Latin America and Latin America nephrology – a brief introduction

The part of the globe conventionally known as Latin America comprises an area of 19,197,000 km², with a population over 600 millions of inhabitants living in 21 countries, from Mexico to Uruguay. This vast geographic region is divided in four sections: North-America, Central-America, the Caribbean, and South-America. The ethnicity of this population is a complex mixture of Native Americans, Europeans, African and Asian people, likely making Latin America as one of the most diverse ethnic areas of the world. The two dominant languages spoken are Spanish (Mexico, Cuba, Dominican Republic, and Puerto Rico, and the majority of Central and South America) and Portuguese (Brazil).

Latin America has four megalopolis over 10 millions inhabitants (Mexico City, São Paulo, Buenos Aires and Rio de Janeiro) and areas almost inhabited, such as the Amazon forest, the Atacama Desert and Patagonia. Indeed, one of the main characteristics of Latin America is the profound socio-economic heterogeneity among countries, and even among areas of the same country. The gross domestic product per capita ranges from US$ 19,474 to 1,358 and the human development index from 0.819 to 0.456. As expected, these inequalities have an important impact on the pattern of diseases affecting the Latin America population, and in the way the national health services are organized and provided.

The nephrology medical community in Latin America is represented by the Latin American Society of Nephrology and Hypertension (SLANH), founded in 1970, which is composed by 22 National Societies from 20 countries (Mexico has three societies) representing over 5,000 nephrologists. The first SLANH president (1970-1972) was Professor R. Miatello, from Argentina, followed by 15 presidents from diverse countries. There have been already 16 Congress of the SLANH in the last 30 years (from 1972 to 2012), and Latin America has hosted three Congress of the International Society of Nephrology: 1972 in Mexico City, Mexico (2,650 participants); 1999 in Buenos Aires, Argentina (3,120 participants) and 2007 in Rio de Janeiro, Brazil (6,200 participants).

SLANH and the European Renal Association - European Dialysis and Transplant Association have developed solid scientific and educational links for a long time, and we hope to provide a glimpse on the Latin American nephrology for the readers of NDT.

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The second part of the South American Newsletter will be published next week.

Trends in Renal Replacement Therapy in Latin America
Data from the Latin-American Registry of Dialysis and Renal Transplantation, launched by the Sociedad Latinoamericana de Nefrología e Hipertensión (SLANH) in 1991 (1), show a progressive increase in the prevalence of chronic kidney disease (CKD) patients on renal replacement therapy (RRT) in the region (Fig 1).

The prevalence of patients either on dialysis or with a functioning graft in 2010 was 610 patients pmp, six times more than in 1991. This is indeed a major growth for a developing region of the world such as Latin America (LA). This increase in RRT is likely the result of an effort to improve the access to the health care system, the increased availability of resources for RRT and, in some countries, a possible increase in prevalence of advanced CKD. However, a great regional disparity exists (Fig 2). Some countries, such as Puerto Rico, Chile and Uruguay, had an RRT prevalence in 2010 exceeding 800 patients pmp, whereas in other countries, the prevalence was less than 400 patients pmp.

Currently, most Latin-American governments recognize that CKD is a public health problem, and projects for early CKD diagnosis and prevention are being developed. In some countries, prevention programs have been in operation for more than eight years. Likewise, some governments in the area now recognize the urgent necessity to implement programs to provide RRT to the entire population.

Based on these data, SLANH estimates that the regional prevalence of CKD on RRT will continue growing in the coming years and will presumably reach 900 patients ppm by 2020.

In our opinion, RRT programs should place emphasis on renal transplantation (RT), considering that RT provides better survival and quality of life, and the long-term costs are lower in RT than in chronic dialysis. In addition, we believe that the major emphasis should be placed on peritoneal dialysis (PD) in most LA countries. PD requires less investment and is an interesting alternative for countries which lack the medical infrastructure and have a complex geography. PD treatment in LA represents only 6% of the total RRT prevalence, if we exclude the three LA countries with the greatest development in PD treatment (Mexico, Colombia and El Salvador).

The expected increase in RRT prevalence may be delayed by the lack of nephrologists in the region. In 1996, when there were only 200 patients ppm on RRT in LA, the region had eight nephrologists pmp (2). The growth in the number of nephrologists has not paralleled the increase in the number of treated patients. The current rate for the area (14 nephrologists pmp) is insufficient for the kidney disease demand, and unfortunately there are also countries with less than five nephrologists pmp (Fig 3). If this growth trend does not change, the nephrologist gap will be even more pronounced in the coming years.

To accomplish the implementation of prevention programs, and to enable increased access to RRT, SLANH estimates that a total of 20 nephrologists pmp will be required in 2020.

In summary, we anticipate a continued and dramatic increase in RRT prevalence in LA in the next seven years, due to an improvement in health care access and the other factors discussed above. SLANH is strongly encouraging nephrologists and the country’s health authorities to develop prevention programs and to increase RT and PD treatment options. SLANH is also encouraging the national societies of nephrology to implement programs to increase the number of nephrologists in LA and to adapt the nephrology education programs to the current needs.

Figure 1
Figure 2

Evolution of prevalence (pmp) of RRT in Latin America (1991 – 2010)

Figure 3

Prevalence of RRT in Latin America – 2010

LA average – 610 patients on RRT/ pmp
Acute Kidney Injury in Latin America

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Latin America is a subcontinent composed of 21 countries with a wide diversity of cultures, languages, geography and striking differences in the socio-economic conditions of the population. More than 590 million people live in the region, some of them in megalopolis as Mexico City and Sao Paulo and others in isolated regions as deserts, forests or mountains. Heterogeneity is not only related to geography but also to economic, cultural and social condition of the population. In fact, GNI per capita ranges from $700 to 12,280, life expectancy from 62.1 to 79.3 years, and health expenses from $23.9 to 4,432 per person-year.

Acute kidney injury (AKI) is a frequent and serious clinical condition, highly dependent on the clinical scenario in which occurs (community, hospital, ICU), patient characteristic (age, comorbidities), and the socioeconomic context (poverty, accessibility to health system). Moreover, AKI surviving patients are more likely to develop late CKD, ESRD, cardiovascular events and premature death as demonstrated by recent epidemiologic and observational studies.

The real incidence of AKI is very difficult to establish due to the lack of a uniform definition, the variability of settings in which occurs, and the diversity of the characteristics of patients affected.

Information on the characteristic and incidence of AKI in Latin America is limited. It has been postulated that in Latin-American countries, as in the rest of the developing world, AKI has a bimodal pattern. In developed areas of some countries the pattern is similar to that found in USA and West Europe: predominantly hospital-acquired AKI, affecting mostly severely ill older patients with previous comorbidities. In this setting AKI is caused predominantly by ischemia (sepsis is the principal etiology) and/or nephrotoxic drugs (mainly antibiotics). This profile coexists with a totally different pattern seen in rural and/or poorer areas. In these locations AKI will affect mainly young and previously healthy individuals, and will be strongly influenced by
environmental conditions and the socioeconomic and cultural status. Infectious diseases such as leptospirosis, malaria, dengue, Hantavirus, community acute diarrhea; exposure to animal venoms; septic abortion; use of traditional herbs are prevalent causes of AKI in this setting. Natural disasters such as earthquakes and flooding can add to these diseases burden. In the same tertiary hospital the usual and prevalent nosocomial sepsis may share the ICU with malaria, leptospirosis, or dengue. A recent survey performed by the AKI Committee of the Latin American Society of Nephrology and Hypertension (submitted) with data from 264 RRT Units found community-acquired diarrhea, leptospirosis, and hemolytic-uremic syndrome as the main particular causes of AKI in Latin America.

The increasing incidence of AKI, its association with severe in-hospital and long-term complications and death, the rise in costs and the potentially preventable nature of AKI, make it as a major public health issue. For these reasons it was selected by the ISN for the World Kidney Day 2013 celebration. According to large epidemiological studies in USA the incidence of AKI has been estimated between 322 to 522 cases per 100,000 pop. These figures will project the occurrence of approximately 1,800,000 to 2,900,000 new cases of AKI annually in Latin America. Among them, about 20 to 60% will die, which is a number substantially higher than those who die from car crash (19.7/100,000 pop), and similar to those who die from communicable diseases (55.5/100,000 pop), ischemic heart disease (57.3/100,000 pop), diabetes (36.0/100,000 pop) and cerebrovascular disease (42.8/100,000 pop) according to the Pan-American Health Organization data.

Leptospirosis is an important cause of AKI affecting young and healthy individuals in many Latin America countries. This infection disease caused by spirochets is prevalent in humid tropical and subtropical areas and due to global warming the World Health Organization has included leptospirosis as one of the a re-emerging infectious diseases in both developed and developing areas. The number of affected individuals range from 0.1 to 1 cases/100,000 pop per year in temperate climates to up to 10 times more in humid tropics, mainly in the rainy season with flooding. Leptospirosis is a febrile illness affecting mainly young men, and frequently is misdiagnosed due its clinical course similarity with influenza, dengue fever, and other viral diseases. Indeed, leptospirosis is largely underreported. Renal involvement is almost universal, (acute interstitial nephritis) and AKI occurs in 40 to 60% of cases. Typically, is a non-oliguric, hypokalemia AKI, due to the inhibition of Na+,

Viral hemorrhagic fever is a group of diseases caused by RNA virus from four different families. They are transmitted through bite of arthropods or the exposure to infected rodent excreta. Dengue, Hantaan, and yellow fever are associated to AKI, although the real incidence of acute kidney injury in these diseases is unknown. The incidence of dengue is rising remarkably worldwide (about 100 million people annually), challenging the health system from the primary to the tertiary care level. The most severe forms of dengue (dengue hemorrhagic fever and dengue shock syndrome) are associated to increased vascular permeability, plasma leakage and hemorrhagic phenomena. In this situation AKI has been reported in up to 5 % of the cases.

Malaria is a mosquito-borne infectious disease that affects about 400 million people annually in more than 100 countries of the developing world. One of the main reasons for the expansion of malaria is the combination of health systems limitations and large populational growth found in many developing countries. Malaria is a major public health issue in Latin America, although their frequency is lower in comparison to sub-Saharan Africa. The reported incidence of AKI varies widely, from 2 to up to 39% in the severe forms of the disease, and it is associated to severe volume depletion, jaundice, and intravascular hemolysis.

Animal venom-induced AKI caused by venomous snakebite (Bothrops and Crotalus genus) and arthropods (European and Africanized bees, wasps, caterpillars of the genus Lonomia and spiders of the genus Loxosceles) is a significant problem in diverse tropical countries in Latin America. The etiology of AKI in these accidents is complex comprising venom direct nephrotoxicity, renal vasoconstriction, rhabdomyolysis, hemolysis, systemic hemodynamic disturbances and fibrin deposition in the glomeruli. Venomous snakebite is the most frequent cause of animal venom-induced AKI in Latin-America. It affects mainly healthy and young rural workers, causing significant socioeconomic burden to rural communities. AKI is considered the principal cause of death in individuals surviving the early effects of snake venom.

REFERENCES


The financial and social challenges of CKD programmes in Latin America - a Brazilian Experience

Daniel Rinaldi dos Santos, Elizabeth de Francesco Daher, Lúcio Roberto Requiao Moura, Maria Tatiana Novaes Rezende, Maria Almerinda Ribeiro Alves, Roberto Flávio Pecoits Filho, Rogério Baumgratz Filho. Sociedade Brasileira de Nefrologia/2013-2014

Noncommunicable diseases (NCDs) are the most common causes of morbidity and premature mortality worldwide. In fact, cardiovascular disease is currently responsible for about 30% of all the deaths in the world.
The prevalence of cardiovascular disease has increased gradually, especially in developing countries, including Brazil, due to the accumulation of traditional risk factors as hypertension and diabetes. Also, the increase of the life expectancy, and consequently the ageing of the population, contributes to the demographic transition observed in the last few decades in developing countries (1). Beyond these factors of traditional risks, chronic kidney disease (CKD) has been described as one of the main determinants of risk for cardiovascular events. Brazilian data on CKD are scarce; however, a study carried out in 2 thousand individuals in Bambuí, a city in the state of Minas Gerais, detected increased serum creatinine in 0.48% to 8.19% of the assessed population, which was more frequent in elderly individuals (2).

In accordance with the Brazilian Census of Dialysis published in 2012 by the Brazilian Nephrology Society, the number of patients with CKD requiring dialysis as renal replacement therapy (RRT) in Brazil almost duplicated in the last decade. It increased from 42,695 in 2000 to 91,314 in 2011, with a rate of 475 patients on RRT per million population (pmp), with more than 28,000 new patients initiating RRT per year (3). In this dialysis population, 57% are male and the most frequent etiology of CKD is hypertension (35%), followed by diabetes (28%). Thirty five percent of these patients are above 65 years-old, the annual mortality rate is 15%, and the monthly hospitalization rate is 6%. Only 10% of these patients are on peritoneal dialysis.

Despite these increasing rates, the prevalence of patients on RRT in Brazil is lower than in countries with similar characteristics, suggesting that part of this population does not reach the health resources. These numbers reinforce the need for early identification and adequate treatment of patients at risk for CKD, aiming at their integrated care.

Regarding kidney transplantation, Brazil is the second country in absolute number of procedures, and has the largest public program of transplantation in the world. In 2012, 5,385 kidney transplants were performed, 1,448 from living donors and 3,937 from deceased donors. More than 32,000 patients were in the waiting list in the same year (4).

A telephone survey performed yearly by the Brazilian Health System found that 30 million (out of 132 millions of inhabitants) mentioned a history of hypertension, 7.4 million reported diabetes, 20 million reported obesity, and 17 million were elderly, which represents a large number of population at risk for CKD (5). The extrapolation of data from international studies estimate that fifteen millions of adult Brazilians may present CKD stages 1 to 4 and 6,6 million moderate CKD (stages 3 to 4). Unfortunately, the majority of these patients start RRT with late referrals through the Tertiary Care. In 2011 in São Paulo city, 2,123 patients initiated dialysis, an incidence of 188 pmp, and 75% of them were unaware of having CKD, until the initiation of RRT.

There are 3,000 nephrologists in Brazil (1 per 60,000 inhabitants), but the country distribution of these professionals is extremely heterogeneous, with significantly low number of nephrologists in the North and Northeast areas (1 per 150 thousand and 1 per 100 thousand, respectively). Only 350 out of the 5,556 Brazilians cities have RRT services and active nephrologists.

Currently, 85% of the dialysis therapy is financed by the Public Health System (Sistema Único de Saúde, SUS), with a reimbursement of approximately 60 Euros per session and an annual cost of 700 million Euros, equivalent to approximately 2% of all the Public Health System expenses.

Finally, it is noteworthy to mention that a Brazilian Renocardiovascular Network is under development, which will integrate the primary care and the nephrology units. In this network the care for CKD stages 4 and 5 will be undertaken by a multi-professional team, including nephrologists. The Brazilian Public Healthcare System must incorporate CKD as a priority in the primary care, aiming the reduction of cardiovascular mortality, renal disease progression and prevention of the late referral of CKD patients. The CKD clinics should supervise the primary care team, be in charge of patients with advanced stages of the disease (CKD 4 and 5), and prepare the patients for RRT, when necessary.

Brazilian government, who reimburses an enormous (but insufficient) cost of renal replacement therapy, must incentivate programs oriented to early detection and prevention of renal disease. We project that the increasing expenses of the Public Health System with noncommunicable diseases in individuals at risk in Brazil will be reduced with the development of programs of prevention of these diseases at the primary care level and with a timely referral of renal disease patients to CKD clinics.

References