

REVIEW ARTICLE

Cardiac services in Sudan: how pediatric cardiology started.

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Introduction

Unlike many other medical specialties, provision of cardiac services has always been heavy in human and financial cost. Over the past decades the cost of curative and reparative cardiac interventions, particularly those done for children, sky-rocketed while at the same time they became more heavily technology dependent. On the other hand prevention of cardio-vascular disease (CVD), while very rewarding and cost-effective, particularly when applied during childhood, is demanding and requires well-functioning health systems with soundly-built infra-structure which are beyond the reach of many developing countries. Sudan,

with a low per capita expenditure on health, is currently trapped in the difficult position of dealing with CVD of affluence while rheumatic heart disease (RHD) is still highly prevalent- Sudan has one of the highest prevalence rates for RHD worldwide (1,2). An appreciable load of congenital heart disease (CHD) mainly in children but also increasingly in adults, only makes the situation worse. This article reviews how pediatric cardiology services were first established in Sudan in the seventies and eighties of the last century blending a flashback at the history of these services with current and expected future developments. Although pediatric cardiac services in Sudan have generally been linked to those

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provided for adults, only relevant aspects of adult services will be covered in this article and the reader is referred to other publications covering that aspect (3,4,5).

Start of cardiology services and cardiac surgery

The year 1962 when the first cardiac unit for adults was established at Alshaab Teaching Hospital in Khartoum, represents an important landmark in the history of cardiac services provision in Sudan. However, cardiac surgery started earlier during the late fifties and early sixties. The ever ubiquitous rheumatic heart disease was a significant burden then as it is today. Expectedly, mitral valvotomies for rheumatic mitral stenosis and aortic valve dilation for aortic stenosis were the dominant cardiac operations performed.

In pediatric cardiology it has always been the surgeon, not the pediatric cardiologist, who shaped the landscape and made

Elseed, pediatric cardiology the difference between life and death. Two of the pioneering surgeons who get the credit for laying the foundations for cardiac surgery in Sudan are Mr. John Jacques, FRCS (Edin) and Mr. Ahmed Abdelaziz Yagoub. The name of Mr. Jacques should be engraved in the memory of

every Sudanese cardiologist not only because of his pioneering work to establish open heart surgery in Sudan, but also because of his sudden and tragic death in England in 1962, just months after he returned from Sudan. He was only 36 years old. I quote the obituary of Professor H. Butler, then the dean faculty of Medicine, University of Khartoum:” John joined the faculty as a lecturer in surgery in July, 1959 and promptly became responsible for all the cardiac surgery in Khartoum Civil Hospital in addition to taking his full share in teaching and general emergency surgery. Very soon indeed, he was to perform the first open-heart surgery in the Sudan, a notable milestone in

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the march of surgery in this country.”(6) Mr Jacques, together with Dr Abdel Halim Mohamed, also get the credit of compiling one of the earliest surveys of RHD in Sudan(7).

The introduction of hypothermic circulatory arrest to perform open heart surgery for the first time in Sudan by Mr. Jacques should not go without notice either. It is heartening to remember that Khartoum Civil Hospital witnessed that great milestone in the year 1959 only few years after the technique was first introduced to the whole world by Dr F. John Lewis at the University of Minnesota in 1952 when a girl with an atrial septal defect became the first beneficiary from the novel technique (8).

If the credit of inaugurating cardiac surgery in Sudan goes to Mr. Jacques, the hard and demanding task of sustaining the program and maintaining its momentum goes to Mr. Ahmed Abdel Aziz Yacoub. Mr. Ahmed’s contribution to the

Elseed, pediatric cardiology development of almost every surgical subspecialty cannot be overstated but his pivotal role in developing cardiac surgery in particular deserves special mention. He used to think big and, having lived and felt the crushing burden of surgically correctable heart disease, he worked indefatigably to start open-heart surgery in Sudan and to augment the orphan surgical theatre in Khartoum Civil Hospital by another surgical complex. To Mr. Ahmed goes much of the credit of establishing the theatre complex at Alshaab Teaching Hospital. He also gets the credit for inaugurating and continuing the work in that complex and, against all odds, making available medical, surgical, technical and nursing staff.

Start of Pediatric Cardiology.

Before 1975 Pediatric cardiology as a separate specialty did not exist in Sudan. That year i.e. thirteen years after an adult cardiac service was established in Alshaab Teaching hospital, the author established

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the first dedicated pediatric cardiology outpatient clinic. The location was Fath Alrahman Albashir Health center. From the start flow of patients to the clinic from all parts of Sudan exceeded my expectations and in a few years large numbers of patients were enrolled including, interestingly enough, adolescents and few adults with CHD. Also for the first time teaching of undergraduates and training of postgraduates on pediatric cardiology was conducted in that clinic. Patients attending the clinic were also the focus of a number of scientific papers that were either presented at medical conferences or published (9-13). The lack of echocardiography service and inpatient beds dedicated for children with heart disease, however were real obstacles. In the mid-seventies of the last century it was difficult to convince authorities of the great importance of that imaging modality which was in its infancy. In 1979 however cardiac catheterization became available at Alshaab teaching

Elseed, pediatric cardiology hospital and I started doing cardiac catheters on children for the first time in Sudan.

Mr. Chris Lincoln's visit.

Hardly one year after I established the Pediatric cardiac outpatient clinic, I approached Mr. Ahmed first in 1976 and suggested establishing a subspecialty in pediatric cardiac surgery. I also suggested inviting Mr. Christopher Lincoln, a well-known congenital cardiology surgeon, from the Royal Brompton hospital in London, where I trained, to kick-start work in that branch of surgery. My suggestion found a receptive ear from Mr. Ahmed not only because he had a genuine desire to help children with heart disease, but also because he always felt that patients with CHD and relatively more healthy myocardium, were the best subjects on whom to start a program of cardio-pulmonary bypass surgery. Furthermore, this was the experience in Western countries when cardiopulmonary machines

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were first introduced in the early fifties.

Promptly in February 1977 Mr. Lincoln came to Khartoum and during his short stay he, together with Mr. Ahmed and his team, did experimental work on animals which Mr. Ahmed had already started. In his report, to the then minister of health, Mr. Lincoln was critical of some shortcomings that needed to be tackled before starting open-heart surgery. Mr. Lincoln's report no doubt helped to establish a clear vision on how to start and maintain the program. But the most productive outcome of Mr. Lincoln's visit was his contribution to staff training in UK. Mr. Ibrahim Mustafa, whom I knew as a fine surgeon with deep interest in congenital heart surgery and whom I recommended to Mr. Lincoln, as well as cardiac technicians and nurses who were accepted for training in some of the best centers in UK including the Royal Brompton, National Heart and Harefield hospitals.

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British-Sudanese link and inauguration of open heart surgery.

Mr. Lincoln's visit to Khartoum was the first in a series of visits by British surgeons that, together with the hard preparatory work by Mr. Ahmed, made cardiopulmonary bypass surgery possible. February 1980 and January 1981 witnessed two visits to Khartoum by the renowned British surgeon Mr. Donald Ross who, together with Mr. Ahmed and his team operated under cardiopulmonary bypass on patients with CHD and RHD thus fulfilling Mr. Ahmed's long-held desire. In February 1982 Sir Magdy Yagoub, another renowned British surgeon, also visited Sudan and operated on more patients with CHD and RHD. Mr. Ibrahim Mostafa who finished his training in England returned to Sudan in 1980. As expected, he was a great asset both for his country and for patients with CHD in particular. He wasted no time and started operating on his own shortly after he returned

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to Sudan. He was also part of the local team that operated with Mr. Donald Ross during his second visit to Khartoum in 1981 as well as with Sir Magdy Yagoub. History did indeed repeat itself in February 1980 when Mr. Donald Ross visited Khartoum to operate for the first time on patients with CHD. That visit is in many ways reminiscent of the historic visit by the renowned American surgeon Mr. Alfred Blalock to Guy's hospital in London in 1947 when he and Mr. Russel Brock (later on Lord Brock) jointly did the first Blalock-Taussig shunt operation in Europe on a child with tetralogy of Fallot. However for those of us who were lucky enough to be deeply involved in the pre and post-operative handling of the patients operated on during the three visits to Sudan by the British surgeons, it was gratifying to witness not only the transfer of technical know-how but also to feel the palpable spirit of team work that encompassed everyone. Indeed history not only repeated itself then, but history was

Elseed, pediatric cardiology actually being made when Sudanese patients, whose sacrifice and courage should never be forgotten, were jointly operated on for the first time in Sudan under cardiopulmonary bypass in an orchestrated performance by British-Sudanese surgeons. One felt really proud to be part of that moment.

Dr H. Raffa's visit.

The British-Sudanese cardiac link was, however short-lived and after 1982 there was no more exchange of visits or staff training in England. In 1984 though, Dr. Hassan Raffa, cardiac surgeon at King Fahad hospital in Jeddah, visited Khartoum to operate on patients with heart disease. He came in a private jet which he used to tour other cardiac centers in the region and was accompanied by his cardiac team. For those of us who witnessed the earlier visits by the British cardiac surgeons as well as Dr. Raffa's visit, comparing the former to the latter was inevitable. Transfer of technical know-how was no longer a novelty during Dr.

Raffa's visit after many of the cardiac operations had already been done by the British surgeons and were also being routinely done by Mr Ibrahim Mostafa after his return to Sudan. A relatively large number of patients were operated on by Mr Raffa but with a significantly higher mortality almost approaching 10%. This may partly be explained by the complex nature of some of the patients with CHD operated on. With hindsight, only simple CHD should have been ear-marked to undergo surgery. Furthermore, Information on the surgical capabilities of the visiting team to operate on complex CHD was not immediately available to us then. To many of us however, improving the learning curve of the visiting team members was not the only unknown aim of the visit. Recruiting the U.K-trained cardiac nurses and technicians was apparently an important aim as well. Shortly after the visit, the drain started and flow of nurses and technicians to Jeddah was in earnest. That,

Elseed, pediatric cardiology together with the later tragic death of Mr. Ibrahim Mostafa had a devastating effect on the short-lived open-heart surgery program. Children were the victims. In my view the unconditional acceptance of foreign surgical teams who still come to this country and operate on children with CHD should be revised.

Call for a brighter future.

More than four decades have elapsed since my first attempt to start a pediatric cardiology service in Sudan. It is sad to live and reflect on the status quo with almost total lack of comprehensive service especially life-saving cardiac surgery for children. Thousands of babies and children with CHD died unnecessarily in the past decades and thousands more will continue to die in the years to come unless a credible congenital cardiology surgery program becomes available. Unlike other common types of heart disease such as the ischemic, hypertensive and rheumatic entities, CHD is largely unpreventable. Even if efforts to control RHD in

children succeed, only a modest impact on current childhood cardiac morbidity and mortality is expected since CHD, the commonest of all birth defects, currently constitutes the major cardiac burden in Sudanese children. Furthermore, the ever-increasing load of adults with CHD and the heavy financial burden (amounting to millions of dollars annually) paid by needy families to do surgery for their children in an expanding market of international hospitals, strongly argue in favor of availing such a program locally. Agony due to CHD may consume the patient's whole life-span from birth to adulthood. In this respect, Sudan's population is listed amongst the poorest billion people worldwide in whom ischemic heart disease accounted for only 12% of the combined CVD and congenital heart anomaly disability-adjusted life years (DALYs) compared with 51% of DALYs in high-income countries (14). It is thus morally unjustifiable to continue denying our patients with CHD future surgical or

Elseed, pediatric cardiology interventional life-saving procedures.

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