

**The Burden of Heart Diseases in Children:  
Any Hope for the Nigerian Child?**

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**39th Inaugural Lecture  
Olabisi Onabanjo University  
Ago-Iwoye**

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## **The Burden of Heart Diseases in Children: Any Hope for the Nigerian Child?**

*The Vice-Chancellor,  
Principal Officers of the University,  
Provosts of Colleges and the Postgraduate School,  
Deans of Faculties,  
Colleagues, Friends from sister Universities and Institutions,  
Our Royal Fathers,  
Pastors and other Ministers of the Gospel,  
Gentlemen and Ladies of the Press,  
Distinguished Ladies and Gentlemen,  
Great OOUITES.*

### **Preamble**

It gives me immense pleasure to be invited to deliver the 39th Inaugural Lecture of the Olabisi Onabanjo University, Ago-Iwoye. This being the fourth from Paediatrics Department, the sixth from the Faculty of Clinical Sciences and the eighth from the Obafemi Awolowo College of Health Sciences. This lecture: 'The Burden of Heart Diseases in Children: Any Hope for the Nigerian Child?' gives me the opportunity to give an account of my research efforts in paediatrics, with a special bias to cardiology (a sub-specialty dealing with diseases of the heart) over the last twenty-one years.

A heart disease is any disorder of the heart resulting in abnormal functioning of the organ. The disease could either be present at birth (though detection could sometimes be much later on in life), i.e., congenital or a type that develops later in a normal heart after birth, i.e., Acquired.

According to the *Holy Scriptures* (The Bible), the heart is the most important part of the human make-up. It says: 'guard your heart with all diligence, for out of it are the issues of life' *Proverbs 4: 23*. William Harvey (1578-1657) said:

*"For it is the heart by whose virtue and pulse, the blood is moved, perfected, made apt to nourish and is preserved from corruption and coagulation... It is indeed the fountain of life, the source of all action".*

Hence the heart, whether spiritual or physical is a very vital unit in the human. The physical heart is responsible for pumping adequate blood to meet the metabolic needs of the body. Any affection of this organ therefore, may have untoward effect on the totality of man's life and existence.

Children are generally regarded as individuals below a specified age. In Nigeria, the cut-off mark is fifteen (15) years while it is eighteen (18) years in Britain. 'Children are not like men or women, they are almost as different creatures in many respects, as if they never were to be one or the other; they are as unlike as buds are unlike flowers, and almost as blossoms are unlike fruits' (Walter Savage Landor, 1775-1864).

Who first described a heart defect? Rashkind (1982) in his book, using a scholarly and humanistic approach, alluded to the fact that the importance of the heart and its normal position in left the thorax was known to both hunters and artists some twenty thousand (20,000) years ago in Northern Spain. He also reproduced a Babylonian tablet dating at least 2000 (B.C.) with the inscription 'When a woman gives birth to an infant that has the heart open and has no skin, the country will suffer from calamities.' He proposed this as the first description of *ectopia cordis*. Rashkind however credited Galen with a clear description of the oval foramen and arterial duct and their normal closure after birth and Leonards da Vinci with the first description drawing of an *atrial septal* defect.

Originally, paediatric cardiology started as a purely academic discipline (Williams and Key, 1941; Gorny, 1985; Gallahan and Kelly 1987), but has recently advanced to the present age of intervention.

### **Pattern of Heart Diseases in Childhood**

In Nigeria and most parts of the developing world, *Congenital Heart Diseases (CHDS)* account for 80-90% of patients attending most cardiology clinics, while the acquired variety is responsible for the remaining 10-20%. According to a most recent report from *Lagos University Teaching Hospital (LUTH)*, Lagos (Okoromah *et al.* - In print) under-fives, excluding newborn accounted for 84.7% of *CHD*, while children older than 5 years accounted for 73.8% of *Acquired Heart Diseases (AHDs)*. Hence the younger a child is, the greater the chances of *CHDs* being responsible for his cardiac disorder. In Nigeria, the incidence of *CHDs* in the newborn was found to be 3.5 per thousand live births. With sufficient follow-up however, it rises to 6-8 per thousand live births. According to *UNICEF, State of the World Children 2003*, the crude birth rate in Nigeria is 39 per thousand. Assuming population of 120 millions, this means that about 4.6 million babies are born annually in Nigeria. With an average incidence of *CHD* of 7 per thousand, it means that about 32,200 babies are born annually with *CHD*. What an alarming statistics. Quite a significant number of these babies with *CHDs* did not get to our hospitals; many are born stillbirth or die soon after delivery. Hence the above figures may actually be a tip of the ice-berg.

*Ventricular Septal Defect (VSD)*: commonly referred to as 'hole in the heart' by the layman, accounts for 30-50% of all *CHDs* in most series (Bondi and Jayesinni, 1992; Antia, 1967; Olowu, 1999; Okoromah *et al* 2006). The other fairly common *CHDs* include: *Atrial Septal Defect (ASD)*, *Persistent Ductus Arteriosus (PDA)*; *Tetralogy of Fallot (TOF)*; *Aortic Stenosis (AS)*; *Pulmonary Stenosis (PS)*; *Coarctation of the Aorta (COA)*, and *Transposition of the Great Arteries (TGA)*. These together with *VSD* constitute 85% of all *CHDs* in this part of the world.

**Table 3: %Distribution of types of CHD in Live-Born Infants**

Lesion	Western World	Nigeria	Africa
VSD	24-35	39	19-36
PDA	6-13	21	16-27
ASD	4-11	12	6-17
AVSD	3-7	9	3-5
PS	2-13	6	6-9
COA	3-10	0.9	0.9-6.1
TGA	3-8	1.5	1.8-4.5
TOF	4-9	3	2-21
CAT	1-3	-	0.7-2.6
HLH	0.8-3.0	1.5	2.3
HRH	0.6-3.4	4.5	4-7
DIV	0-2	-	1.7-2.3
DORV	0.6-1.0	-	0.9
TAPVC	08-2	1.5	0.5
MISC	3-22	10	8-11

Source: Omokhodion S. I. WACP Update course Lecture 2005

The pointers to the presence of CHD in a child as reported by Olowu A. O. (1993) are shown in Table 4. Special note should be made of Odd facies, Recurrent Respiratory Tract Infection (especially Pneumonia) and Recurrent Heart Failure.

The Acquired Heart Diseases (AHDs) commonly seen in children in Nigeria and many other parts of the world include: *Acute Rheumatic Fever (ARF)*, *Rheumatic Heart Diseases*, *Cardiomyopathies*, *Infective Endocarditis*, *Mycocarditis* and *Pericarditis*. *Acute Rheumatic Fever* accounts for about 75% of these acquired Cardiopathies. It derives its name from the joint manifestation of the disease but owes its importance to the rapidity with which *Cardiac Sequelae* ensues. It is most commonly seen in the three (3) to fifteen (15) year age -group, with throat infection (*pharyngitis*) occurring one (1) to four (4) weeks before the onset of systemic manifestations.

*Cardiomyopathies* remain a heart muscle disease of unknown origin. They constitute 10 to 20% of the AHDs. Measles is a serious infective disease in the African child (Morley D, 1963; Olowu A. O., 1990) and could be complicated by heart disease, especially Myocarditis (Blattner RJ, 1994) and Jaquesinmi F, 1976). The latter could occur both clinically and sub-clinically. In a prospective study of one hundred (100) children with measles, Olowu and Taiwo (1990) found 35% with *Electrocardiography (ECG)* evidence of *Myocarditis* in the acute phase, while eighteen (18) of the fifty (50) children had repeat *ECG* done at three (3) months had at least one *ECG* change of *Myocarditis*. It was pointed out that in fourteen (14) out of these eighteen (18), the *ECG* changes were due to persistence of the earlier noted changes in the acute phase. The extent to which measles as an endemic infective disease in the tropics contributes to the *Aetio-pathogenesis* of *Cardiomyopathies* remains unknown. Longer-term follow-up of patients with measles will be necessary.

A common final pathway for both CHDs and AHDs is **Heart Failure (HF)**. It is defined as the inability of the heart to pump enough blood to meet the metabolic requirements of the body despite adequate venous return to the heart (Martin H.L., 1969). Infants and young children under five years are more predisposed to this condition than the older children (Jaquesinmi F, 1977; Olowu, 1992). The prevalence rate of HF among

children in Nigeria varies between 3% and 7.02%. Adekanmbi and Olowu, (2005) obtained the latter figure in a more recent study. HF is a medical emergency that must be anticipated in every acutely-ill child (Olowu, 1989). The common causes of HF in childhood are *Pneumonia*, severe *Anaemia* and *Septicaemia*. Tables 5 to 6 show the aetiological factors in HF from some centers in Nigeria. In a prospective study of one hundred and fifty four (154) cases of *Pneumonia* in infancy and childhood in Sagamu, Olowu and Njokanna, (1993) documented HF as the commonest complication in 31.2%. The emphasis here is the fact that most of the common causes of HF in the developing world, unlike in the developed, are largely preventable.

The clinical photographs of two of my patients as shown through the projector : The first is a three (3) year-old female with VSD (please note the growth failure), while the second is that of a seven (7) year-old female with *Rheumatic Heart Disease (Mitral Incompetence-MI)*.

### The Required Diagnostic Tools

The useful tools in the diagnosis of heart disease can be broadly divided into two:

1. Non-invasive
  - i. *Chest Radiography (X-Ray)* will show:
    - a. the shape of the heart;
    - b. the size of the heart;
    - c. vascularity of the lungs, and
    - d. underlying pathologies, e.g. Pneumonia
  - ii. *Electrocardiography (ECG)*: Though not too specific, it could however be very useful in the context of a known cardiac case, e.g. *Arrhythmias, Pericardial Effusion*.
  - iii. *Echocardiography*: The types available are: Mmode, 2Dimensional, Doppler and Contrast Echo. It is very useful in

cardiac diagnosis and is currently being employed in interventional therapy.

2. Invasive
  - i. Cardiac Catheterization;
  - ii. Angio-cardiography; and
  - iii. Magnetic Resonance Imaging

Details of above invasive methods are beyond the scope of this lecture

**Table 4: Pointers to the Presence of CHD in a Child**

◆ Odd Facies
◆ Growth Failure
◆ Feeding difficulties with Prolonged Feeding time
◆ Exercise Intolerance
◆ Persistent Central Cyanosis Worsened by Crying
◆ Recurrent RTI
◆ Recurrent Episodes of CCF
◆ Squatting to relieve Paroxysmal Hyperpnoea
◆ Precordial Bulge
◆ Presence of Extra-Cardiac Congenital Malformations

Source: Olowu A. O. PGD 1993

**Table 5: Causes of Heart Failure in 137 Patients**

Cause	No. of Patients	% of Total
<i>Pneumonia</i>	59	43.1
<i>Anaemia</i>	55	40.1
<i>Septicemia</i>	29	21.2

**Table 5 Contd.**

Bronchiolitis	7	5.1
CHD	7	5.1
Septic Pericarditis	3	2.2
Meningitis	2	1.5
Croup	2	1.5
Others*	3	2.2

\* One each with ARF, Birth Asphyxia and Infective Endocarditis.

*Oluwu A. O. NIP 2003*

**Table 6: Aetiology of Heart Failure in the Different Age-groups**

Diagnosis	No. of patients				Total	% of Total
	Neonate	1-12 Mon	1-5yrs	>5yrs		
ARI	0	26	10	0	36	
Severe Anaemia	1	8	14	5	28	
CHD	1	0	4	1	26	
RHD	0	0	0	6	6	
Renal Disorders	0	0	0	3	3	
Septicemia	0	0	0	1	1	
Total	2	54	28	16	100	

*Source: Lagunju I. A. and Onokhodion S. A., (2003); WJMM 2003 22 (1)*

## Treatment

The treatment options available to our cardiac patients include:

### 1. Medical

Common complications of heart diseases, *e.g.*, Heart Failure, *Pneumonia*, and *Polycythaemia* must be treated medically if present.

### 2. Surgical

The surgical options available in cardiac diseases could be palliative (*i.e.*, to provide temporary relief) or definitive with attempt at correction of the primary abnormality.

The cost of each of the surgical options, especially for correction of *VSD*, run into several thousands or millions of Naira, which majorities of our patients can ill-afford. Out of the one hundred (100) patients with *CHDs* that we have managed at *Olabisi Onabayo University Teaching Hospital (OOUTH)* that needed surgical intervention, only two had so far benefited: one had financial support from the church (Catholic) for surgery done at Ivory Coast, while the other had partner that were financially buoyant for heart surgery in Britain. There are particular patients we managed since age five (5) years with *TOFV* could not afford the cost of Echocardiography not to mention that surgical intervention. She is now twenty four (24) years old, a candidate ready for marriage with the increased risk of same *CHD* in her siblings.

## Identified Problems

### 1. Poverty and Ignorance

The current monthly salary of the average Nigerian is quoted to be less than Ten (10) dollars per month. Hence many of our people prefer alternative treatment with the herbalists (traditional healers) or friends their arms and watch their loved ones die without adequate medical

treatment. Presently about 55% of Nigerians are illiterate (*UNICEF State of the World Children 2005*). They can hardly recognise the symptoms and signs of heart disease, but rather prefer to ascribe them to the handy-work of enemies via evil spirits.

## 2. Lack of Essential Equipments

Most Teaching Hospitals in Nigeria are poorly equipped to deal with cases of heart diseases in children. The existing equipments are obsolete and totally irrelevant in many cases. Presently, the Federal Government and most State Governments are spending far less than 6% of its annual budget on health. This is in contrast to the recommendation by the *World Health Organisation*. The present effort of the Federal Government of Nigeria towards upgrading the existing facilities in some Federal Teaching Hospitals is noted. We hope there will be sincerity and transparency in the award of the contracts and delivery of the equipments, with end-users being allowed to vet the adequacy or otherwise before payments are made. We only hope the Ogun State Government will follow suit with urgent purchase and upgrading of equipments for cardiac diagnosis in *OOUTH*. Presently there is no *Echo* machine in *OOUTH*. The E chocardiography done on our patients were carried out in nearby Teaching Hospital or at a private clinic in Sagamu. Last year, we missed a life-chance of having some Cardiac Surgeries done on some of our patients because the necessary back-up infrastructures and equipment could not be put in place before the visit by the missionary team from the United States of America, despite assurances from the State Government. We need at least four centers of excellence designated for cardiac surgery in Nigeria to ease the pain and emotional turbulence of our patients with cardiac diseases.

## 3. Poor Funding

*Non-Governmental Organisations* committed to offering cardiac surgery are poorly funded. There are quite a few *NGOs* in the country

presently that have the vision of bringing succour to some of children with cardiac diseases. They include: *Nigerian Heart Foundation (NHF)*; *Kanu Heart Foundation (KHF)*, and *Saw Child's Heart (SACH)*. While there is strong commitment on the part of these *NGOs*, lack of funds is a major handicap in their way. Only a very few of our numerous children with cardiac diseases have benefited from these *NGOs*.

## 4. Death of Paediatric Cardiologist

As of today, there are far too few Paediatric Cardiologists in the country. Many Paediatricians in training opt for other sub-specialties during post-graduate training because of the wrong notion that it is too rigorous and unrewarding. We want to use this forum to encourage many and coming doctors to please hearken to the clarion call for Paediatric Cardiologists. Additionally, we want to suggest to the present government in Nigeria to give necessary incentives to such doctors who were done in the past for disadvantaged sub-specialties.

## 5. Lack of Public Awareness

Presently, there is a move to designate February 7th to 14th each year as the *Congenital Heart Disease Awareness Week in the USA*. Why the *Bill* is still in the lower House, annual celebration of this *CA Awareness Week* has been held in the USA for the last five (5) years. To date, no center in Nigeria is committed to this celebration. Here, most of our populace remain ignorant of this lethal condition. I hereby wish to encourage Paediatric Cardiologists in our Nation to join their colleagues from USA and other parts of the world in this awareness generating celebration.



## Conclusion

My Vice-Chancellor Sir, I wish to submit that heart diseases are very important in childhood since they contribute significantly to morbidity and mortality. Presently a significant percentage of these afflicted children have no hope of getting surgical correction of their cardiac ailment because of the huge cost of overseas treatment which majority of our patients cannot afford.

The government must play a more pro-active role in addressing the gaps in our health-care delivery system. We hope the rich few in the society will come to the fore in providing the necessary financial support to the NGOs that are committed to providing succor to our cardiac patients.

## Acknowledgements

I give all glory and thanks to God Almighty who kept me by His power since my childhood, saved me, saw me through the rigorous undergraduate and postgraduate trainings to attain this pinnacle of my career. I also appreciate His grace over my life to serve in His vineyard.

My parents, Pa James Adebayo Olowu and Late Ma Comfort Olufunmilayo Olowu are well appreciated for bringing me forth into this world, nurturing, training and motivating me in life. A letter from my father to late Chief Ojo, the then Principal of Government College, Ibadan in the second term of lower six in 1972 was all it took to convert a would-be engineer to biology class and medical doctor.

I want to acknowledge specially the presence of my brothers, sisters, uncles, nephew, nieces and in-laws who created the time to honour me with their presence at this occasion.

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I were and are always a challenge to me. Some of your questions in clinics and ward rounds have kept me on my toes. The transformation in you with every set, over one or two years is quite remarkable encouraging. Keep the flag flying wherever you may be. The good I will open a way for you in life.

The distinguished presence of guests who have come from far near to grace this occasion is hereby recognised.

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The parents of some of my patients who are here in attendance are hereby recognised. Do not lose hope on your wards. The gracious God will perfect His work of Healing in their bodies in Jesus name.

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Mr. Vice-Chancellor Sir, Principal Officers of the University, Provost, Deans, Distinguished Guests, Friends, Relations, Ladies and Gentlemen, I thank you all for your rapt attention while I delivered my inaugural lecture. I pray God Almighty to bless you all and grant you journey mercies to your respective destinations (Amen).

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