

Original Article

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Lack of access to paediatric cardiology services in the public health system in four major urban centres in Perú

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Abstract

For one-third of the Peruvian population living in large cities outside the capital city Lima, there is no access to paediatric cardiology services provided by the public health care system. Children with suspected CHD living in these areas are referred to the adult cardiologist working at the regional hospitals for care and treatment. This is a consequence of the universal health care system and the heavily skewed distribution of the health care workforce towards the capital city of Lima. This imbalance has resulted in a severe shortage of paediatric cardiologists practicing outside of Lima and the adult cardiologists that remain are left to make up for this deficit.

To gain a better understanding of the current model of care for children with suspected CHD within the public health care system in Peru, we surveyed adult cardiologists from four major urban centres that serve one-third of the Peruvian population outside of Lima. We determined that adult cardiologists spend a significant amount of time treating children, but lack the specialised training and equipment to provide model care. The cardiologists indicated that receiving additional training and appropriate equipment would help enable them to provide proper care for these children.

On the basis of the available published literature, the worldwide incidence of CHD ranges from 7 to 9 per 1000 (0.7–0.9%) live births, with estimates up to 12 per 1000 (1.2%) live births being reported depending on the diagnostic timing and rigour.¹ A global survey on the burden of disease conducted in 2010 reported that 96% of all infant deaths due to congenital anomalies occurred in low- to middle-income countries.^{2,3} In all, one-third of all major congenital anomalies are reported to have heart defects.^{1,4} This is in stark contrast to high-income countries where CHD affects millions. The burden of CHD has recently been described in an important article within a special supplement of this journal.² In this article, it was pointed out that there is a paucity in the CHD data from low- to middle-income countries because of inadequate infrastructure for diagnosis and management of CHD.³ However, this can also be a problem for some middle- to high-income countries where there is a shortage of paediatric cardiologists because of inadequate training programmes in paediatric cardiology, as well as a scarcity or inequitable geographic distribution of the number of accessible paediatric cardiologists.^{5–8}

Peru is a country located in South America with a population of ~30,000,000 people. On the basis of the World Bank Atlas, Peru is considered an upper middle-income country, but is best described as an emerging market economy owing to its economic volatility and income inequality.⁹ The population and income distribution is heavily skewed towards the coastal and metropolitan regions, the capital city of Lima in particular.^{9–14} Approximately 60% of the population lives primarily within major cities in the coastal region, whereas just over 20% live in remote and rural communities. Income inequality is also substantial, with ~30% of the population still living in poverty, which remains highest in the rural communities.

Most of the health resources in Peru are also concentrated in the capital city of Lima, where 35.2% (221 of 628) of all hospitals and 56% of all Peruvian medical specialists practice, including 55.6% of all cardiologists (69 of 124) and 61.7% of all paediatricians (562 of 911).^{15–17} This also includes most of the advanced health care services, including the only two Ministerio de Salud public health care system hospitals that perform paediatric cardiac surgery

in Peru.¹⁸ However, only 34% of the 31.3 million people in Peru reside in the capital city. This presents challenges to the implementation of universal health care, fiscally and logistically, as well as creating highly underserved regions.

Currently, there is scarcity of data showing the model of care of children with CHD in smaller urban centres, despite having a large number of inhabitants that lack paediatric cardiology services. This is a significant issue that affects not only the patients but also their families, local hospitals, and the tertiary centres with long waiting lists and an overwhelming number of referrals. We sought to determine the current state of access to paediatric cardiac services in four major urban centres outside of Lima in Peru, within the Ministerio de Salud public health care system, which serves the lowest socio-economical population with no access to private health care or insurance.

Materials and methods

We first identified four of the most populated cities in Peru outside of Lima in which to conduct the survey. The four cities selected, two located in the north and two in the south, account for ~20% of the Peruvian population: Cusco city in Cusco serving a population of 1.3 million, Arequipa city in Arequipa serving a population of 1.3 million, Piura city in Piura serving a population of 1.8 million, and Trujillo city in La Libertad serving a population of 1.8 million.¹⁶ Using a web search, we located the names and telephone numbers of the Ministry of Health (Ministerio de Salud) hospital(s) in these cities. We selected the hospitals with the largest paediatric and cardiology referral base. We contacted each of the hospitals and requested to speak with a paediatrician.

We asked the paediatricians about patient access to paediatric cardiology services and learned that there were no paediatric cardiologists available in any of the hospitals we contacted. What we learned is that all children with suspected CHD are referred to adult cardiologists who have interest in CHD for a consult. Thus, to better understand the training of these adult cardiologists, and resources available in these hospitals, we designed a paper survey (Supplementary Appendix 1) to be completed by the adult cardiologists managing these children. We visited the previously contacted hospitals and met with paediatricians and the adult cardiologist who is most interested in the management of CHD patients to conduct the survey. Only four hospitals were selected to visit and conduct the survey owing to time and financial constraints.

The survey consisted of 14 questions, two of which had multiple sections (Supplementary Appendix 1). Likert scales were used to score the responses. Questions about proportions were divided as follows: never = 0%, occasionally = 30%, sometimes = 50%, frequently = 70%, and every time = 100%. On questions of opinion, the options included were strongly disagree, disagree, neither agree or disagree, agree, or strongly agree. Frequency analysis was performed on each survey question using the software SPSS v.23 (IBM Corporation, Armonk, NY, USA).

Results

We surveyed eight adult cardiologists typically referred to by the paediatricians and were willing to participate in our study. This included at least one adult cardiologist from each hospital: three

from Arequipa, two from Cusco, two from Trujillo, and one from Piura. The results from the survey are presented in Supplementary Appendix 2.

From the survey we learned that all cardiologists surveyed were involved in the diagnosis and management of children with CHD at least 50% of the time. For six (75%) of the cardiologists, this represented around 50% of their total practice time, whereas the remaining two (25%) cardiologists were split between 30 and 70% of their total practice time. When we asked how much training they have received in paediatric cardiology, it was equally divided between 3 months or less and >3 to 6 months.

Next, we inquired about echocardiography training and use. We found that three cardiologists had <3 months, two (25%) had 3–6 months, two (25%) had 1–2 years, and only one (12.5%) cardiologist had more than 2 years of training in the use and interpretation of echocardiography. Furthermore, five (62.5%) cardiologists have access to an echocardiographic machine at least 70% of the time, and only one has access to a machine all the time. With respect to the use of echocardiography, only three (37.5%) of the cardiologists use echocardiography every time and seven out of eight cardiologists perform their own echocardiograms. Over one-third of the cardiologists also stated that diagnosis of CHD in children was difficult. When we asked whether the medical management of children with CHD is difficult, three (37.5%) disagreed, four (50%) neither agreed nor disagreed, and only one (12.5%) agreed.

Finally, when asked how the model of care could be improved, six (75%) indicated that they would like more training in CHD diagnosis and management, seven (87.5%) would like training in paediatric echocardiography, seven (87.5%) would like to update or get a new echocardiographic machine, and seven (87.5%) would like to be able to access a paediatric cardiologist for a clinical and echocardiographic second opinion.

Discussion

The most important finding of our research is that in the public hospitals located in four of the biggest cities in Peru outside Lima, providing service to ~20% of the Peruvian population, there are no paediatric cardiology services. Specifically, there are no physicians, nursing, or other medical personnel trained in CHD or acting as a unit specific for CHD diagnosis and management. Importantly, the paediatricians and neonatologists will consult cardiologists who have an interest in CHD. However, these adult cardiologists are not adequately trained, usually having only 2–3 months of training in CHD compared with the 3 years of training in paediatric cardiology. As a result, it is understandable that most are not comfortable diagnosing and managing these patients. This is further compounded by a lack of access to the appropriate diagnostic tools, such as echocardiography, and supporting infrastructure.¹⁹ The end result is a delayed diagnosis, which ultimately leads to increased patient mortality and morbidity.^{20–22}

A recent global statement released by the Paediatric Cardiac Intensive Care Society recognises the universal problems associated with paediatric cardiac care and is working towards developing universal best practices to address both the unique and common problems, as well as the shared needs and goals among all health care workers caring for paediatric cardiac

patients across the globe.²³ One such problem is the limited access to proper training and the lack of resources available to trained staff. Although this article cites low- and middle-income settings, the problem still remains within low-income regions of middle- to high-income countries.

Although the universal health care coverage in Peru has increased at an impressive rate since its introduction, it has been faced with fundamental problems such as the funding models, fiscal sustainability and accountability, resource inefficiencies and wastage, as well as a disconnect between the health services available and the populations they serve.²⁴ Peru also has one of the lowest total health expenditure in Latin America and health spending has not kept pace with economic growth rates, creating deficits in infrastructure, equipment, and human resources.²⁴ These difficulties have resulted in substantial gaps in population health coverage and with retention and recruitment of health care workers in rural and remote regions.²⁵

The health care system in Peru is complicated as it is segmented into both public and private sectors, and is financed through government tax revenues, employer contributions, out-of-pocket payments, or a combination thereof. The public health sector includes three main providers: the Ministry of Health (Ministerio de Salud), which provides the comprehensive health insurance programme Seguro Integral de Salud, the EsSalud, which that provides the social security health insurance, and the Fuerzas Armadas and Fuerzas Policiales health funds for the national police, army, and air force.²⁴ The private health sector includes private insurance companies, providers, medical doctors, and other health professionals, as well as non-profit groups and providers of indigenous medicine. All of these providers are administered and organised independently and provide their own infrastructure, including hospitals, clinics, and laboratories.

The Seguro Integral de Salud is almost entirely publicly funded by government tax revenues – indirectly contributory – and provides coverage primarily for those living in poverty, whereas EsSalud is funded by employer contributions of formal workers – directly contributory – and private care is paid directly by the consumer. Thus, if an individual does not have health care provided by their employers – such as EsSalud, Fuerzas Armadas, and Fuerzas Policiales – or private insurance, they must obtain all of their health care services from the Seguro Integral de Salud public health care system or pay out of pocket if they are ineligible for Seguro Integral de Salud. The majority of people in Peru have health insurance covered by Seguro Integral de Salud (35.3%) or EsSalud (25.3%); however, 34.6% still have no health insurance coverage.²⁴ Not surprisingly, the distribution varies by region as the poorer regions have a larger proportion of the population covered by Seguro Integral de Salud. Those without insurance include many who are not eligible for either Seguro Integral de Salud or EsSalud, cannot afford private insurance, and are reluctant to affiliate with a semi-contributory programme also operated by the Seguro Integral de Salud.²⁶

Although the public health sector serves a large proportion of the population, there is a severe shortage of health care workers within this sector. Following graduation, only 8–45% of physicians, nurses, and midwives are entering the public health care sector.²⁷ This is particularly problematic for clinical specialists, as only ~10% of those who completed their residency stayed in the public sector. This has created a large gap of ~45% between the demand and the current pool of medical specialists, both clinical

and surgical, in Peru.¹⁷ This is not because of lack of trained graduates, but a problem of recruitment and retention, including health care workers leaving for the private sector or emigrating.²⁷ The national university census conducted in 2010 reported that 78% of medical students, 67% of nursing students, and 60% of midwifery students intend to migrate from Peru.²⁴ However, emigration may decline as a result of increased private health care expenditure.²⁸

There is also a large discrepancy in conditions, salaries, and benefits between the private and public sectors, making the private sector far more attractive to potential employees.²⁴ A similar problem exists between the urban and rural regions, where urban-based jobs also offer increased wages, stability, opportunity, and standard of living.²⁷ Physicians were reported to be five times, and nurses and midwives 14 times, more likely to favour a job in urban areas over more rural and remote areas.^{27,29} The current distribution of the health care workforce in Peru is substantially skewed towards the urban areas, especially in Lima. There are 7.7 doctors per 10,000 people in Lima, whereas the majority of rural areas have fewer than four doctors per 10,000 and some regions are near two per 10,000.^{29,30} A similar problem with nurses and midwives has also been reported.^{24,31}

The differences are even greater for clinical specialties. Over 55% of all clinical specialists, including 62% of all paediatricians and 56% of all cardiologists, are located in metropolitan Lima, an estimated 2.5–7 times more than required.¹⁷ Outside of Lima, there are ~55 cardiologists and ~350 paediatricians serving almost 21 million people in Peru.¹⁷ In some of the poorest regions, the deficit gap is considerable, where only 10–20% of the demand for clinical specialists is being met. In Piura, with a poverty rate between 32.4 and 36.1%, only 12–16% of the needs for specialists are being met, whereas in Cusco and La Libertad, with poverty rates between 20.6 and 24.7%, only ~24% and 40% of the needs are being met, respectively.^{14,17}

Our survey of cardiologists working in the Ministerio de Salud public health sector outside of Lima indicates a substantial gap in the model of cardiac care. Although Peru is a middle- to high-income country, it is still faced with problems most often associated with those of lower income. This is partly owing to health care workers striving for a better quality of life through emigration or employment in the private sector. This has created a substantial imbalance in the public health care workforce in Peru by generating a surplus in Lima and a deficit everywhere outside of the capital city. The unfortunate consequence is that the regions and populations that have highly needed access to public health care are not being adequately serviced. For example, the infant mortality rate is two to three times higher in the poorer regions of Peru, such as Piura with 26 per 1000 live births and Cusco with 30 per 1000 live births, compared with Lima with 13 per 1000 live births. This is further compounded by poor infrastructure and lack of access to specialised care.

We found that five cardiologists received 6 months or less training in echocardiography. Compounding this problem is the lack of access to echocardiographic machines; only one adult cardiologist in the four cities has access to an echocardiographic machine 100% of the time and four cardiologists have some access 70% of the time. This limited access is because the echocardiographic machines do not belong to the Cardiology Department, but in most cases to the neonatal ICU, with the exception of Cusco where cardiology has their own. However, in

Cusco only one cardiologist actually uses their machine for the diagnosis and management of patients.

The lack of access to specialised care and proper diagnostic tools undoubtedly delays timely diagnosis of CHD. Trucco et al. (2011) reported that the detection rate of CHD in Guatemala in 2006 was only 14% of the 3935 estimated cases, far lower than expected, despite access to a high-quality cardiac care centre at low to no cost.³² The children diagnosed with CHD also had a higher incidence of simpler lesions and were diagnosed at an older age. The authors also found a relationship between these findings and an index of socio-economic status; a lower human development index indicated a lower percentage of patients with CHD detected.³²

It is important to emphasise that access to patient data is not readily available. No electronic record-keeping systems or databases exist at these hospitals. Thus, to determine the exact number of children with cardiac problems, their diagnosis, management, and treatment plan by the adult cardiologist in these hospitals is very difficult. This is why we had to rely on the cardiologists we surveyed to describe the percentage of children that they see.

Owing to the high prevalence of CHD, more trained paediatric cardiologists are needed in areas of low socio-economic status and poverty. However, there is not enough training programmes in Peru, and the few programmes that exist are in Lima. It is also not clear whether this problem is similar in other South American countries, but the shortage in health care workers is a shared problem. More research is needed to establish the model of care in developing countries in this region. Although it is ideal to train paediatricians in paediatric cardiology, as an interim and immediate measure, the adult cardiologists currently looking after these children need access to specialised training, better diagnostic equipment, and ongoing support by established paediatric cardiologists.

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