

CURRENT STATUS OF RENAL REPLACEMENT THERAPY IN CUBA 2006

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We present the main structural and organizational features, as well as the human resources and the activities of Cuba in nephrology, dialysis, and transplantation. Access to renal replacement therapy is universal (not restricted). There are 47 hemodialysis services. There are 281 renal physicians (216 serving adult patients and 65 pediatric nephrologists). The incidence of renal replacement rose from 71 per million population (pmp) in 2000 to 98 pmp in 2006. The prevalence of patients on dialysis treatment increased from 100 pmp in 2000 to 194 pmp in 2006. Growth rates for dialysis increased by an average of 10.6% annually in this time. The overall prevalence of patients increased from 156 pmp in 1999 to 275 pmp in 2006. The main cause of end-stage renal disease was diabetes mellitus. Main causes of death on dialysis were cardiovascular disease (43.7%) and infectious disease (22.8%). Ninety percent of the organs were retrieved from cadavers. The cadaveric donation rate was 10 pmp. Cuba shares economic limitations with its neighbors but is one of the emerging world's least socially stratified countries, with a universal, free public healthcare system emphasizing primary health care and prevention in nephrology. (*Ethn Dis.* 2009; 19[Suppl 1]:S1-10-S1-12)

Key Words: End-stage Renal Disease, Incidence, Prevalence, Resources, Dialysis

INTRODUCTION

End-stage renal disease (ESRD) represents a serious public health problem throughout the world.¹ The fact that ESRD is a phased process indicates that prevention should be applied in all phases, beginning with healthy people and those who are considered to be at risk.² Cuba, with a population of 11.2 million, has an ever-increasing population of patients with ESRD requiring renal replacement therapy (RRT). To assist in measuring and managing this problem, the Cuban Dialysis and Transplant Registry was established by charter in 1982.^{3,4}

The Cuban national program provides specific guidance for action in 3 tiers. Primary prevention, carried out by family physicians, is intended for the healthy and at-risk populations. Secondary prevention, carried out by clinical nephrology services, is intended for patients suffering from chronic renal disease and looks to delay progression of their illness and to avoid complications. Tertiary prevention, carried out by RRT services, is directed to the treatment and social rehabilitation of ESRD patients.⁵ In this study, we analyze data from the 2006 annual dialysis and transplantation basic statistics.

RESOURCES

The National Institute of Nephrology is the leading referral center and has coordinated the nephrology specialty since its foundation in 1966. In Cuba there are 47 nephrology centers (9 of which provide kidney transplant services) and 5 laboratories with human leukocyte antigen tissue typing capability. To complement this structure, there are 50 hospitals that constitute the national network for the supply of cadaveric organs.

Two hundred sixteen nephrologists serving adults and 65 pediatric nephrol-

ogists form the human resources, which are divided into provincial and municipal services. The greatest strength of the nephrology specialty in Cuba lies in its relationship with family doctors, who are dedicated to primary care and are distributed throughout the country in 444 health areas that cover 100% of the population.

The Cuban pharmaceutical industry supplies the main drugs and dialysis solutions used in the nephrology program. Orthoclone OKT3 has been available since 1989. Other monoclonal antibodies have been used in renal transplantation since 1989. Vaccination against hepatitis B virus has been used since 1992 and recombinant erythropoietin since 1998. All of these agents are available to the whole population.

THE CUBAN KIDNEY REGISTRY

From the beginning, a culture of working closely together has characterized the activities of Cuban nephrologists both in matters of training new specialists and in setting up a network of transplant centers beyond Havana. For example, this approach helped to provide an interchange of organs across the network based on tissue matching after the first such procedure in 1976.

Drawing on this culture of cooperation, beginning in 1994, the Cuban Kidney Registry has collected statistical data on dialysis treatment and kidney transplantation, including prevalence and mortality data for patients on dialysis, as well as graft and patient-survival rates after renal transplantation.

In January 2003, the required information to update data for the Cuban Kidney Registry was redesigned in a more complete form, after discussion of the proposed indicators within the

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National Nephrology Group. The new data-collection form was finalized at a meeting with nephrologists and managers from the Cuban Ministry of Public Health. The indicators and variables to be studied were defined. Also determined was an organizational structure for data collection and transmission and a system outlining the flow of information through the structure, as well as a means of data transmission (email).

DATA COLLECTION, HANDLING, AND TRANSFER

On the 1st and 10th of each month, details of the structure, process, and results are entered into an electronic form. Data are collected and transcribed electronically. Each service has its primary registration and database for all hospitals to conduct local and regional analyses at the completion of the compilation process.

Data are validated immediately by reviewing the update form for that month and the previous month to correct errors, duplications, inconsistencies, and unexpected variations. These situations, should they arise, are discussed with the chief of service until the data have been cleaned and are considered complete, precise, and ready to be entered into the database.

In accordance with a predefined strategy, the final report is sent to the program underwriter, to the central government, the Ministry of Public Health, and most importantly to the health directors of each region (province and municipality) and also to the nephrology services. In recent years, regional services have also undertaken their own qualitative analyses. Access to RRT is universal.

RESULTS AND DISCUSSION

The incidence of new patients on dialysis in Cuba increased from 71 per million population (pmp) in 2000 to 98

pmp in 2006. There has been a sustained increase in the prevalence of patients on dialysis programs each year. In 2000, 100 pmp; in 2001, 115 pmp; in 2002, 119 pmp; in 2003, 134 pmp; in 2004, 149 pmp; in 2005, 174 pmp; and in 2006, 194 pmp. This corresponds with an annual increase of 15.1%, 11.5%, 10.3%, 11.2%, 16.7%, and 11.5%, respectively.

This observational study reveals that incidence and prevalence of patients on RRT in Cuba is only at a moderate level.⁸⁻¹¹ Of all patients entering the program, 43.5% are aged >60 years. This equates to a rate of 298.7 pmp, a figure that is close to that found in the developed world. This may well have catastrophic implications for renal programs in Cuba. The proportion of patients considered pediatric (aged <18 years) is low.

The incidence of primary renal disease is 23% for diabetes mellitus, 23% for vascular nephropathy, and 14% for glomerulopathy. Graft failure is the sixth most frequent reason for entering a dialysis program (3.3%).

Our study has brought to light the alarming rate of renal failure found in older and diabetic patients, but it is the lowest of all published registries.^{8,10} As of December 31, 2006, arteriovenous fistulas were the primary mode of vascular access (used for 82% of the prevalent patients). Cuban recombinant human erythropoietin (in use since 1998) is available for all patients on dialysis; it is both safe and efficacious. More than 72.7% of all patients as of December 31, 2006, had hematocrit >30% or hemoglobin >100 g/dL. No patients had contracted pure red cell aplasia due to anti-erythropoietin antibodies.^{6,7}

More than 99% of patients dialyze 3 times per week, with a calculated dialysis dose of 65% or greater ($Kt/V > 1.2$) for 100%. Ninety percent of all patients dialyze with polysulfona low-flux. Cuba has low renal transplant activity, with a rate of 10.3 transplants pmp, and 95.2 patients pmp had a functioning graft in 2006. This rate is among the lowest

reported in the literature.^{8,10} Ninety percent of the organs came from cadavers.

TREATMENT MODALITY

Annual prevalence by treatment modality showed a proportional increase in the number of patients on hemodialysis, while the number of patients on peritoneal dialysis and patients with a functioning graft remained stable. It is noteworthy that 29% of our RRT patients had a functioning renal graft, while hemodialysis and peritoneal dialysis modalities represented 67.5% and 3.1%, respectively, of prevalent patients as of December 31, 2006. The prevalence of RRT patients increased from 156 pmp in 1999 to 275 pmp in 2006. This increase was most evident in hemodialysis patients. Our results show lower dialysis rates than those of the United States, Japan, Europe, and Latin America; however, the causes of death in patients on dialysis is similar to other reports.⁸⁻¹¹

Treatment of kidney disease patients with cardiovascular complications is expensive to patients, their families, and society. The budget requirements for distressed patients with ESRD are high, and there are clearly many disparities recognized throughout the world.^{12,13} Maintenance dialysis poses a heavy social and financial cost on those who require it. The ongoing costs of this procedure are high and decrease the prevalence of RRT in Cuba.

CONCLUSIONS

The Cuban program for early detection, prevention of progression, and treatment of chronic kidney disease exists with the support of the government. The national registry of dialysis patients has gathered and published statistical data about RRT since 1994.

The prevalence of RRT has increased in the last years but not yet to

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the level of many other countries that have published similar data. Diabetes has become the leading cause of ESRD, followed by hypertensive nephropathy. On average, incident patients are older and have more co-morbidities. Cardiovascular disease remains the main cause of death on dialysis.

The Urban Population Health Initiative forms the action plan for the next few years until 2015. In that period, our program of chronic kidney disease, hemodialysis, and kidney transplantation is one of the priorities. Our goal will be to achieve total treatment of all patients with ESRD by 2015, and by performing 50 transplants pmp to provide transplantation for all for whom it is suitable.

Generations of Cuban nephrologists have had to deal with all the problems of a young specialty, including the difficult responsibility of selecting patients for the dialysis program, unsatisfactory results, as well as a lack of understanding by patients, which has led some of them to refuse treatment. Additionally, we have had to face up to

our mistakes and learn to live with our own frustrations, while providing better assistance to our patients, often in a critical clinical state, teaching our staff, and developing our skills.

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