churchill Livingstone. Edin 1987; 16-63.
13. Nora JJ. Nora AH. Etiology of congenital heart disease revisited abstracts of 3rd symposium on etiology and morphogenesis of congenital heart disease Tokyo. Japan 1988. 99-100
14. Nakazavva M. Sequcht M. Takao A Prevalence of congenital heart disease in Japan. Ibid 1988. 105-6.
15. Lawrsen HB Some epidemiological aspects of congenital heart disease in Denmark. Acta Pediatr Scand 1980. 69:619-24.
16. Dennis NR Genetic aspects of congenital heart disease. In: Pediatric cardiology Vol.4: Godman MJ. ed Churchill Livingstone. Edin 1981. 14-23
17. Mitchell SC. Sellmann AH, Westphal MC Park J Etrologic correlates in a study of congenital heart disease m 56. 609 births Amer J Cardiol I97l:(b) 28 653-7
18. Greenwood RD. Rosenthal A, Parisi L, et al., extra cardiac anomalies in infants with congenital heart disease Pediatr 1975:55.485-92.
19. Kenna AP Smithells RW. Fielding DW Congenital heart disease in Liverpool. 1960-1969 Quart J Med 1975,55:485-