ORIGINAL ARTICLE

Structural Heart Diseases In Nigerian Children

* M. O. Asani FWACP, ** M. U. Sani FWACP, ** K. M. Karaye MSc, MWACP,
* S. I. Adeleke FWACP, * U. Baba MBBS.
Department of * Paediatrics, and ** Medicine, Aminu Kano Teaching Hospital, Kano, Nigeria.

ABSTRACT

Background: *Cardiovascular diseases both in adults and children constitute a major public health problem and structural heart diseases are an important group of disorders in children worldwide. The pattern of this group of disorders however, varies between regions and countries and even within countries. Recognizing the structural cardiac conditions that prevail in a particular area is important in health planning and for improving health care services. The present survey sets out to describe the pattern of structural heart diseases among children in Aminu Kano Teachig Hospital, Kano from our echocardiography data.*

Methods: *The echocardiographic reports of all children seen in Aminu Kano Teachig Hospital, Kano between August 2002 and September 2004 (24 months) were reviewed. Information obtained from the records includes age, gender, clinical diagnosis and echocardiographic findings. Data was analyzed using SPSS version 10.0 software.*

Results: *A total of 108 children, aged between two weeks and eighteen years, were referred for echocardiographic examination in the 2- year study period. Of these, 88 had an abnormal echocardiogram. There were 55 boys and 31 girls, giving a male and female ratio of 1.8:1. Congenital heart diseases accounted for 55 (62.5%) of the studied subjects while acquired heart diseases were responsible for 33 (37.5%). Isolated ventricular septal defect (VSD) was the commonest congenital heart disease. Rheumatic valvular heart diseases were the commonest acquired structural heart disease.*

Conclusion*: With the establishment of tertiary healthcare institutions in Nigeria, availability of echocardiographic facilities as well as increasing number of Paediatric cardiologists, more of these cases are likely to be seen in the future. There is an urgent need for the government to establish a well equipped cardiothoracic surgical centre to cater for these patients either free or at highly subsidized rates.*

KEY WORDS: *Children; Nigerian; Heart disease; Structural*

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INTRODUCTION

Cardiovascular diseases are of increasing public health importance in many countries. They are no longer diseases of the developed world only, but have become a cause of growing concern in the less developed countries as well[1]. Gupta and Antia[2] estimated the incidence of congenital heart defects in Nigeria to be 3.5 per thousand. This value is high considering the rate of deliveries in the country. Due to inadequate diagnostic facilities, only a minority of cases are detected, and that at late stages of the diseases[3].

The recent acquisition of an echocardiographic facility and establishment of a paediatric cardiac clinic in Kano has brought to the fore, cases of cardiovascular diseases among children in the North western part of Nigeria.

We set out to describe the pattern of structural heart diseases seen among children in the Aminu Kano Teachig Hospital, Kano, using echocardiographic data.

PATIENTS AND METHODS

This is a retrospective study of the echocardiography data collected over 24 months period. Between September 2002 and August 2004, we reviewed the echocardiographic diagnosis of all children aged 2 weeks to 18 years, referred for echocardiography. The patients were examined at the echocardiography laboratory of Aminu Kano Teaching Hospital, Kano. This laboratory receives referrals from other hospitals and clinics in Kano as well neighbouring states such as Jigawa, Katsina and Yobe.

Echocardiography over the 24 months period was carried out using HDI 1500 Ultrasound system, by ATL Ultrasound, manufactured in June 2000. The machine has facility for M-Mode, 2D, Colour flow mapping and Doppler studies. All measurements were done using 5 MHz sector transducer according to the recommendations of the American Society of Echocardiography (ASE)[4,5].

Information obtained from the records include age, gender, clinical diagnosis and echocardiogram findings. Data was analyzed using SPSS version 10.0 software.

RESULTS

A total of 108 children were referred for

Correspondence to: Dr M.O. Asani

echocardiographic examination in the 2 year study period. Of these, 88 had an abnormal echocardiogram. There were 55 boys and 31 girls, giving a male and female ratio of 1.8:1. Table I shows the age and gender distribution of the study subjects. The age range is between two weeks and eighteen years, with a mean age of 5.8 ± 5.41. The subjects included a two weeks old neonate and an 18 year old adolescent.

The number of boys affected are more than three times the number of girls among those under the age of five years, thereafter the sex ratio is about the same. Fifty-five (62.5%) of the children are 5 years and younger.

The clinical diagnosis were in order of occurrence, acyanotic congenital heart disease 41/88 (46.6%), rheumatic valvular heart disease 29/88 (33%) and cyanotic congenital heart disease 18/88 (20.5%).

Congenital heart diseases accounted for 55 (62.5%) of the studied subjects while acquired heart diseases were responsible for 33 (37.5%). Isolated ventricular septal defect (VSD) was the commonest congenital heart disease accounting for 27/55 (49%) of the congenital heart diseases. There were one case each of congenital tricuspid incompetence, mitral incompetence and mitral stenosis. All the three cases were proven by Doppler echocardiography and the patients were aged less than 6 months.

Rheumatic valvular heart diseases are the commonest acquired structural heart disease. They are responsible for 26/33 (78.9%) of the acquired heart diseases described in this study (Table II).

Table III shows the pattern of valvular involvement among patients with rheumatic heart disease. Mitral incompetence was the commonest finding accounting for 21/26 (81%) of the valvular lesions.

Table I. Age and Gender Distribution Of Subjects.

Age Group (Yrs)	Sex		Total (%)
	Male	Female	
≤1	20	7	27(30.7)
1-5	22	6	28(31.8)
6-12	7	8	15(17.1)
≥13	8	10	18(20.4)
Total	57	31	88(100)

Table II. Categories of Structural Heart Diseases

Type	No	% of total
Ventricular septal defect	27	30.8
Atrial septal defect	6	6.8
Tetralogy of Fallot	15	17.1
Pentalogy of Fallot	1	1.1
Tricuspid incompetence (congenital)	1	1.1
Mitral incompetence (congenital)	1	1.1
Mitral stenosis (congenital)	1	1.1
Complex heart defects	3	3.4
Rheumatic valvular disease	26	29.5
Cardiomyopathy (Dilated)	7	8.0
Total	88	100.0%

Table III. Valvular Involvement In Rheumatic Heart Disease

Lesion(s)	No	% of total
Mitral incompetence	21	80.7
Mitral incompetence and stenosis	2	7.7
Mitral and aortic incompetence	1	3.9
Mitral stenosis	2	7.7
Total	26	100

DISCUSSION

This study has highlighted the spectrum of structural heart diseases in North Western Nigeria. The preponderance of boys over girls is similar to what was obtained in several studies elsewhere[6,7]. The gender difference is remarkable among the under fives, a period where congenital lesions play the most significant roles. The reason why boys are three times more affected is not clear.

Ventricular septal defect accounts for 30.8% of structural heart diseases making it not only the commonest congenital heart defect but also the commonest structural heart disease in children. This finding is in agreement to other studies done in Nigeria and other countries [6-10]. In this series two patients were able to afford surgical closure. One had VSD repair abroad but the other one had a Maladie de Rogers type of VSD, the size of the defect being too small to warrant surgical intervention. The vast majority had to contend with conservative management. The clinical course of ventricular septal defects depends on the size of the defect and the pulmonary vascular bed, both of which can change with time. Unlike atrial septal defects, spontaneous closure of ventricular septal defects can occur and does so as a function of native defect size, anatomy, and patient age. Approximately half of all VSDs are small[11] and up to

75% of those will close spontaneously[12]. Five percent to 10% of moderate or even large VSDs may also undergo some degree of spontaneous closure[13]. Trabecular muscular septal defects may close more frequently than perimembranous defects, while closure of outlet defects is least common[14]. The highest closure rates are observed in the first year of life. Ninety per cent of VSD destined to close will have done so by age 10 years, while spontaneous closure in adult life is unusual but reported[11].

In the same period under review we had 2 patients who were suspected to have patent ductus arteriosus (PDA) clinically. This was not however confirmed by echocardiography due to the lack of appropriate probe required for its detection especially in the very young. This makes PDA glaringly absent among the subjects.

Among the cyanotic heart defects, Tetralogy of Fallout was the commonest. This is also in agreement to findings done elsewhere [6,8-10]. It accounted for 17.1% of all structural heart diseases in this series. This is highly distressing considering the non availability of either palliative or definitive procedures in this country. The only case of Pentalogy of Fallot (TOF plus ASD) seen was referred to the echo laboratory from a peripheral hospital for evaluation and was never seen in our paediatric cardiac clinic.

Rheumatic heart disease is the commonest acquired heart lesion seen in this study, confirming it as the most commonly seen acquired heart disease in the tropics[15,16]. Ninety-two point three (92.3 %) of the subjects have mitral valve incompetence either in isolation or in combination with other lesion. This finding is similar to the 95% described by Jaiyesimi and Antia in Ibadan[16] while Bode-Thomas *et al* working in Jos reported mitral valve incompetence (either in isolation or in combination with other lesion) in all the 15 cases of rheumatic heart diseases seen[17]. Aortic, pulmonary and tricuspid valvular lesions are rarely seen in rheumatic heart diseases[16,17].

The high incidence of rheumatic heart diseases is a reflection of the poor living conditions and inadequate health care services since it is an established fact that rheumatic heart disease, a sequelae of acute rheumatic fever, can be controlled by prompt and adequate treatment of sore throat and improvement of living condition[18].

The 7 (8%) cases of dilated cardiomyopathies (DCM) seen in older children probably resulted from previous myocarditis, most likely viral that went unnoticed or misdiagnosed. They could also be familial/genetic forms of DCM. It is a structural heart disease as it is characterized by ventricular remodeling producing chamber dilation, with normal or decreased wall thickness, and diminution in systolic function[19].

With establishment of tertiary healthcare institutions in Nigeria, availability of echocardiographic facilities as well as increasing number of Paediatricians interested in heart diseases in children, more of these cases are likely to be seen in the future. At the moment doctors live with the agony and pain of providing only conservative management to these patients because of lack of cardiothoracic surgical centres in the country and inability of the patients to afford to go abroad for care. In this respect, we wish to commend the efforts of some of our senior colleagues who are able to collaborate with some centers abroad to have these patients treated almost at no cost. We also like to give credit to the Kanu Nwankwo Heart Foundation, a charitable organization which has been in the fore front, sponsoring the treatment of Nigerians and non Nigerians alike who suffer from heart diseases requiring surgical intervention. There is an urgent need for the government to support these efforts as well as establish a well-equipped cardiothoracic surgical centre to cater for these patients either free or at a highly subsidized rate.

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