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Pattern and Clinical Profile of Cardiac Anomalies among Adolescents in a Tertiary Health Facility in Enugu, South East Nigeria

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Abstract

Objectives: The objective of this study was to determine the pattern and clinical manifestations of structural cardiac diseases among adolescents attending UNTH, Enugu, Nigeria.

Methods: A retrospective analysis with structural cardiac cases with symptoms presumed to be of cardiac origin or on referral seen among adolescents attending both the children outpatient clinic and cardiology clinic.

Results: The prevalence rates of cardiac diseases among these adolescents was 0.35% (58/167); 0.20% (34/167) for congenital and 0.14% (24/167) for acquired heart diseases. The commonest structural heart disease observed in these adolescents was Tetralogy of Fallot (TOF), diagnosed in 22.4% (13/58) of them, followed by Rheumatic Heart Disease (RHD), and observed in 17.2% (10/58). Among those with congenital heart disease, surgery was performed in 31.8% (11/34) of the subjects. However, following surgery, 78.6% (11/14) still has residual heart defect.

Conclusion: The results of this study show that 0.35% (58/167) per cent of adolescents who presented with clinical manifestations or were on referral and seen in UNTH had structural cardiac abnormalities with over half having residual lesion after surgery.

Keywords: Pattern; Heart diseases; Adolescents; Enugu

Introduction

Congenital Structural Heart Disease (CHD) is the commonest form of congenital anomalies in children, with a reported incidence of 7.1 per 1000 births [1]. Following advances in the field of paediatric cardiology, cardiac surgery, and critical care, most children born with CHD survive to adolescents [2,3]. One of the major issues among adolescents with congenital heart disease is the transition from paediatric to adult care, which should be optimized and well-structured to avoid interruption of care [4]. It is important to note that adolescents with congenital heart disease have different features and psychological attributes than children [5]. In fact, in developed countries, specialized centres have been developed to care for adolescents with congenital heart diseases. Currently there is paucity of data on the spectrum of structural heart disease in adolescents in Nigeria. In the absence of proper care, adolescents and adults with congenital heart disease could face serious mental and physical health consequences [6]. Less than 30% of adults with congenital heart disease have health care providers who are trained in this specialty.

Acquired Heart Diseases (AHDs) are a complex group of disease entities affecting the heart and great vessels of children [7]. This is responsible for a reasonable morbidity and mortality in children especially adolescents [8,9]. The prevalence of the acquired heart diseases in children varies from region to region. In Nigeria, the rates are between 28.1% and 68%. However the actual prevalent rates among adolescents is not well known especially in this environment.

This study was therefore aimed at determining the pattern and clinical manifestations of structural cardiac diseases among adolescents attending UNTH, Enugu, Nigeria.

Materials and Methods

This study was a retrospective study in which adolescents with cardiac diseases seen between June 2012 and June 2018 were consecutively recruited. The hospital receives referral within the state and from other states in south east Nigeria, but receives referred cardiac cases from all over the country. All the adolescents had a detailed history taking with physical examination done [10]. Subsequently chest radiograph, electrocardiography, and echocardiography were conducted. Transthoracic echocardiography was performed on all the subjects using a GE Vivid Q echocardiography machine. This machine had the facility for 2D, M-mode, and color-flow Doppler imaging.

The echocardiographic diagnoses of the various congenital heart diseases and acquired heart diseases were based on the standard diagnostic criteria [11]. All children with echocardiographic diagnoses of both congenital heart diseases and acquired heart diseases whose parents granted informed consent were included in the study, and all children without congenital heart diseases and acquired heart diseases were excluded.

A structured questionnaire was used to obtain information from the case files of patients. Data were analysed using Epi Info and SPSS, version 20. Frequency and tables were used for categorical data [12].

Mean and standard deviation were used to summarize the details of the data that were normally distributed.

Results

Between June 2012 and June 2018, a total of 14,849 adolescents were seen.

167 of these presented with symptoms and/or signs attributable to the cardiovascular system. Their age ranged between 10 and 20 years with a mean age of 15(3) years. The mean age at presentation to hospital was 11.2(3.8) years. Of these 34 had 2D Echo confirmed structural heart defects while 24 had acquired heart disease? The prevalence rates of cardiac diseases among these adolescents was 0.35% (58/167); 0.20% (34/167) for congenital and 0.14% (24/167) for acquired heart diseases. The mean age at presentation to hospital was 11.2(3.8) years. As shown in Table 1, most patients belong to the middle and low socio-economic class. Social classes 1 and 5 are least represented. The commonest heart disease observed in these adolescents was Tetralogy of Fallot (TOF), diagnosed in 22.4% (13/58) of them, followed by Rheumatic Heart Disease (RHD), and observed in 17.2% (10/58). Other cardiac defects such as single ventricle, truncus arteriosus, dilated cardiomyopathy, double outlet right ventricle, complete atrio-ventricular canal defect constituted 22.4% (13/58) of the cases. Table 2 shows the different cardiac defects (both congenital and acquired) and their frequency. The frequency of various symptoms is presented. The commonest symptom was easy fatigability, observed in 50% (29/58) of the patients. The second and third commonest were fast breathing and cough respectively while cyanosis was the least observed sign. Among those with congenital heart disease, surgery was performed in 31.8% of the subjects. However, following surgery, 78.6% (11/14) still has residual heart defect (Table 1).

Disease	n	%
TOF	13	22.4
RHD	10	17.3
ASD	6	10.3
VSD	3	5.2
Hypertension	5	8.6
Cardiomyopathy: Dilated	6	10.3
Hypertrophic	2	3.5
Others	13	22.4
Total	58	100

Abbreviations: TOF: Tetralogy of Fallot; RHD: Rheumatic Heart Disease; ASD: Atrial Septal Defect; VSD: Ventricular Septal Defect; TA: Tricuspid Atresia; TA: Transposition of reat Artery; PDA: Patent Ductus Arteriosus; AVCD: Atrio-Ventriclo septal Defect; MR: Congenital Mitral Regurgitation, awasaki Disease.

Table 1: Common cardiac disease in the subjects.

Symtom	n	%
Cough	17	29.3
Easy fatigability	29	50
Fast breathing	17	29.3
Breathlessness	12	20.7
Squatting	4	6.9
Abdominal distention	4	6.9
Chest pain	13	22.4
Fainting attack	3	5.2
Cyanosis	1	1.7

Table 2: Percentage frequency of various symptoms in adolescents with congenital heart disease.

Discussion

From our study, we noted varying prevalence rates among adolescents with cardiac and both congenital and acquired heart disease to be 0.35% for cardiac disease; 0.20% for congenital and 0.14% for acquired heart diseases. The prevalence of congenital heart disease among adolescents surprisingly was the same figure obtained

in a study among children which was 0.22%. Though this was far lower when compared with world prevalence rate of children with congenital heart diseases which is 7.1 per 1000 births. Several reasons could portray the similar prevalence of congenital heart disease in children and adolescents obtained in our study. Open heart surgery is not routinely accessible to children in the study locality. Hence most of the children with congenital heart disease tend to grow to adulthood with some complications and several hospital admissions. Again there is no laid down program of transitioning among these children when they get to adolescents age. One of the first challenges in adults is the transition from paediatric to adult care, which should be optimized and well-structured to avoid interruption of care. Regrettably, the mean age at presentation for the adolescents with congenital heart disease and at final diagnosis was 11.4 years. Though it ranges from 1 year to 17 years. This shows the fact that health education and serious campaign on congenital heart disease in the rural areas and community is very paramount to enhance early diagnosis and intervention to avert the numerous complications that follow this anomaly. The mean age of the adolescents with congenital heart disease in this study was 15(3) years. This is far lower than that obtained in an Oman study where a mean age of 24 years was obtained and that reported in Europe where the median age is 27 years, and 29 years in North America. The low mean age obtained in our study when compared to others simply showed that those with high mean age probably survived to that point because of timely and routine surgical intervention which is lacking in our setting. This study showed a male preponderance among the adolescents with congenital heart disease. This is worrisome because it varied with the normal female preponderance among both children and adolescents with congenital heart disease. However the study showed a male: female ambivalence. We could not explain this male predominance obtained in our study but geographical variations, sample size issues and cultural correlates may be implicated.

It is necessary to point out here that the commonest structural heart disease among adolescents in this study is Teratology of Fallot. This again is in abeyance with that obtained in studies where Ventricular-septal defect is noted to be the commonest congenital heart disease especially in children.

We noted with interest in this study, that of 143 adolescents with clinical murmurs and/or other features of congenital cardiac anomalies, only 34 had confirmed cardiac lesions by means of echocardiography with error of 24%. Some cardiac lesions may not show clinical murmurs such us transposition of great artery with intact septum, some single ventricle physiology etc. This may explain this clinical features echo mismatch. Chinawa 15 et al. in his study noted that more than a third of clinical diagnosis of cardiac disease did not conform to echocardiography findings. Though echocardiography is well accepted for evaluation of cardiac function. The efficacy of echocardiographic findings in confirming congenital cardiac disease is not to be entirely depended on. This has been proven in some studies.

Among the few reasons for which clinical diagnosis may not be in tandem with echocardiographic results, is some cardiac anomalies like cotriatum sinistrum which may be mistaken for a Ventricular septal defect because of the typical pan-systolic murmur seen in this anomaly which also presents exactly like ventricular septal defect clinically.

We obtained a prevalence of 0.16% among adolescents with acquired heart disease in our study. This is different from that obtained in other centres in Nigeria where prevalence rates are higher, with Rheumatic heart disease ranking the highest. The very low prevalence rate seen in adolescents compared to that in children with acquired heart disease could be due to the fact that many of our subjects were lost to follow up.

When we looked at the surgical clinical profile of adolescents with congenital heart disease, we noted that the commonest symptom was easy fatigability. Among those with congenital heart disease, surgery was performed in less than a third and over half still have a residual lesion

A study by Carole et al. stated that majority of his patients who had cardiac surgery always consider themselves as cured. In reality, it is important to note that there is almost no complete surgical cure for congenital heart disease, probably only perhaps with the exception of a successfully ligated and divided ductus arteriosus. All other repaired lesions have the potential for residual lesion and sequelae. The misperception of “cure” poses worrisome consequences. For instance, adolescents who had cardiac surgery and who believe in total cure may forget to use antibiotic prophylaxis or even anti- failure regimen and may not even continue to follow up on medical advice. Consequently, this residual lesions and sequelae which is frequently overlooked may evolve with attendant symptoms.

Conclusion

Adolescents present with various forms of structural cardiac diseases, with teratology of Fallot and Rheumatic heart disease presenting as the commonest congenital and acquired variety respectively. Residual lesions among adolescents with congenital heart disease who had surgery can occur and surgery does not necessarily mean total cure.

Limitation

This study will be worthwhile if taken in a larger community.

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We bear all the costs accrued from this study. We have no sponsor.

Conflicts of Interest

There are no conflicts of interest.

References

1. Kolo PM, Adeoye PO, Omotoso AB, Afolabi JK (2012) Pattern of congenital heart disease in Ilorin. Niger Postgrad Med J 19: 230-234.
2. Van Der Bom T, Zomer AC, Zwinderman AH, Meijboom FJ, Bouma BJ, et al. (2011) The changing epidemiology of congenital heart disease. Nat Rev Cardiol 8: 50-60.
3. Subramanyan R, Joy J, Venugopalan P, Sapru A (2000) Incidence and spectrum of congenital heart disease in Oman. Ann Trop Paediatr 20: 337-341.
4. Zomer AC, Vaartjes I, Grobbee DE, Mulder BJ. (2013) Adult congenital heart disease: new challenges. Int J Cardiol 163: 105-107.
5. Jalkut MK, Allen PJ. (2009) Transition from pediatric to adult health care for adolescents with congenital heart disease: A review of the literature and clinical implications. Pediatric Nursing 35: 381-387.
6. Sable C, Foster E, Uzark K, Bjornsen K. (2011) Best practices in managing transition to adulthood for adolescents with congenital heart disease: The transition process and medical and psychosocial issues: A

scientific statement from the American Heart Association. Circulation 123: 1454-1485.

7. Sliwa K, Mocumbi AO (2010) Forgotten cardiovascular diseases in Africa. Clin Res Cardiol 99: 65–74.
8. Mocumbi AO, Ferreira MB. (2010) Neglected cardiovascular diseases in Africa: challenges and opportunities. J Am Coll Cardiol 55: 680–687.
9. Asim AB, Hamood AK, Hamood AS, Suresh Kumar, Salim AM, et al. (2015) Adolescents and Adults with Congenital Heart Diseases in Oman. Oman Med J 30: 26–30.
10. Chinawa JM, Obidike E, Eze JC, Ujunwa FA, Adiele D. (2013) Does 2D Echocardiography Tally with Clinical Diagnosis In The Management Of Congenital Heart Disease?. Am J Cardiol 11: 1.
11. Nabel EG, Braunwald E. (2012) A tale of coronary artery disease and myocardial infarction. N Engl J Med 366: 54–63.
12. Nkoke C, Menanga A, Boombhi J, Chelo D, Kingue S. (2015) A new look at acquired heart diseases in a contemporary sub-Saharan African pediatric population: The case of Yaoundé, Cameroon. Cardiovasc Diagn Ther 5: 428–434.