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Congenital Heart Diseases at the University of Benin Teaching Hospital

MO Ibadin *, WE Sadoh **, W Osarogiagbon***

Abstract

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Background: Most of the previous reports on childhood congenital heart diseases (CHD) in Nigeria antedated the era of echocardiography. The advent of widespread use of echocardiography enables a more accurate and complete identification of CHD in children. A study using echocardiography to determine the prevalence and pattern of CHD in the University of Benin Teaching Hospital (UBTH), Benin City at this time, would be informative.

Methods: Patients presenting with CHD to the paediatric health facilities of UBTH between June 1995 and February 2004, were prospectively enrolled in the study. They were evaluated with chest radiographs, electrocardiograms and echocardiograms.

Results: Forty nine of the 10,549 (4.6/1000) children who presented to the hospital during the period under review had CHD. There was no significant gender difference. The mean age at presentation was 2.6 ± 3.5 years. Most of the patients were aged one year of age and below. Isolated ventricular septal defect (VSD) in 27 (55.1 percent) was the most frequent defect, followed by tetralogy of Fallot in 14 (28.6 percent); the other anomalies were atrial septal defect (ASD) and VSD in four (8.1 percent), patent ductus arteriosus and VSD in two (4.1 percent), and isolated ASD in two others. There were more patients from the low and middle socioeconomic classes than those from the high socioeconomic class (Fisher 's exact test, P = 0.66).

Conclusions: The health seeking behaviours of the communities, which entails visiting trado-medical practitioners and churches rather than the hospital, may have accounted for the low prevalence of CHD found. The use of echocardiograms in the nurseries and routine screening of patients for CHD is advocated to allow for early detection and intervention. Health education and public enlightenment would also improve the health seeking attitude in the study locale.

Key words: Congenital heart disease, Children, Benin-City

Introduction

CONGENITAL heart diseases contribute appreciably to childhood morbidity and mortality worldwide but more so in developing countries where facilities for their modern management are often lacking. They could be life-threatening in early childhood.[1-3] Early recognition and appropriate intervention may be life saving in some cases while in others, they could mitigate the morbidity burden.[4] The widespread use of echocardiography has facilitated improved description of congenital heart diseases (CHD) and their early diagnosis.[5]

Previous studies on the epidemiology of congenital heart diseases have shown that the most frequent lesions are ventricular septal defect (VSD), atrial septal defect (ASD) and patent ductus arteriosus (PDA). Incidentally, these are also the types that could be managed medically or expected to correct themselves spontaneously.[1-3,6] The prevalence of congenital heart diseases is influenced largely by the environment surrounding the parturient

University of Benin Teaching Hospital, Benin City

Department of Child Health
* Senior Lecturer/Consultant
**Lecturer I/Consultant
*** Senior Registrar

* Corresponding author

mother and to this extent, usually varies from place to place. The widespread use of echocardiography facilitates more detailed and correct description of structural lesions. A previous report of CHD from Nigeria antedated the era of echocardiography.[3] It would therefore be of interest to further determine its prevalence using echocardiography. This study was undertaken to determine the pattern of congenital heart diseases at the University of Benin Teaching Hospital (UBTH), Benin City, mid-western Nigeria.

Patients and Methods

Patients presenting with congenital heart diseases to the in-patient paediatric health facilities of UBTH from June 1995 to February 2004 were prospectively enrolled in the study. The patients who presented with features suggestive of congenital heart diseases were further evaluated with chest radiographs, electrocardiograms and echocardiograms. All the investigations were carried out at UBTH. The electrocardiograms were obtained using *Schiller AT-1 Smart Print* machine standardised at paper speed of 25mm/second. The chest radiographs were performed by radiographers and the films read by a consultant radiologist in conjunction with the attending paediatrician. Echocardiograms were obtained with a *Sono Ace* machine and interpreted by the cardiologist. All the patients who underwent these procedures and in whom congenital heart disease was confirmed, were included in the study. The patients with suspected CHD who could not be fully evaluated were excluded. The socio-economic classes (SEC) of the patients were determined using the scoring system designed by Olusanya *et al.*[7]

Statistical tool

Association between proportions were tested using Chi square test. Differences were considered significant if $P < 0.05$.

Results

During the period under review, 10,549 children aged 16 years and below, presented at the hospital for various ailments. Of these, 49 children were diagnosed as having congenital heart diseases, thus resulting in a prevalence of 4.6/1000. There were 25 (51 percent) females and 24 (49 percent) males. Their ages at presentation ranged between 12 days and 16 years with a mean of 2.6 ± 3.5 years. Of the 49 patients, two (4.1 percent) were neonates, 23 (46.9 percent) were aged between one month and one year while the remaining 24 (49.0 percent) were over one year old (Table I).

The distribution of the congenital anomalies is shown in Table II. The most frequently encountered condition was isolated ventricular septal defect (VSD), which was present alone in 27(55.1 percent) of the patients. It was followed by tetralogy of Fallot (TOF; the only cyanotic congenital defect seen) in 14 (28.6 percent). Ventricular septal defect was present in combination with other anomalies in six cases; in four (8.1 percent) it was associated with atrial septal defect (ASD) and in two others (4.1 percent), with patent ductus arteriosus (PDA). The other anomaly was isolated ASD in two (4.1 percent) cases. There was no case of isolated PDA. The two children with associated PDA were born at term and were aged two and nine months respectively, at presentation. One patient with VSD also had clinical features of Down syndrome.

The most common presenting complaints were difficulty in breathing, cough, fever, and fatigue in 37 (75.5 percent), 28 (57.1 percent), 19 (38.8 percent) and 16 (32.7 percent) patients, respectively (Table III). Complications occurred in patients with TOF and VSD. Of the 14 patients with TOF, three (21.4 percent) had polycythaemia, requiring partial exchange blood transfusion and another three (21.4 percent) had hypercyanotic spells warranting admission. Twelve (36.4 percent) of the 33 patients with VSD had at least, one episode of bronchopneumonia with or without

Table I

Age and Gender Distribution of Patients with Congenital Heart Diseases

Gender	*Age (months)*			*Total*
	0 – 12	*13 – 59*	*60 – 192*	
Males	14	5	5	24
Female	11	8	6	25
Total	25(51.0)	13(26.5)	11(22.5)	49(100)

Figures in parenthesis represent percentages

$\chi^2 = 1.12$, df = 2, P = 0.57

Table II

Types of Congenital Heart Diseases by Gender

Type of CHD	*Females*	*Males*	*Total*	*% of CHD Cases*
Isolated VSD	15	12	27	55.1
TOF	6	8	14	28.6
VSD + ASD	1	3	4	8.1
VSD + PDA	2	0	2	4.1
Isolated ASD	1	1	2	4.1
Total	25	24	49	100.0

VSD = Ventricular septal defect; TOF = Tetralogy of Fallot

ASD = Atrial septal defect PDA = Patent ductus arteriosus

$X^2 = 3.6$, df = 4, P = 0.46

Table III

Presenting Complaints in Patients with CHD

Symptoms	*Number of Patients n=49*	*% of Total*
Difficult breathing	37	75.5
Cough	28	57.1
Fever	19	38.8
Fatigue	16	32.7
Poor weight gain	12	24.5
Fast breathing	12	24.5
Dark coloured lips	6	12.2
Excessive crying	3	6.1
Dizziness	2	4.1
Palpitation	1	2.0
Chest pain	1	2.0

Table IV

Family Socio-economic Classes of 40* Patients with CHD

	Number of Patients		
Socio-economic Class	*Males*	*Females*	*% of Total*
High	2	4	15.0
Middle/ Low	17	17	85.0
Total	19	21	100.0

Fisher's exact test, P = 0.66

*Information from the records of nine patients was insufficient to determine their socio-economic status

congestive heart failure that necessitated in-patient care. Thirty six (73.5 percent) of the patients were lost to follow up, 10 (20.4 percent) are being followed in the outpatient clinic, while three (6.1 percent) died from severe pneumonia or congestive cardiac failure.

The distribution of patients by socio-economic class (SEC) is shown in Table IV. The SEC of nine patients could not be determined because of inadequate information. There were more patients from the low and middle SEC (85.0 percent) than those from the high SEC (15.0 percent). This difference was however, not statistically significant. (Fisher's test, $p < 0.66$).

Discussion

The prevalence of CHD in the study was lower than what had been documented in other hospital-based studies.[1,3,8] This may be due to the varied health seeking behaviour of the communities involved. Consulting traditional medical practitioners and churches before seeking help in the hospital is the norm in the study locale. Oftentimes, the patients die before reaching the hospital. The use of echocardiography in nurseries, [9] and routine screening of patients for CHD, which would have identified cases of CHD were not practised in the centre. Thus, the current figure may be lower than the true prevalence.

Only 4.1 percent of the study population presented at less than one month of age. This is lower than the percentages noted in other studies.[8-10] This might not be unconnected with deliberate efforts at excluding babies in the newborn units. It may also suggest late presentation to hospital, a phenomenon that has been noted with other morbidities in Nigeria.[11] However, our finding that 51 percent of the patients presented to the hospital before the age of one year, was similar to findings elsewhere.[8,10] Delayed onset of symptoms and/or worsening of symptoms of the defects may have contributed to this pattern of presentation.

Ventricular septal defect as the most frequent anomaly, has been documented previously.[2,3,6,8-10] However, the next most frequent anomaly recorded in the study was TOF, a cyanotic anomaly. This is at variance with observations in many previous studies where ASD and PDA were reported as the next most frequent anomalies.[6,8,10,12] It is however, similar to findings in a study at Ibadan,[3] where TOF was a common presentation, accounting for 10 percent of the cases of congenital heart diseases. Most cases of ASD are asymptomatic in children;[13] this might have led to the low prevalence recorded in this study. The ASD becomes more apparent when it occurs in association with defects such as VSD, PDA;[13] this was also the case in our study.

Although genetic and environmental factors have been associated with the incidence of CHD,[14] previous studies relating the socio-economic status of the family to the prevalence of CHD were not available to us. In this study, more patients with CHD were from low and middle SEC as compared to those from high SEC. It is possible that some environmental factors yet unidentified, but common in low socio-economic families may be contributory to the development of CHD. It is speculated that such factors may be related to the herbal medicines to which mothers in the low SEC are exposed to during the antenatal period.

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