

Use of telemedicine in indigenous communities in Panama

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Abstract

Telemedicine has proven useful for providing health services to remote communities, where poverty generally and health conditions are the worst in Latin America. In Panama, a country of contrasts, where the socioeconomic status of a developed city contrasts with areas of extreme poverty in indigenous areas located sparse populations and difficult access. In order to improve the quality of health care and expand coverage of services, we installed a telemedicine program, connecting three remote health centers in the indigenous area Ngäbe-Bugle, to a San Felix rural hospital, located at south of that region. The system initially based on a wireless network using Motorola radios and satellite dishes point to point connection, has been modernized with satellite connection and link between computers instead of videophones. An international tele-pediatric program is currently executed, from the Children's Hospital Los Angeles, California, to four pediatric hospitals in Panama. The telemedicine applications have been used for pediatrics, obstetrics and gynecology, designed to control growth and development of children, immunization tracking and control of pregnancy in mothers of the community. The experience has been successful and has stimulated the establishment of other health projects in the area.

Keywords: Health Services; Telemedicine; Remote Consultation.

Resumen

Utilidad de la telemedicina en comunidades indígenas en Panamá

La telemedicina ha demostrado ser útil para la provisión de servicios de salud a comunidades de difícil acceso, donde generalmente la pobreza y las condiciones de salud son las peores de los países latinoamericanos. En Panamá, un país de contrastes, donde la situación socioeconómica de una urbe desarrollada contrasta con áreas de pobreza extrema ubicadas en áreas indígenas de poblaciones dispersas y dificultad de acceso. Con la finalidad de contribuir a mejorar la calidad de atención de salud y ampliar la cobertura de servicios, instalamos un programa de telemedicina, conectando tres centros de salud apartados en el área indígena Ngabe-Bugle con el hospital rural de San Félix ubicado al sur de esa región. El sistema inicialmente basado en una red inalámbrica, usando radios Motorola y antenas parabólicas de conexión punto a punto, ha sido modernizado con conexión satelital y enlace entre computadoras en vez de los video-telefonos. Un programa internacional de tele-pediatría es actualmente ejecutado, desde el Children Hospital de Los Angeles, California, hasta cuatro hospitales pediátricos de Panamá. Las aplicaciones médicas utilizadas han sido tele-pediatría y tele-ginecoobstetricia, orientadas para el control de crecimiento y desarrollo de los niños, seguimiento de las inmunizaciones y para el control del embarazo en las madres de la comunidad. La experiencia ha sido exitosa y ha estimulado el establecimiento de otros proyectos de salud en el área.

Palabras-clave: Servicios de Salud; Telemedicina; Consulta Remota.

Resumo

Utilização da telemedicina em comunidades indígenas no Panamá

A telemedicina tem se mostrado útil para a prestação de serviços de saúde às comunidades praticamente inacessíveis, onde em geral a pobreza e as condições de saúde são as piores da América Latina. O Panamá é um país de contrastes, onde a situação socioeconômica de uma cidade desenvolvida se confronta com áreas de extrema pobreza localizadas em áreas indígenas de populações espalhadas e de difícil acesso. Com o objetivo de contribuir para a melhoria da qualidade da assistência médica e ampliar a cobertura dos serviços, instalamos um programa de telemedicina, ligando três centros de saúde afastados na região indígena Ngäbe Bugle com o hospital rural de San Felix, localizado ao sul dessa região. O sistema inicialmente baseou-se numa rede sem fio, usando rádios Motorola e antenas parabólicas de ligação ponto a ponto, foi modernizado com conexão via satélite e ligação entre computadores, em vez de videofones. Um programa internacional de telepediatria está atualmente em execução, a partir do Hospital Infantil de Los Angeles, Califórnia, até quatro hospitais pediátricos no Panamá. As aplicações médicas utilizadas têm sido a telepediatria e a teleginecologia e obstetrícia, voltadas para o controle do crescimento e desenvolvimento das crianças, acompanhamento das imunizações e controle da gravidez das mães da comunidade. A experiência tem sido bem sucedida e estimulado o estabelecimento de outros projetos de saúde na área.

Palavras-chave: Serviços de Saúde; Telemedicina, Consulta Remota.

INTRODUCTION

Rural telemedicine is an application of telemedicine that refers to the use of information and communication technologies to take health services to very distant communities or where geographical factors hinder the accessibility.^{1,2}

In Panama, despite the geographical territory is not extensive, there are areas of difficult access with sparse health services and others that are destitute of these.

One of the main areas is the indigenous Ngäbe Bugle, consisting of a mixture of tribes reaching a population of 200,000 inhabitants and it is located between the provinces of Veraguas, Chiriqui and Bocas del Toro towards the west of the country. 'Comarca' is the term used by the governors to designate the area corresponding to this population, giving it a certain character of autonomy and restriction on the arrival of people from other places in order to protect their nature and historical heritage.

It is also the poorest area of the country where the indigenous work with rudimentary agriculture, hunt and fish in the rivers of the place.

Here, the distances are not very long, but the roads of access are very bad, often crossed by rivers that grow in the rainy season, making more difficult the passage of vehicles. The ones seriously ill are transported in hammocks supported by indigenous that take them for long hours walking to the only referral hospital, the Hospital of San Felix, located near the Interamerican Highway.

Using the resources offered by the telemedicine and telehealth in the circumstances described previously, we have developed a program that has allowed to improve the conditions of health care significantly in an important part of the region.

METHOD

For 2004, we designed a telemedicine project that would allow us to perform medical consultations from remote areas to the Rural Hospital of San Felix (HSF), located 3 kilometers from Interamericana Highway. We chose the HSF as the local site of teleconsultations and three distant health facilities, located in the mountains as remote places: the health center of Hato Juli, the health center of Cerro Iglesias and the health center of Hato Chami.

The health center of Hato Juli (HJ) is located 10 kilometers from the consulting location, with poor access roads; an hour and a half on foot, serves a population of about 1,000 inhabitants scattered over a large territory.

The Cerro Iglesias health center (CI) is 16 kilometers from San Félix Hospital and serves a population of 3,300 people. There is no electricity, so as to implement the service, it was necessary to install solar panels and batteries to store energy and feed the system.

The health center of Hato Chamí (HC) is located 43 kilometers from San Félix Hospital and serves a population of 3,500 inhabitants.

In each of the teleconsultations, we put posters written in an easy way on the wall, explaining how the system works and what to do in case failures occur. (Figure 1)



Figure 1 - Telemedicine office at San Felix Rural Hospital.

Telemedicine System

For creating telemedicine stations, we use a video-phone (Video-phone StarView) with an electronic stethoscope as a medical peripheral attached to a microwave radio (Motorola Canopy W14) as a wireless communication system point to point. Some Andrews satellite dishes, placed at each site with line of sight to its counterpart in the HSF, were the focal points with a bandwidth of up to 30Mbps, to achieve data transmission, clinical image and clinical sound.

It was installed offices in the HSF and in the three consultant remote stations in HJ, CI and HC sites. In HJ it was installed solar panels on the roof of the place in order to get solar energy, in which it was stored in a battery system to which the system equipments were connected.

The beginning of the system operation was preceded by several meetings with doctors leaders and community leaders as well as several training sessions to the staff, especially because the population was totally unaware of the use of information and communication technologies.

Evolution

By 2013, we replaced the microwave-based intranet by satellite link between the HSF and the three remote centers. We added a fourth remote center of health in the rural Hospital of Soloy (HS) located 40 kilometers from the HSF.

Videophones have been replaced by computers equipped with microphone, cameras and high-definition monitors.

The HSF has been connected to Hospital of Obaldia (HO), a referral maternity and child hospital with 350 beds, located in the city of David, 93 kilometers away. We used the T-consult of AFHCAN telehealth solutions³ software, distributed by AMD.

RESULT

During ten years of work in telemedicine and telehealth in this indigenous region, health care has improved dramatically. What at first it was seen as difficult and complicated, now it has turned into a routine activity, whenever a teleconsultation is required. We have added to the initial program, a complete system of Continuing Medical Education at a distance, with activities in real time, generated from the Children Hospital of Los Angeles, California. This program consists of a series of formal videoconferences in pediatric topics once a month; virtual meetings once a month with pediatric residents from Panama and Puerto Rico; discussion of clinical cases and short seminars on obstetrics issues.

It has been added to the system an obstetric ultrasound team, allowing to implement an obstetric tele-ultrasound program, which facilitates making at least one ultrasound to all pregnant women who previously went to the delivery room without medical supervision and without ultrasound image.

This latter program is having a major impact on reducing maternal and neonatal morbidity and mortality in the area, which is one of the highest in the country.

The health staff feels satisfied to have specialized help in their workspace, as with having a better access to medical scientific updated information. The community is confident in the health system, which now it has the support of specialized medicine at distance.

Although the system was not designed to provide emergency services, it has been helpful in some cases, when the lack of qualified staff was requested; examples like these have been to give medical aid to patients bitten by snakes, patients with bronchial asthma crisis and patients with seizures.

Similarly, the simple fact of having a telemedicine system allows the communication of transfer and evacuations of patients with serious conditions, facilitating the preparation for their hosting in the HSF or HDO.

DISCUSSION

Obviously, the telemedicine is not the solution to all problems in the rural communities, but it is a great support to many health problems, which probably can not be solved in another way in many years.⁴

In Latin American countries, still exist significant differences of health care in remote areas. The causes are many and range from the lack of economic resources, the difficulties of accessibility to these areas, the absence of communication infrastructures, to the lack of trained staff who want to work with these populations. Health professionals always prefers to concentrate on the main urban areas, where there are greater opportunities and where access to knowledge and technologies is better.

That is why telemedicine has the possibility to increase communication between health professionals, exchange views, stay updated, create the feeling of being supported social and professionally, even when they are away from large cities.^{5,6}

This program has been the first of many health activities that are being generated in the area, initially stimulated by the increased communication and sense of support that the telemedicine system provides constantly.

CONCLUSIONS

The installation of telemedicine systems in rural communities must be based on the interests and needs of this population. A consensus with local health authorities and leaders and indigenous authorities who have achieved a significant level of development in the region in defense of their culture should be established.

Despite the lack of knowledge in communication technologies, the system has been widely accepted and today it is used with great satisfaction by health professionals. Training and continuing education in this aspect have been the key to this latest achievement.

Telemedicine has a great utility in rural areas where basic medicine is practiced and there are no medical specialists.

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