



Quality of Life: comparison between patients on automated peritoneal dialysis and patients on hemodialysis*

Qualidade de Vida: comparação entre diálise peritoneal automatizada e hemodiálise

Calidad de vida: comparación entre diálisis peritoneal automatizada y hemodiálisis

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ABSTRACT

Objective: To evaluate the health-related quality of life in patients from a satellite dialysis center in São Paulo city undergoing Automated Peritoneal Dialysis (APD) or Hemodialysis. **Methods:** This cross-sectional descriptive study included 101 patients with ages ranging from 18 to 75 years-old, who were in dialysis treatment over 90 days and able to understand the items of the SF-36 questionnaire in Portuguese. **Results:** The Hemodialysis group (n=79) had been in dialysis treatment longer (p=0.001) and had higher serum albumin level (p<0.001) than the APD group (n=22). The SF-36 scores of the two groups were similar in all dimensions, except for the physical functioning dimension, on which the hemodialysis group had higher scores than the APD group (p=0.03). There were no statistically significant interactions between the SF-36 score and the other variables of the study. **Conclusion:** There were no differences in quality of life between patients on APD and patients on hemodialysis, except for the physical functioning dimension.

Keywords: Quality of life; Dialysis; Peritoneal dialysis; Hemodialysis

RESUMO

Objetivo: Avaliar a Qualidade de Vida relacionada à saúde em pacientes submetidos à Diálise Peritoneal Automatizada (DPA) e Hemodiálise em um centro de diálise satélite no Município de São Paulo. **Métodos:** Este estudo observacional transversal, incluiu 101 pacientes com idade entre 18-75 anos, em terapia há mais de 90 dias e que compreenderam o questionário. **Resultados:** O grupo em Hemodiálise (n=79) estava em terapia há mais tempo (p=0.001) e tinha albumina sérica maior (p<0.001) comparado ao grupo em DPA (n=22). Os escores do SF-36 foram semelhantes em várias dimensões, exceto pelo escore de Aspectos Físicos que foi maior nos pacientes em Hemodiálise (p=0.03). Não houveram interações significativas entre SF-36 e as demais variáveis que explicassem esta diferença. **Conclusão:** A Qualidade de Vida foi semelhante entre as modalidades, porém o escore de Aspectos Físicos foi menor para pacientes em Diálise Peritoneal Automatizada.

Descritores: Qualidade de vida; Diálise; Diálise peritoneal; Hemodiálise

RESUMEN

Objetivo: Evaluar la Calidad de Vida relacionada a la salud de pacientes sometidos a Diálisis Peritoneal Automatizada (DPA) y Hemodiálisis en un centro de diálisis del Municipio de Sao Paulo. **Métodos:** Este estudio observacional transversal, incluyó a 101 pacientes con edades comprendidas entre los 18 y 75 años, que se encontraban en terapia hace más de 90 días y que comprendieran el cuestionario. **Resultados:** El grupo en Hemodiálisis (n=79) estaba en terapia hace más de un tiempo (p=0.001) y tenía albúmina sérica mayor (p<0.001) comparado al grupo en DPA (n=22). Los escores del SF-36 fueron semejantes en varias dimensiones, excepto para el escore de Aspectos Físicos que fue mayor en los pacientes en Hemodiálisis (p=0.03). No hubo interacciones significativas entre SF-36 y las demás variables que explicaran esta diferencia. **Conclusión:** La calidad de Vida fue semejante entre las modalidades, no obstante el escore de Aspectos Físicos fue menor para pacientes en Diálisis Peritoneal Automatizada.

Descriptores: Calidad de vida; Diálisis; Diálisis peritoneal; Hemodiálisis

* Study developed in a single dialysis center in the city of São Paulo (SP), Brazil.

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INTRODUCTION

In the last decades advances in dialysis procedures and new guidelines to treat the chronic renal failure patients have improved their treatment and prolonged their lives. At the same time the concept of “health-related quality of life” (HRQoL) strengthened as a new goal to be achieved.

The current dialysis guidelines enforce treatments to achieve similar outcomes in the long run, independently of the choice of dialysis treatment. Therefore, HRQoL turns out to be an important issue when deciding for a treatment modality.

Questionnaires were developed in order to quantify and compare HRQoL among populations and treatments⁽¹⁻²⁾. The automated peritoneal dialysis (APD) is a recent dialysis modality in comparison with hemodialysis (HD) or continuous ambulatory peritoneal dialysis (CAPD), but it has been considered a more beneficial renal replacement modality⁽³⁾. Only a few studies addressed the issue of HRQoL in APD patients compared to other kinds of dialysis treatment⁽⁴⁻⁶⁾. It is our perception that HRQoL is the same in APD and in HD patients although the day-time savings in APD treatment might allow APD patients to enroll in activities that could improve their HRQoL.

The purpose of this study is to evaluate self-assessed HRQoL in patients who have been treated by APD and HD in a single dialysis center in the city of São Paulo.

METHODS

This is an observational cross-sectional study, carried out in a single dialysis center in the city of São Paulo, Brazil. The inclusion criteria were that all patients should be under these two kinds of dialysis (APD or HD) for more than 90 days, with ages ranging between 18 and 75 years on a pre-defined date to be enrolled and evaluated. The patients in CAPD treatment were excluded because the group was too reduced. This protocol was approved by the ethical committee in clinical research of the Hospital das Clínicas of the University of São Paulo School of Medicine (approval n° 931/03).

The Medical Outcomes Study Short Form 36-item Health Survey (SF-36) was used to evaluate HRQoL because it has been validated for the Portuguese language⁽²⁾ and has been used in chronic renal failure patients⁽⁷⁻⁸⁾.

The detailed description of SF-36 is described elsewhere⁽⁸⁾. To summarize, it covers three levels of evaluations: 36 individual items; eight dimensions: role-functioning physical (RP), physical functioning (PF), bodily pain (BP), general health perceptions (GH), vitality (VT), social functioning (SF), role-functioning emotional (RE) and mental health (MH); and the eight dimensions can be further grouped in a physical component summary

composed of the domains RP, PF, BP, GH, VT and a mental component summary composed of domains SF, RE, MH, GH, VT.

For each domain one score is obtained ranging from 0-100, being 100 the best HRQoL evaluation. The scores cannot be added up to obtain a grand total score because they evaluate different aspects of the HRQoL^(1-2, 8-11). However, the physical component summary and the mental component summary can be calculated by adding the different components of each summary; taking into account that the general health perception and vitality dimensions are added in both components.

The Daugirdas II “Kt/V” was used as a marker of dialysis adequacy. Adequacy for HD was defined as a Kt/V ≥ 1.3 and a weekly Kt/V ≥ 2.2 for APD.

Hemoglobin and serum albumin levels, collected in the month of the SF-36 evaluation, were used for the analysis. Hemoglobin level $< 10\text{g/dL}$ was defined as anemia. Serum albumin level $> 3.8\text{ g/dL}$ was considered adequate. Demographics and social data from the patients were collected from the electronic medical database, updated on the day of the SF-36 questionnaire application.

The month defined for the selection of patients for the study was December, 2003. In this period, 194 patients were being treated at our center: 131 in HD, 55 in APD and 8 in CAPD. 74 patients were excluded (eight on CAPD, six for age < 18 years, 21 for age > 75 years, 24 for time in therapy < 3 months and 15 unable to read or understand the questionnaire due to physical, mental, language or intellectual limitations). The remaining 120 patients, 92 in HD and 28 in APD, were considered apt to participate in this study.

After this primary selection and before starting the HRQoL questionnaire, two APD patients died and four declined to participate in the study. In the HD group, one patient moved to another city and 12 declined to participate. Therefore, the final study population comprised 101 patients, being 79 in HD and 22 in APD. All patients signed the approved informed consent.

Data are presented as mean \pm SD or percentage. Values of $p < 0.05$ were considered statistically significant. The software SPSS version 14.0 was used for statistical analysis. The one way ANOVA was used to compare continuous variables between groups, while proportions of categorical variables were compared with the chi-square test. Correlation between continuous variables was performed using Pearson’s correlation. Multivariable Linear Regression Model was used to explore the independent associations of covariates and their interactions with HRQoL category scores.

RESULTS

The social and demographics parameters of the APD

and HD patients who participated in the study are shown in Table 1. Groups were similar regarding the parameters, except for the frequency of having private health insurance that was higher in APD group.

Table 1 – Social and demographics features in the HD and APD patients treated in a single dialysis center in the city of São Paulo, December 2003

Social-demographics parameters	HD n=79	APD n=22	P value
Age (Mean \pm SD years)	47.5 \pm 14.8	52.2 \pm 15.4	0.21
Gender (male, %)	38 (48.1)	9 (40.9)	0.55
Skin color (%)			
white	47 (59.5)	15 (68)	
brown/black	29 (36.7)	4 (18)	0.09
yellow	3 (3.8)	3 (14)	
Stable partner (yes, %)	51 (64.6)	12 (54.5)	0.4
Educational level (%)			
Low	44 (55.7)	9 (40.9)	
Intermediate	22 (27.8)	5 (22.7)	0.33
High	13 (16.5)	8 (36.4)	
Employed (%)	20 (25.3)	6 (27.3)	0.85
Family Income (%)			
\leq 1 MW	4 (5.1)	-	
1-4 MW	38 (48.1)	7 (31.8)	0.18
$>$ 4 MW	37 (46.8)	15 (68.2)	
Private Health insurance (yes, %)	28 (35.4)	14 (63.6)	0.02

SD: standard deviation; APD: automated peritoneal dialysis; HD: hemodialysis; MW: minimum wage

Table 2 – Clinical features in the HD and APD patients treated in a single dialysis center in the city of São Paulo, December 2003

Clinical features	HD n=79	DPA n=22	P value
Time on therapy (Mean \pm SD days)	1062 \pm 748	1517 \pm 403	0.001
Primary renal disease (%)			
Glomerulonephritis	33 (41.8)	13 (59.1)	
Nephrosclerosis	23 (29.1)	4 (18.2)	
Diabetes Mellitus	16 (20.3)	3 (13.6)	0.53
TIN	3 (3.8)	2 (9.1)	
ADPKD	4 (5.0)	-	
Co-morbidities (%)			
Cardiovascular	17 (21.5)	9 (40.9)	0.06
Hypertension	37 (46.8)	6 (27.3)	0.14
Hepatitis C	11 (13.9)	5 (22.7)	0.33
Diabetes Mellitus	19 (24.1)	4 (18.2)	0.78
Body Mass Index $>$ 30%	8 (10.1)	2 (9.1)	1.0
Others	8 (10.1)	6 (27.3)	0.07
Severe/moderate HPTx	9 (11.4)	1 (4.5)	0.69
Anaemia			
Hemoglobin $<$ 10g/dL (%)	20 (25.3)	3 (13.6)	0.39
Kt/V adequate (%)			
HD \geq 1.3; DPA \geq 2.2	50 (63.3)	15 (68.2)	0.86
Serum albumin \leq 3.8 g/dL (%)	3 (3.8)	9 (40.9)	$<$ 0.001

SD: standard deviation APD: automated peritoneal dialysis; ADPKD autosomic dominant polycystic kidney disease; HD: hemodialysis; HPTx: secondary hyperparathyroidism; TIN: tubule-interstitial nephritis

Table 2 shows the clinical parameters of both HD and APD groups. HD patients were on dialysis for a longer period than APD patients ($p=0.001$). Also, more patients in the HD group had an albumin plasma level higher ($p < 0.001$) than the adequate level (> 3.8 g/dL). Consequently, mean serum albumin was higher in the HD group (4.25 ± 0.29 vs 3.77 ± 0.37 g/dL, $p < 0.001$).

Although not statistically significant, the percentage of the cardio-vascular co-morbidity in APD group was higher than in the HD (40.9% vs 21.5%). On the other hand, systemic arterial hypertension was more prevalent in HD patients (46.8% vs 27.3%).

Health-related Quality of Life

All enrolled patients answered the SF-36 questionnaire, no question was left unanswered and none of the patients required assistance to answer the questionnaire.

Table 3 shows the results of the scores regarding the domains of the SF-36 questionnaire using a model adjusted for variables with significant differences (time on therapy, private health insurance and serum albumin) as well as other variables, clinically relevant for the study (age, gender and stable partner).

Table 3 – SF-36 Scores for the Hemodialysis and Automated Peritoneal Dialysis patients treated in a single dialysis center in the city of São Paulo, December 2003

SF-36 dimensions	HD n=79	DPA n=22	P value
Role-functioning physical	61.4 \pm 23.4	55.7 \pm 29.6	0.97
Physical functioning	55.7 \pm 40.8	29.5 \pm 35.0	0.03
Bodily pain	52.2 \pm 26.9	62.3 \pm 22.4	0.08
General health perceptions	51.9 \pm 25.6	56.1 \pm 20.9	0.45
Vitality	58.9 \pm 22.5	55.6 \pm 23.4	0.40
Social functioning	76.1 \pm 23.0	64.7 \pm 26.6	0.13
Role-functioning emotional	67.1 \pm 40.8	62.1 \pm 42.8	0.22
Mental health	68.7 \pm 22.7	68.9 \pm 22.5	0.70
Physical Component Summary	56.3 \pm 19.6	51.8 \pm 18.8	0.64
Mental Component Summary	64.5 \pm 19.9	61.5 \pm 20.4	0.44

APD: Automated Peritoneal Dialysis; HD: hemodialysis;

There were no differences in seven out of the eight domains. However, the score of the Physical Functioning dimension was statistically lower in APD when compared to HD patients ($p=0.03$). The Bodily pain dimension was higher in APD patients, nevertheless, not reaching statistical significance.

The evaluation of the Physical Component Summary and Mental Component Summary did not show differences between the two dialysis modalities.

DISCUSSION

This study reports similar HRQoL scores between patients treated with APD compared to HD in most of the SF-36 domains. However, the APD patients self-reported less ability to perform daily work (physical

functioning).

According to the Brazilian Society of Nephrology Registry, between 1999 and 2005 there was a steady increase in the percentage of patients treated with APD, from 0.5% to 3.8%⁽¹²⁾. In Brazil, more than 90% of dialysis treatments are governmental funded and most dialysis facilities do indicate the dialysis modality better suited to each patient without considering financial burdens.

There is a widespread perception among Brazilian nephrologists that APD may give the patients a better HRQoL than in-center HD. APD is usually performed during nighttime, at the patient's home, saving time for regular daytime activities.

However, not all studies agree with this perception^(4, 10, 13-14) and data about the real impact of dialysis modalities on HRQoL is lacking. Nowadays, HRQoL is not only a basic aspect of health but it also has an impact in morbidity and mortality⁽¹⁵⁻¹⁸⁾.

We sought to study the population of a single center in an attempt to remove the bias of different dialysis prescriptions and criteria when multi-center studies are performed, giving homogeneity to our dialysis sample. However, we acknowledge that this decision may introduce specific center-factor bias to the final results with reference to other centers scenarios.

Also, this is as a cross-sectional study and not a randomized controlled trial, with differences in the baseline population characteristics. All these factors should be taken into account when extrapolating our results to other populations. Nevertheless, statistical analysis was adjusted for the differences found between groups.

In our dialysis center, the procedure is to introduce all dialysis modalities to patients before they choose one procedure. Therefore, there was not a bias in forcing one kind of treatment to a special population. The equal distribution of demographics and of risk factors in our population supports this notion.

We have also chosen to use the SF-36 as a tool for HRQoL measurement because it has been validated for the Portuguese language which is required for any HRQoL

tool^(2, 19-20). Besides, SF-36 is largely used in studies measuring HRQoL in chronic renal failure patients^(2, 4-11, 13-14, 20-35).

In this study, most of the results of the physical and mental domains were very similar between groups showing a similar HRQoL for both treatments. However, we found that the capacity to perform routine daily activities or to work (Physical Functioning) was diminished in APD patients. In the same way, the Bodily Pain dimension was higher (more intense) in APD patients, showing the intensity with which the dialysis procedure interferes in the patients daily activities.

The physical components of HRQoL are commonly reported as diminished in APD when compared with HD, while mental components are usually reported as similar^(4, 10, 13-14, 33).

The reasons why this physical component is reduced is not clear to us. In this study, HD patients had been treated for a long time compared to APD. Prolonged periods of treatment may adapt the patient and improve HRQoL perception, at least, in HD patients as compared to APD patients^(6, 33).

In the same way, low levels of serum albumin, found in the APD patients, are related to poor scores in HRQoL of end-stage renal disease patients, specially in the physical component^(13, 34). In this study we used adjusted values for serum albumin for statistical analysis and we have not found this correlation.

Therefore, the difference found in the physical component might be related to the dialysis method only and not associated with other contributing factors.

CONCLUSION

In summary, self-assessed HRQoL in APD patients is similar in many domains to that of HD patients but the Physical Functioning domain seems to be lower in APD patients. Larger studies are warranted to identify mechanisms that could explain this poorer component of HRQoL in APD patients.

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