

Chronic Kidney Failure in Nicaragua

We will start with some basic premises that give us an idea about the size of the problem caused by this disease anywhere in the world, particularly in Nicaragua.

First: Current estimates indicate that every year 400 people out of every million inhabitants show some **NEPHROPATHY**, either **PRIMARY** (infectious autoimmune glomerulonephritis, tubulointerstitial damage, whether hereditary, congenital, toxic, etc.) or **SECONDARY** (diabetic, lupic, amyloidosis, angiosclerotic, lithiasic, metabolic and other nephropathies). Of these 400 per million inhabitants, some 20% end up developing **CHRONIC KIDNEY FAILURE**.

According to INEC, Nicaragua has a population of approximately 5,300,000. Thus it is expected that 2,120 people will suffer each year some kind of nephropathy and of these 424 will develop CHRONIC KIDNEY FAILURE, requiring continuous medical treatment, dialysis procedures and kidney transplants.

In 1975, the cost of HEMODIALYSIS provision was \$1,907.70 per month, and a kidney transplant in such countries as Costa Rica, Cuba, and Venezuela costs around forty thousand dollars, in addition to \$494.70 per month in post-transplant maintenance therapy. Imagine the huge cost involved in the treatment of these 424 cases that are expected each year in our country.

Second: Based on the foregoing, M. R. Kral stated that "chronic renal diseases and their treatment could represent a huge financial, emotional, and social burden capable of destroying patients, their families and the state itself.

The most important aspect of this disease is that Chronic Kidney Failure (CKF) is a public health issue that is becoming more evident as new therapeutic methods provide uremic patients with longer and better survival rates, which in turn is increasingly exceeding any established or planned physical capacity for providing care to these patients.

All of the above statements, however, do not justify the fact that the Nicaraguan state has never established specific programs to manage these patients.

NEPHROLOGISTS: The first graduated nephrologist came to Nicaragua in 1972. Prior to his arrival, patients with acute chronic kidney failure were automatically classified as unrecoverable cases in both Leon and Managua, where the largest hospitals, San Vicente and El Retiro, respectively, were located. In addition to a diuretic-based treatment and a diet that was never followed, these patients

were marginalized and seen as a burden on hospital staff, their own families and society, and were doomed to hopelessly die from UREMIA complications.

After the first nephrologist arrived, patients with acute kidney failure and some with chronic kidney failure began to be managed at the El Retiro Hospital with rigid-catheter peritoneal dialysis and one patient received hemodialysis therapy.

There was earthquake that same year and all the plans to have a highly technified nephrology service fell through.

Seven years passed after the arrival of the first nephrologist to Nicaragua before the arrival of the second nephrologist, a pediatrician nephrologist who first held administrative positions and later began practicing in "La Mascota" hospital, where he founded the pediatric nephrology service. The third nephrologist came in 1981 and was assigned to the then Bertha Calderon Hospital (formerly Hospital Occidental), where he managed and strengthened the nascent adult nephrology department and implemented intermittent peritoneal dialysis (IPD) with rigid catheters, continuous ambulatory peritoneal dialysis (CAPD) with Tenckhoff-catheters and hemodialysis with two TRAVENOL machines and a large number of COIL type filters that were kept in the hospital warehouse and had been purchased by the first nephrologist that came to the country.

Subsequently, ten more nephrologists have come to the country, for a total of 13, three of whom are pediatrician nephrologists and 10 are adult nephrologists. One nephrologist resides in Masaya, another in Leon and the rest in Managua.

During the "golden era" of nephrology in Nicaragua, chronic patients were offered peritoneal dialysis and hemodialysis, but a kidney transplant was never an option, despite all efforts that were undertaken to convince the different governments about the need to start such a program for properly managing this type of patients. The intermittent dialysis program could not be implemented for lack of essential replacement materials, such as solutions, catheters, drain guides, etc., and patients in this program required a dialysis every 8 to 10 days before their condition deteriorated. We were able to dialyze them every 3 weeks at the most until their clinical conditions became extremely serious with all the signs of UREMIA and what we call PERITONEAL DIALYSIS UPON REQUEST (PDR), a term coined in Nicaragua since this kind of program does not exist anywhere else in the world as a maintenance therapy for chronic kidney failure patients.

The nephrology department of the Bertha Calderon Hospital was moved to the Lenin Fonseca Hospital in 1982-1983 when the former was transformed into a women's hospital. It continued to provide the same services under the pompous

name of NATIONAL REFERENCE CENTER FOR NEPHROLOGY, which was the only support from MINSAs. Hemodialysis with TRAVENOL machines ended due to the deterioration of the machines and lack of filters. Some 3 years later, one machine was built with two German machines and was used specifically for treating people poisoned with GRAMOXONE, but it also broke down, and thus MINSAs's hemodialysis program came to an end. During the Chamorro administration, a U.S. resident physician brought a "trash" cargo of four broken down hemodialysis machines, without filters, which were never used and are probably still in the warehouses of the Lenin Fonseca Hospital.

Currently in Nicaragua, neither the MINISTRY OF HEALTH (MINSAs) nor the NICARAGUAN SOCIAL SECURITY INSTITUTE (INSS) have programs in place for properly managing CKF patients. INSS even considers it as an out-of-coverage disease, although acute cases are covered, as long as they do not require dialysis. However, 3 kidney transplants have been performed at the private Salud Integral Hospital, two in February 2000 and one in December of that same year. All of them were financed by INSS, albeit outside any specific program. These transplants were made in collaboration with a Costa Rican physician and a Cuban physician and with support from the Central American Nephrology Society. This same center also has approximately 30-35 patients in a hemodialysis program financed by INSS, including both insured and uninsured patients, without any defined or known program. HEODRA has a hemodialysis machine that is used in isolated cases. The Department of Nephrology of the Lenin Fonseca Hospital provides the aforementioned PERITONEAL DIALYSIS UPON REQUEST (PDR) only to terminally-ill patients.

ETIOLOGY AND ORIGIN OF CHRONIC KIDNEY FAILURE

Up until 1983, no study had been carried out in Nicaragua that could guide us to causes of CKF in our patients. In 1983, the first study was conducted from which data on two parameters was extracted to guide us to the origin of this disease: the cause determined by nephrologists and the place of origin of the patients. In this first study, a total of 142 advanced CKF patients were identified, of which 65 (46.7%) were classified as chronic glomerulonephritis, 24 (16.9%) as tubulointerstitial nephritis, and 55 (37.3%) without etiological diagnosis.

Of the 65 cases classified as chronic glomerulonephritis, 59 (41.5%) were labeled as PRIMARY or IDIOPATHIC (no apparent cause was found) and 6 (4.22%) as SECONDARY (5 from diabetes and 1 from systemic lupus erythematosus). Of the 24 tubulointerstitial nephritis cases, 22 (15.4%) were attributed to chronic pyelonephritis and 2 (1.4%) to renal tuberculosis. It is worth mentioning that although some 50 kidney biopsies were performed, classification criteria were eminently clinical given that the lack of some stains for light and immunofluorescence microscopy, which is mandatory in studying kidney tissues,

coupled with the lack of experience of the pathologists, rendered the reports insufficiently reliable. On the other hand, CKF patients almost always show up at the hospital when they already have clear signs of the uremic syndrome and need to be dialyzed, thus preventing further delving into the cause of their renal lesion.

Insofar as the place of origin, the study found that most patients came from five departments: Managua with 52 patients (36.6%), Leon with 21 patients (16.7%), Chinandega with 14 patients (9.8%), and Granada and Masaya with 9 patients each (6.33%), although patients came from practically all departments of the country.

Based on the above, the following can be concluded: 1. Chronic Kidney Failure is not exclusively prevalent in a specific department, it is prevalent throughout Nicaragua, and the departments with the largest number of patients have the highest population density. 2. As to the causes of the lesions, IMMUNOLOGICAL causes rank in first place, followed by secondary causes, such as DIABETIC NEPHROPATHY, which is currently the cause of 25% of all CKF cases, high blood pressure, and collagenopathies (systemic lupus erythematosus). In any case, with respect to the Ingenio San Antonio case, the EXTERNAL CAUSES of these renal lesions should be researched and the damage produced would be TUBULOINTERSTITIAL NEPHRITIS (TIN) and the following causes are mentioned in world literature: gold, cadmium, lead, lithium and mercury salts, pain killers, NSAIDs, chemotherapy drugs (cisplatin, nitrosurcas), immunotherapy drugs (cyclosporin, FX-506), penicillin, cephalosporin and cimetidine. However, no study mentions ANY PESTICIDES OR FERTILIZERS, which were widely and abundantly used for many years in the western part of the country, as the cause of TIN. The presence of heavy metals in the water in this zone should be investigated, as well as the presence of excessive calcium, as a cause of renal lithiasis, but malaria should also be considered, particularly its QUARTAN form that is endemic to Nicaragua and produces severe renal lesions. Hepatitis B and syphilis should also be researched.

A second study conducted in 1986 reported 113 cases during the 9-month study period. Of these, 63 (55.7%) were classified as chronic glomerulonephritis (of immune origin), 14 (12.3%) as diabetic nephropathy, 13 (11.5%) as nephroangiosclerosis (high blood pressure), 10 (8.8%) as chronic (infectious) pyelonephritis, 10 (8.8%) as (mechanical + infectious) obstructive uropathy, 2 (1.7%) as (hereditary) polycystic kidneys, and 1 (0.88%) as (immunological) lupic nephropathy.

Insofar as the place of origin, Managua always ranked in first place with 43 patients (38.0%), followed by Leon with 31 patients (27.4%), Chinandega always ranked in third place with 16 patients (14.1%), but Boaco displaced Granada

and Masaya and ranked in fourth place with 6 patients (5.5%). I still think the departments with the highest number of patients have the highest population density.

In 2000, the department of nephrology of the Lenin Fonseca Hospital found that Managua ranked first in the number of patients with 245 cases (no new cases), Masaya with 14, Chinandega with 13, Granada with 11, Carazo and Matagalpa with 9 each, and Leon with only 3. Patients from all departments were always found.

After these last two researches, the conclusions are the same: a. the departments with the highest number of patients are those with the highest population density, b. chronic kidney failure is prevalent throughout Nicaragua, c. there are no scientific bases to affirm that pesticides and/or fertilizers are the cause of CKF in the western part of the country, d. more common causes in our environment should be investigated as the cause of CKF: heavy metals, malaria, syphilis, hepatitis B, abuse of pain killers and NSAIDs, etc., e. the primary causes of CKF continue to be those having an immunological nature, and the secondary causes are currently diabetes, hypertension, and bacterial infections, f. MINSA should establish comprehensive management programs for uninsured patients and INSS should do the same for insured patients.

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