

Report of the Brazilian Chronic Dialysis Census 2012

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ABSTRACT

Introduction: National chronic dialysis data are fundamental for treatment planning. **Objective:** To report data of the annual survey of the Brazilian Society of Nephrology about chronic kidney disease patients on dialysis in July 2012. **Methods:** A survey based on data of dialysis units from the whole country. The data collection was performed by using a questionnaire filled out on-line by the dialysis units in Brazil. **Results:** 255 (31.9%) of the dialysis units in the country answered the questionnaire. In July 2012, the total estimated number of patients on dialysis in the country was 97,586. The estimated prevalence and incidence rates of chronic kidney disease on maintenance dialysis were 503 and 177 patients per million population, respectively. The estimated number of new patients starting dialysis in 2012 was 34,366. The annual gross mortality rate was 18.8%. For prevalent patients, 31.9% were aged 65 years or older, 91.6% were on hemodialysis and 8.4% on peritoneal dialysis, 30,447 (31.2%) were on a waiting list of renal transplant, 28.5% were diabetics, 36.6% had serum phosphorus > 5.5 mg/dl and 34.4% hemoglobin < 11 g/dl. A venous catheter was the vascular access for 14.5% of the hemodialysis patients. **Conclusion:** The prevalence and incidence rates of chronic kidney disease patients on dialysis increased, while the mortality rate tended to decrease compared with 2011. The indicators of the quality of maintenance dialysis remained stable with a trend towards decrease in levels of anemia. The data highlight the importance of the census to guide chronic dialysis therapy.

Keywords: Brazil, census data, chronic, dialysis, epidemiology, kidney failure.

INTRODUCTION

The Brazilian Society of Nephrology (SBN) has been leading a national census on patients with chronic kidney disease undergoing dialysis for more than 10 years, from information provided by dialysis facilities registered in the entity. This information has provided knowledge on several epidemiological aspects of patients on chronic dialysis treatment in the country and their trends over the years; and it has provided subsidies for dialogues with the government and other providers of such treatment to plan the care for these patients. This important activity of the Brazilian Society of Nephrology has been carried out with the voluntary cooperation of dialysis centers across the country. In this report, we present data concerning the dialysis patients' situation on July 1, 2012, as well as some comparisons with previous years.

METHODS

During the second half of 2012, a survey was carried out on patients with chronic kidney disease on outpatient dialysis in all units in the country registered at SBN. From August to October of 2012, a record with the issues of this study became available on the SBN website on the Internet and all dialysis units in the country were requested to fill out the questionnaire

and submit their data online to the SBN secretary. Every month, the units which had not yet submitted their data were requested to fill out the form until the established due date (October 30, 2012). When necessary, data was obtained or confirmed by telephone interview through the SBN secretariat responsible for the dialysis unit. Questions on most sociodemographical, clinical, laboratory and treatment aspects referred to dialysis patients on July 1, 2012. Mortality data and the entry of new dialysis patients involved the month of July 2012 and estimates were made for the entire year.

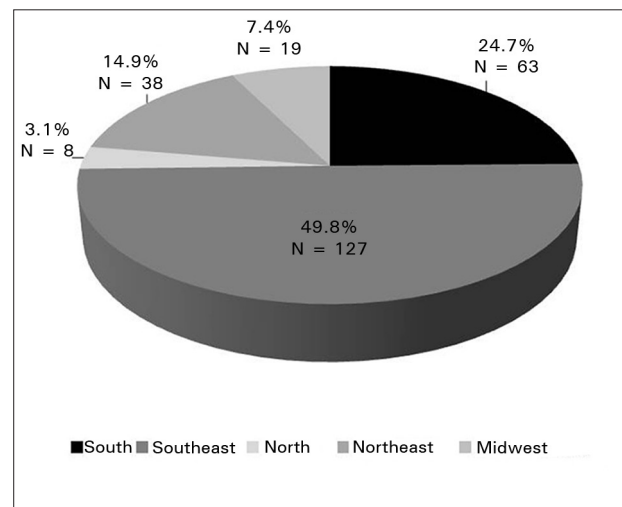
From the 696 dialysis units registered at SBN in July 2012, 651 had active program for chronic dialysis, and 255 (39.1%) of these completed the questionnaire and had their data analyzed. The data was computed from 38,198 patients in 255 participating dialysis units. The data sent by the centers was collected in groups rather than individually from each patient, and should therefore be interpreted as representing averages of patient characteristics and treatment practices prevalent in each dialysis unit. National data was estimated taking into account the numbers expected from the centers that did not respond to the survey, as per their regional location. The units that did not respond to the census were assigned the average number of patients expected for that region and their total computed in estimates. Population estimates from Brazil and from every region of the country used in the calculation of prevalence and incidence were made from updated IBGE estimates for July 2012. Using the pooled data we estimated the percentage of patients outside the recommended target indexes,^{1,2} for dialysis dose (for Kt/V or urea reduction ratio) and serum concentrations of albumin, phosphorus, PTH and hemoglobin.

RESULTS

The total number of active units increased slightly in 2012 compared to 2011 (651 and 643, respectively). Figure 1 shows the distribution of active units that responded to the census by

region. The proportion of units that responded in relation to the total number of active ones was similar between the various regions of the country, mostly located in the Southeast, followed by the South and Northeast. The number of patients who responded at the 255 units was 38,198. From the total of these patients, 83.9% had their treatments paid by the Public Health Care System (SUS) and 16.1% by private health insurance.

Figure 1. Distribution of the dialysis units that responded to the census (n = 255) by region, 2012 census.



The estimated total number of dialysis patients in the country on July 1st, 2012 was 97,586. The number has increased gradually over the years: 42,695 in the year 2000; 92,091 in 2010 and 91,314 in 2011. There was an annual increase of 3% per year compared to 2010. More than half of these patients were in the Southeast. The prevalence rate of dialysis in 2012 was 503 patients per million of the population (pmp), varying by region among 291 patients pmp in the North to 630 patients pmp in the Midwest region (Figure 2). The overall increase in the prevalence rate was almost 6% when compared to 2011, when this rate was 475/pmp. The estimated number of patients who started treatment in 2012 in Brazil was 34,366, corresponding to an incidence rate of 177 patients pmp (Figure 3). Over 50% of the patients (n = 18,072) initiated treatment in the Southeast region; 6,051 patients started dialysis in the Northeast; 5,963 in the South region; 2,733

in the Midwest region and 1,480 in the North. The annual incidence rate of treatment ranged from 91 pmp in the Northern region to 222 pmp in the Southeast (Figure 3). These estimates are substantially higher than those observed in 2011, when 26,680 new patients started treatment (149/ pmp).³

Figure 2. Estimated prevalence of patients on dialysis in Brazil, per region, 2012 census.

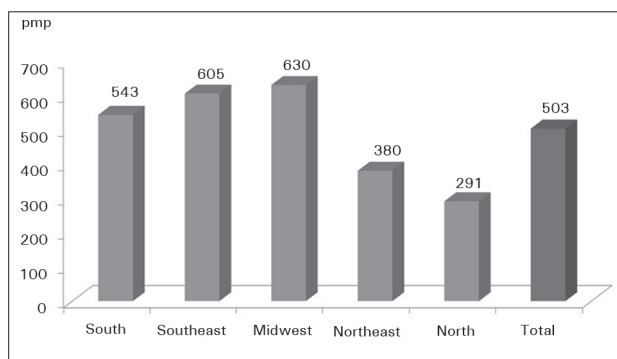
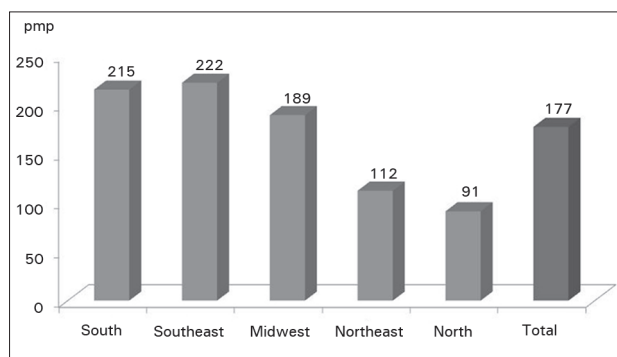


Figure 3. Estimated incidence of patients on dialysis in Brazil, by region, census 2012.



The percentage of dialysis patients with 12 years of age or less; between 13 and 18; 19 to 64 years; 65-80 years or > 80 years were 0.3%, 4.2%, 63.6%, 27.7% and 4.2%, respectively. What stands out is the percentage of children which increased when compared to 2011 (1.6%), while the percentage of the elderly did not change (4.3% in 2011). Fifty-eight percent of patients were males.

In July 2012, 91.6% of the patients on chronic dialysis were being treated by hemodialysis and 8.4% were on peritoneal dialysis, and of these, automated peritoneal dialysis was the predominant treatment mode. Table 1 shows the

distribution of patients according to the type of dialysis and payment source, a higher percentage of patients paid by health insurance were on daily hemodialysis and peritoneal dialysis, particularly the APD in relation to those reimbursed by the SUS. In the Public Health Care System, 7.9% of the patients were on peritoneal dialysis compared to 11.2% - who had their treatment paid by private health insurance companies.

TABLE 1 PATIENT DISTRIBUTION ACCORDING TO THE TYPE OF DIALYSIS AND PAYING ENTITY, CENSUS 2012

Mode	SUS N (%)	Not SUS N (%)	Total N (%)
HD conventional	29,459 (91.9)	5,285 (85.9)	34,744 (91.0)
HD daily (> 4x/sem.)	62 (0.2)	174 (2.8)	236 (0.6)
CAPD	1,169 (3.6)	208 (3.4)	1,377 (3.6)
APD	1,333 (4.2)	482 (7.8)	1,815 (4.8)
IPD	25 (0.1)	1 (0.0)	26 (0.1)
Total	32,048 (100)	6,150 (100)	38,198 (100)

Regarding the diagnosis of primary renal disease, the most common were associated with hypertension (34%) and diabetes (29%), followed by chronic glomerulonephritis (13%) and polycystic kidneys (4%), other diagnoses were made in 11% and this was not defined in 10% of the cases.

The prevalence of positive serology for hepatitis B and C virus in patients maintained on chronic dialysis in Brazil was 4.6% and 1.0%, respectively, and the rate for HIV was 0.8%. In 2011, the prevalence of positive serology for hepatitis C, B and HIV was 5.5%, 1.1% and 0.8%, respectively.

The estimated percentage of patients in hemodialysis with central venous catheter (temporary or permanent) was 14.5% and in use of vascular graft (graft) was 4.1%. In the evaluated sample (n = 38,198) in July 2012, the monthly rate of hospitalization was 5.7%. Concerning laboratory indices recommended for dialysis patients,^{1,2} Figure 4 shows that, among patients on hemodialysis, 21% had Kt/V < 1.2

or urea reduction ratio < 65%; 15% of patients had serum albumin < 3.5 g/dL; 37% had serum phosphorus > 5.5 mg/dL; PTH 29% greater 300 pg/ml; and 21% had values above 600 pg/ml, and 17% with less than 100 pg/ml. Thirty-four percent had hemoglobin < 11 g/dl and 25% had values lower than 10 mg/dL.

Figure 4. Percentage of patients with tests not showing compliance with the recommended indices of 2010-12, census 2012.

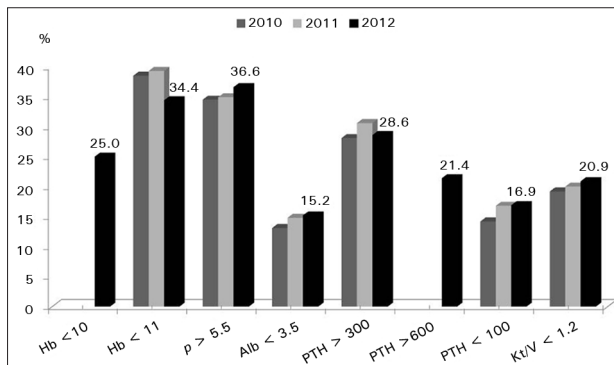
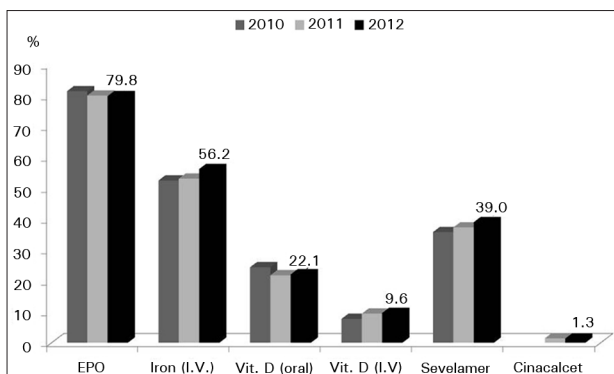


Figure 5 shows the percentage of use of some selected medications in these patients: 80% were using erythropoietin; 56% intravenous iron; 32% vitamin D; 39% sevelamer, and only 1.3% used cinacalcet.

Figure 5. Percentage of patients using the selected medication in 2010-12, census 2012.



The estimated number of patients enrolled on the waiting list for transplantation in July 2012 was 30,447, equivalent to 31.2%.

The estimated number of deaths in 2012 was 18,333, corresponding to a gross mortality rate (with the dialysis population on July 1 in the denominator) of 18.8% during the year.

DISCUSSION

The results of this report include the participation of 39% of active dialysis centers in the country. Although lower than in previous years (55% in 2011),³ this percentage has a substantial representation in the national territory and, although the sample of centers that responded was voluntary, it boasts a percentage distribution similar to the overall distribution of dialysis centers for the region in the country, which leads us to make inferences about the national generalization of the results. The best way to interpret our data is to observe trends over previous years. Estimates indicate an increase in the number of new patients (incidence) and the number of patients on dialysis (prevalence) in 2012 compared to recent years. For instance, the number of patients on treatment has increased by 3% per year since 2010. Our annual estimates should be interpreted with caution due to the variable response rate from the centers and the way of answering the questions, which require further validation. We have consistently reported variability in rates of prevalence and incidence by region of the country. This year in particular, we observed a higher prevalence rate in the Midwest region, unlike last year, which indicated a higher rate in the Southeast. This year's estimate should be interpreted with caution, because the Midwest was one that showed a lower response rate (30%), which may cause bias in the estimates. There has been an increase on the prevalence rate reported in the United States and other developed countries in Europe and Asia, although the incidence of patients on renal replacement therapy has increased little or tended to stabilization.⁴ In USA for instance, the prevalence rate has increased around 2% in the last 8 years.⁴

The overall prevalence rate of dialysis (503/pmp) should be added to that of patients with functioning kidney graft (about 200/pmp) to obtain the actual rate of renal replacement therapy, which should be around 700/pmp. This latter rate is still lower than that of countries such as Chile (1.100/pmp), Argentina (800/pmp) and of some

developed countries in Europe that are around 900-1.000/pmp, and also the U.S., 1870/pmp in 2010.⁴ However, as there are large regional variations in Brazil, the rate of the Southeast and South regions, for instance, must be very close to that of developed countries. Approximately 34,000 patients (177/pmp) initiated chronic dialysis treatment in 2012. Similarly to the prevalence rates, we also observed large regional variability in incidence rates. The actual rate of incident patients must be achieved by adding the recipients of pre-emptive transplantation, and this seems similar to that observed in many European countries, although still way behind that of the United States (369/pmp) and Japan (288/pmp).⁴

In 2012 we found a substantially higher percentage of children and adolescents on dialysis compared to 2011 (4.5% *vs.* 1.6%, respectively), which should be confirmed in other studies. The percentage of 91.6% of patients on maintenance hemodialysis had a slight tendency to increase compared to that observed in previous censuses. Noteworthy, is the higher percentage of patients on APD and on daily hemodialysis among those subsidized by healthcare insurance plans, although the latter still represents less than 1% of all dialysis patients. The percentage of patients using venous catheter as access for hemodialysis remained constant (14.5%), and for the first time we estimated the percentage of patients in hemodialysis using vascular grafts, which was 4.1%. Hypertensive nephropathy is the principal underlying disease, followed by diabetes. A positive serology for hepatitis C continues decreasing annually; hepatitis B and HIV are stable. The percentage of patients with tests that did not comply with the international guidelines^{1,2} was generally similar in all indicators measured *vis-à-vis* the year 2011. However, the percentage of patients with hemoglobin < 11 g/dl decreased from 39% in 2011 to 34% in 2012. In that year, we found that 25% of patients had hemoglobin levels below 10 g/dl which corresponds to the most recently recommended target value. The percentage number of

patients using erythropoietin and intravenous iron has also kept high. The high percentage of patients with anemia and high levels of phosphorus and PTH compared to those recommended in the guidelines has also been observed in other developed countries in Europe, as well as in the United States and Japan.^{5,6} The lack of adaptation observed in a significant percentage of patients concerning indicators of mineral metabolism disorders (phosphorus and PTH) occur despite the high number of patients on sevelamer (39%) and vitamin D (32%), apart from showing the recent onset of cinacalcet use in our country. The gross mortality rate showed a slight decrease compared to 2011 (18.8% *vs.* 19.9%), which should be seen as a positive indicator of treatment efficacy. In the last year, compared to 2011, the percentage of patients with diabetic nephropathy and elderly subjects was stable, revealing that there was no increased risk of overall mortality due to these factors. The mortality rate observed in Brazil remains below what has been reported for the U.S. population on dialysis.⁴

The generalizations in this study should be interpreted with caution due to the percentage of centers that responded to the survey, the data collection procedure on groups of patients per center and the lack of validation *vis-à-vis* the responses sent.

CONCLUSION

The SBN census is an initiative of fundamental importance for understanding dialysis treatment in our country. This report provides information for the improvement of care for patients with chronic end-stage kidney disease and the national planning policy regarding chronic dialysis treatment in Brazil.

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