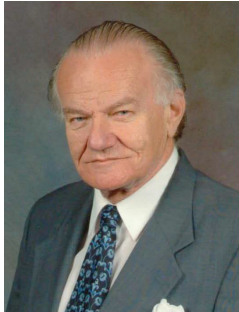


OPINION

The Guatemalan echocardiographic network



“...rural cardiac echo laboratories proved to be most effective and today perform hundreds of cardiac echocardiograms.”

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Background

In the seven countries of the Central-American subcontinent, cardiovascular disease is rampant, especially rheumatic heart valve disease. Cardiac care, especially access to cardiac surgical facilities, is limited to the public. Even today, in most of Central America, with the notable exception of Costa Rica, one may see only a few occasional cases of cardiac procedures performed by fledgling surgical programs or by visiting ‘brigades’ from the USA and Europe. Although they do good, they leave very little behind.

History

The situation was very similar in Guatemala, a country of 14 million inhabitants. The majority of them are native Maya Indians, and most of them are living below poverty levels. The first involvement the International Medical Outreach (IMO) Program had with Guatemalan healthcare was in 1972, when then-President Carlos Arana Osorio asked the authors to help establish a viable cardiology–cardiac surgery program in his country.

From there on, it was only a matter of time. The fact that the President was personally involved rapidly cut through the usual Central American bureaucratic maze. The Guatemalan Ministry of Health and Welfare assigned a

young Guatemalan surgeon, Dr Raul Cruz Molina, as the future head of the cardiac program. He immediately flew to Charlotte and began an 18-month intensive cardiac surgical fellowship at Charlotte Memorial Hospital, now Carolinas Medical Center (Charlotte, NC, USA), a facility of Carolinas HealthCare System. Simultaneously, a supportive team of Guatemalan cardiologists, anesthesiologists, perfusionists and intensive care nurses traveled to Charlotte to receive respective training. In 1974, supported by a grant from the Heineman Foundation of Charlotte and by medical colleagues from Charlotte, Dr Cruz and his team performed the first heart catheterizations and open heart operations in Guatemala. Over the next three decades, the Guatemalan cardiac program in Guatemala City grew to become what is now the Guatemalan Heart Institute (UNICAR), a nationally and internationally recognized institution and a first of its kind in Central America. Today, UNICAR performs about 2000 catheter-based procedures and 800 open heart operations a year.

Opportunities

Most recently, Dr Cruz requested assistance from the IMO Program regarding a vexing issue: despite the fact that UNICAR has satisfactory

KEYWORDS

- cardiac • echocardiogram
- rheumatic heart disease

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institutional capacity for both catheter-based interventions and cardiac surgery, the initial cardiac screening of patients for these procedures remains a problem. A considerable segment of the population, the indigenous Mayan Indians live in remote villages and are suspected of having heart disease. They have neither the means nor the will to undertake the arduous journey to be tested at the modern diagnostic facilities located in UNICAR. And, in reverse, many patients who made the journey did not need specialized services. It became evident to the authors that the basic screening of patients had to be done close to their home. The solution to this problem appeared to be the basic tool of modern cardiac diagnosis: echocardiography, which provides vital information on heart function and anatomy.

Solving the problem

With grants from the Edwards Lifesciences Foundation (Irvine, CA, USA) and the Dickson Family Foundation of Charlotte (Charlotte, NC, USA), and having continued access to the training facilities of Carolinas HealthCare System, the authors went to work. Their initial evaluation for the need of echocardiography confirmed the countrywide lack of public access to such services. Echocardiography, except in a few private clinics, was only available to the general public in the capital, Guatemala City. Even in the large rural hospitals, a single-lead electrocardiography was the highest technology diagnostic tool available.

Initial steps

To their surprise, the authors also found that Guatemala had no echo technicians, not even at UNICAR. In the USA, the recording of an echocardiogram takes 30–40 min and is performed by a technician. The scan is then ‘read’ by a cardiologist, who spends about 5–10 min to interpret it. In Guatemala, and in all of Central America, the entire process was performed by only a handful of qualified cardiologists. Thus, the authors’ first task was to train health providers, primarily nurses, to perform echocardiography. This alone tripled UNICAR’s echocardiographic capacity.

The second phase

In the second phase of their project, in concert with Dr Juan Luis Arango, Chief of Cardiology of UNICAR, and the Guatemalan Ministry of Health and Social Welfare, the authors identified ten rural hospitals in Guatemala, respectively, as future recipients of echocardiographic laboratories. In a gradual fashion, each hospital selected a nurse and sent them to UNICAR to train for a month. If the nurse proved to be interested and ready to learn, they were sent to Carolinas Medical Center in Charlotte for 3 months to be trained as echo technicians. The authors found that the training of nurses, despite some language barriers, was relatively easy. They were extremely enthusiastic to learn and soaked up knowledge at an amazing speed. Initially, they were provided with the services of a volunteer translator, ate their meals at the hospital and were housed in the IMO guest house. At the end of their training, they became proud owners of a certificate attesting their competence. It is notable that while the training of the authors’

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Figure 1. Echocardiographic laboratories established by the International Outreach Program. (A) Guatemala City (UNICAR), (B) Hospital regional Quetzaltenango, (C) Hospital regional Escuintla, (D) Hospital regional Cuilapa, (E) Hospital regional Totonicapán, (F) Hospital regional San Benito, Petén, (G) Hospital regional Quiché, (H) Hospital regional Zacapa, (I) Hospital regional Jutiapa, (J) Hospital regional Cobán, (K) Hospital Pro Familia, San Salvador, El Salvador (L) Centro Médico Clínica Ixchel, Copán Ruinas, Honduras (M) Karl Heusner Memorial Hospital, Belize City, Belize (N) Mount St John’s Medical Centre, Antigua WI and (O) Carolinas Medical Center, Charlotte. The dark circles represent functioning echo laboratories; the light quadrangles represent echo laboratories under construction; and the dark quadrangles represent functioning echo laboratories outside of Guatemala.

own echo technicians extends 2–4 years, the Guatemalan nurses were able to absorb the basics needed to perform as echo technicians in approximately 3 months.

Results

Upon completion of the training, the echo technicians were sent back to their rural hospitals with a refurbished echocardiograph machine. Due to rapidly changing technology, the IMO Program was able to acquire relatively new machines at a low cost. The machines sent back with the new echo technicians were housed in a special room and the services of an echo laboratory were made available to all physicians practicing in the area. The authors also sent their own echo technicians to work with their Guatemalan counterpart for a week or two in the new laboratory. This not only assured a smooth beginning, but also provided their technicians with a new and very gratifying experience.

Official openings of the new echo laboratories are arranged by the Guatemalan hospital, which are attended not only by the staff, but also the mayor of the town along with other local dignitaries, officials from the Ministry of Health and, in two instances, the First Lady of Guatemala. This is their way of showing their appreciation and gratitude.

Unless a physician was qualified to ‘read’ echocardiograms available at the hospital or in the area, the images were sent digitally to UNICAR for interpretation. The report generated at UNICAR was then sent back to the hospital where the study was taken. The cardiologists of UNICAR remained available for consultation by telephone, and the physicians of UNICAR were also connected by a permanent digital ‘communication bridge’ with Carolinas Medical Center for 24/7 *pro bono* consultation at request.

The arrangement described above required a lot of ground work, prodding, many site visits and countless hours of discussions. At the completion, however, the rural cardiac echo laboratories proved to be most effective and today perform hundreds of cardiac echocardiograms. This not only assisted and improved the quality of work of the local physicians but, as the authors were hoping, it made the access to UNICAR facilities possible for many patients in need and at the same time decreased unnecessary trips to Guatemala City.

Future challenges

What was expected to be a completed project has turned out to be just the beginning. Additional rural Guatemalan institutions have sent requests to participate in the network, as well as hospitals in Belize, Honduras, Nicaragua and the Caribbean (Figure 1). Expanding the network to include vascular and maternal ultrasound is on the horizon. Further information on the project can be found on the project’s website [1].

Financial & competing interests disclosure

This work was supported by grants from The Dickson Family Foundation and Edwards Lifesciences Foundation. The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript apart from those disclosed.

No writing assistance was utilized in the production of this manuscript.

Reference

- 1 Heineman Foundation of Charlotte. <http://heineman.org/guatemala-echo-project>

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