

## **Developing paediatric cardiology in the developing countries**

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Over the last few decades, with the advent of prenatal diagnosis, improved prenatal care, single-stage early complete repair, and the advancement of interventional procedures, there has been a significant decrease in the number of children requiring surgical treatment for Congenital Heart Disease (CHD) in the developed world. This has also resulted in consolidation of surgical centres and programs in the western world resulting in an operative mortality of less than 3% for most conditions.

The developing world with poverty and lack of resources with its obligatory accompaniments of ignorance, superstition, high birth rate and insufficient trained manpower, there are conflicting health priorities. Their main battle is with infectious diseases and malnutrition; the biggest killers are diarrhoea, pneumonia and malaria: all being easily preventable or treatable. With about 30,000 children under 5 dying daily, and more than 10 million dying every year (about 6 million of which are preventable with simple health interventions), CHD is not an obvious priority here.

However, the incidence of CHD is the same as in the developed countries. Hundreds of thousands of children are born annually with treatable CHD, millions live untreated, and most die by the age of 20. There are considerable inequalities among rich and poor within each developing country with absolute decline in living standards and social conditions. This also means that a proportion of the population can afford treatment of even staged management of complex CHD.

This tragically exposes the conflict of the value of human life and its purchasability and one is forced to practice what is feasible than what is ideal. Alongside this if one puts the need for containing brain drain and the need for progress, every developing country must realise the need for setting up its own CHD service.

Many charitable organisations have, over the past few decades, attempted to address some of these issues by arranging various management options. The Rotary Gift of Life, Samaritan's Purse Children's Heart project, the Palestinian Children's Relief Fund

and Save a Child's Heart are some examples. The primary goal of these organisations is to provide transportation to an advanced medical centre, which would provide care free of charge or at a reduced cost (1). The draw back of this is selection of patients with prioritisation bias, and it takes away the opportunity for local empowerment and drainage of some potential national resources with creation of dependency.

An alternative approach is organising teams of physicians and support staff to visit various developing countries to deliver care, including surgery as well as to train local physicians and surgeons to enable them to independently perform diagnostic and therapeutic procedures (2). The Association of Children with heart disease in the World recently published their 10 years experience in treating congenital heart disease and training personnel in Cameroon, Syria and Egypt (3). However, there is a considerable increase in workload of the paediatric cardiologists/surgeons in the developed world who are already overwhelmed by the growing demands. Unless restraints and caution is observed, the trained work force could find themselves in the more developed world!

The effective management is to identify or create autonomous local structures giving support in terms of equipment finance and education. These centres should train people so that the care can be spread across the country. This should also be supplemented by satellite-guided telemedicine. The autonomous centre, funded both by government, private or charitable funds with clearly defined goals and provision of care, should work in close collaboration with a major centre in the developed world by which the experience can be shared. Cost-effective strategies should be employed so that a larger proportion of patients can benefit (4). Paediatric cardiology is still in its infancy in the developing world. The charitable organisations, medical centres and other organisations working in the field need to collaborate with each other and should have worldwide registry (5). These organisations should aim in identifying and creating autonomous centres and need a focused approach to avoid duplication of work.

The basic requirement of setting up such a centre will include:

1. A qualified paediatric cardiologist or paediatrician/cardiologist with an interest in paediatric cardiology willing to collaborate with the centre of excellence in the developed world.
2. Access to basic infrastructure including a catheter lab and echocardiography machine.
3. Capability to establish a clinic that can identify and focus on children with CHD
4. Capability to establish intra and post operative intensive care including pacing and set up for acquiring essential supportive medication.
5. Laboratory infrastructure including tests for human immunodeficiency virus, hepatitis, coagulation profile etc.
6. Provision for a database to monitor patients and their follow up.

In the initial stages of setting up an autonomous centre, interventional cardiologists may have a specific role to play. Definitive treatment of many CHDs can now be provided by trans catheter approach. As a part of training and setting up of peri operative intensive care, procedures like balloon valvuloplasty for aortic and pulmonary valve, and angioplasty for coarctation could be achieved at an early stage. Closure of defects like PDA, ASD, or VSD and maintenance ductal patency with stents could also be achieved depending on cost effectiveness appropriate for each centre comparable to surgery.

There is a clear difference in the approach and desirability of various treatment options between the two worlds. Any real achievement or progress in the field needs input into research and development appropriate for each country. Cost of interventions will continue to remain exorbitant, unless developing countries that are at an advantageous state at this point in time develop indigenous technology and interventional devices.

Preventive measures and education of population is still the mainstay of management of congenital heart disease in the developing world. Higher incidence of CHD and various other medical conditions including metabolic diseases continue to be a problem due to consanguinity. Death from diarrhoeal illness or infectious disease after an expensive and highly skilled procedure for CHD is still a reality in the developing world.

The developed world has inherited the misperception that CHD is a problem of the paediatric population

but have now reached a point in time when the majority of patients living with CHD are adults. The proportion of adults compared to children living with CHD will continue to increase into the future and provision for the care of adult congenital service (ACH) has to be part of any CHD set up in the developing world. Going by the established need in the west (6), along with the development of an autonomous centre, provision for training and staged planning for one CHD centre for every 5 million population and an ACH service for every 3 such centres is desirable.

In a globalised world that we live in, the distance between the developing and developed world will shrink. Individuals and organizations can speed up this process as time is running out for patients on an individual level.

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## **The future for new doctors**

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A recent count of the medical colleges in the country numbered 11. However, according to rumours, more medical colleges are in the offing. There are two government and nine private medical colleges presently. These enrol about 900 students every year. About one third this number is going to other countries. Thus, on an average about 1000 students are being taken into medical colleges. Every private college has to have seven beds for each student so about 700 beds have to be created in each hospital; that means the bed capacity for patients in the country is increasing. This is of course very commendable. Many of these colleges have already produced the third and fourth batches of doctors and therefore hundreds of young medical graduates are pouring out of these institutions. As the quality of medical education in these institutions plus in those outside of Nepal must be of varying standards, the Nepal Medical Council has rightfully taken up the job of monitoring the quality. This has given way to compulsory licensing exams which the students have to pass in order to practice.

Many of these medical graduates prefer to do voluntary jobs (if they are lucky to get one) after the internship rather than go out of the valley. This is an unfortunate state of affairs. In reality, these should be the very students to man the hospitals all over the country. Sadly, because of the present turmoil in the country the health centres are still going vacant. In

this scenario the silver lining that is seen is the starting of Post graduate courses by the different institutions of Nepal. As a result, now many of the bigger hospitals in the valley and elsewhere are being manned by these specialists like general surgeons, physicians and gynaecologists. All to the good. But even these general specialists are beginning to feel the need for super specialising. Fortunately, subspecialties like neurosurgery have started. This type of sub specialisation is also needed in other areas: Luckily there are plans to start subspecialties like Endocrinology, Diabetes, Gastroenterology etc; and surgical subjects like Hepatobiliary, Endocrine surgery, ColoRectal etc and many others. This is good news for these young people; that there is lots of scope for them in the future and they should not worry about not being able to specialize. And this trend will continue to grow as more specialities continue towards sub specialisation. Even a subspecialty like Plastic and Reconstructive surgery has many branches like hand surgery, craniofacial surgery, burns, microsurgery, aesthetic surgery etc. One can specialize in any one of them. So, the future is not gloomy as the fields are opening up. Now, the private medical colleges must get together and it is imperative that they start, in a combined effort these training programmes without any delay. After all the expertise is there and so are the training facilities also.

## **Treating fractures rationally**

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This is a saying in English: There is more than one way to skin a cat. Similarly, there are many ways to treat the same fracture. What was once treated almost exclusively by plasters or traction by the older generation of orthopaedic surgeons can now also be treated operatively and fixed by a variety of implants. Better operation theatre facilities and operative techniques, advances in metallurgy and knowledge of

biomechanics leading to better quality implants, better and "higher" antibiotics and, also sometimes, the patient demand for operative fixation of fractures have all contributed to more and more operative fixation of fractures. For example, a fracture of the tibia in an adult can now be treated by plaster, interlocking nails, rush nails, k-nails, plate and screws and external fixators. With the vast armament of

treatment options, good theatre facilities and skills now displayed by the adequately trained orthopaedic surgeon, there is no denying the fact that fractures can now be treated more comprehensively as compared to the 1970s and 80s.

A wise senior orthopaedic surgeon that I know, in an effort to teach us good decision-making skills, used to say that the new breed of orthopaedic surgeons are like monkeys. "Give a knife in his hand and he will cut anything. Refrain from injudicious use of the knife. Know that not all "new" things are good and not all "old" things are useless". A surgeon has to be adequately exposed to both the conservative and operative treatment options to understand the advantages and disadvantages of each, and then to decide wisely on the treatment which is in the best interest of that particular patient.

If conservative treatment of tibia in plaster is cumbersome as compared to operative treatment, it is also free from the anaesthetic and operative risks associated with operative procedures. Thus, the risk/benefit ratio must be assessed in each case of fracture tibia before deciding on the treatment option best suitable for the patient. A balanced decision making between operative and conservative options must be developed by the treating surgeon for the benefit for the injured patient.

The orthopaedic surgeon faces an additional difficulty when he decides on the conservative treatment of fractures in plasters: convincing patients whose fractures have undergone closed reduction that a hairline reduction is neither possible nor necessary. It is sometimes quite difficult to make the patient or the parents of the child who is injured understand that the reduction is "acceptable" because it will neither produce deformity nor a functional problem. They sometimes find it difficult to understand, despite patient explanation, that bones are living structures capable of healing and remodelling, unlike the legs of chairs or tables which need to be anatomically realigned for proper function. This is especially true in case of children where the "acceptability" of post-reduction x-rays is even more because of tremendous remodelling capabilities of young bones. It is in these "acceptable" reduction that the orthopaedic surgeon must educate the patients and refrain from unnecessary surgeries.

Thus, the orthopaedic surgeon treating fracture faces the sometimes tricky task of trying to decide the rational and scientific treatment option best suited for the particular patient. Decision must be balanced. Surgery may not always be the best option for the patient. If patient is treated conservatively in plaster, one should explain to the anxious patient or parents that surgery is unnecessary in "acceptable" reductions because of remodelling properties of the living bone.

## Editorials

### Cardiovascular disease in women

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World Heart Day was celebrated worldwide on 25<sup>th</sup> September 2005 with the slogan of "Healthy Weight Healthy Shape". The weight and shape of body has been given prime importance because of cardiovascular disease related to atherosclerosis like coronary heart disease and stroke. The risk of cardiovascular disease increases when the waist, just below the umbilicus is more than 37 inches (94 cm) in men and 32 inches (80 cm) in women. The BMI (Body Mass Index) more than 25 also indicates a risk to develop cardiovascular disease. Hence, the shape of the body should be pear shape rather than an apple shape.

About one third of all deaths globally i.e. 16.7 million people die of cardiovascular disease each year. Around 50 % of these deaths, 8.5 million occur among women annually. It is the largest single cause of mortality among women, accounting for a third of all deaths in this group worldwide.

The rate of cardiovascular disease in women is equally significant as in men. Although there is no true picture, available documentation show that cardiovascular disease is one of the recognizable health problems among women in Nepal as well.

The cardiovascular disease in women usually starts 10 years later than men. It is observed that in-hospital

complications and mortality is much higher in female. The rate of coronary artery disease is less before menopause, possibly because of protective effect of estrogen. After menopause, the age itself is advancing, and estrogen withdrawal may aggravate the rate of coronary heart disease.

The heart failure after myocardial infarction is higher in women. Similarly, the bleeding complication is also more in women after thrombolysis. Women were more likely to have weakened heart muscle, often time low blood pressure, and electrocardiograms that initially made it difficult to tell whether they were having a heart attack. Women are also more prone to artery spasms, such as migraine, and Raynaud's syndrome. Some women may have abnormalities in estrogen metabolism or estrogen receptors that make them more susceptible to heart disease.

Sudden overwhelming emotional states produce adrenalin surges that can stun the heart and cause stress-related hearts attacks. Older women are more affected than men by this "broken heart syndrome" because they may be more genetically susceptible to adrenalin or lack the protective effect of estrogen. Depression, conflict between spouses has also role on causing heart attacks.

The symptoms of heart attack can be different in women than in men, so the women may not

recognize their symptoms earlier and delay in going to the hospital for treatment. Once they reach the hospital, they are not often given prompt or appropriate treatments for heart attack.

Contrary to developed world, Nepal is facing another spectrum of cardiovascular disease in women – Rheumatic Valvular Heart Disease. Most of the Mitral Stenosis Regurgitation patients in major hospitals in Kathmandu and periphery are female. Most of them present to hospital when valvular heart disease symptoms manifests. So the treatment of choice remains only surgery which is less likely to be afforded by them.

With this prominent burden of cardiovascular disease in women, the complications and mortality due to heart disease is increasing among them. The chance of affecting children with cardiovascular disease is increasing and the family is being affected once housewife suffers from chronic illness. To overcome these problems, the preventive aspects have to be strengthened. Healthy eating habit, physical activity and exercise, controls of diabetes and hypertension, stress management, weight control need to be practiced. Timely treatment of sore throat with antibiotics, and prophylactic injection of penicillin for rheumatic recurrence need to be implemented with due consideration.