Quality of life of hemodialysis patients waiting for kidney transplant

Kvalitet života bolesnika na hemodijalizi predviđenih za transplantaciju

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Abstract

Background/Aim. Dialysis and kidney transplantation are treatments that can be applied to patients with the end-stage renal disease. There is a lack of information on the quality of life (QOL) among hemodialysis (HD) patients on the waiting list for a kidney transplant, a group that is increasing all over the world. The aim of this study was to investigate the quality of life of patients on HD waiting for a kidney transplant. **Methods.** In the clinical comparative 12-month study, QOL level was compared between consecutively recruited patients waiting for a kidney transplant (WT patients) (N = 24) and patients not waiting for a kidney transplant (non-WT patients) (N = 52). All patients were older than 18 years and were on HD at least three months. To measure QOL, the short Form Health Survey (SD-36) was used. **Results.** WT patients were younger (43.50 ± 12.64 *vs* 63.58 ± 13.88 years; p < 0.001), they had started dialysis in the younger age (32.38 ± 14.50 *vs* 57.12 ± 15.79 years; p < 0.001) and spent more time on dialysis (112.04 ± 82.48 *vs* 72.40 ± 81.31 months; p < 0.05) than non-WT patients. Non-WT patients had more comorbidities than WT patients (p < 0.01). In laboratory parameters, there were statistically significant differences in values of serum creatinine (p < 0.01), phosphorus (p < 0.05)

and number used to quantyfy hemodialysis treatment adequacy (Kt/V index: K – dialyzer clearance of urea; t – dialysis time; V – volume of distribution of urea approx equal to patients' total body water) (p < 0.05). Mean scores were higher among WT patients compared to non-WT patients in four dimensions of QOL: Physical Function (PF) (83.33 ± 10.59 *vs* 66.53 ± 27.87; respectively p > 0.05), Role Physical (RP) (58.66 ± 21.39 *vs* 46.90 ± 23.73; respectively p > 0.05), General health (GH) (45.00 ± 14.81 *vs* 37.98 ± 12.88; respectively p > 0.05); Social Functioning (SF) (93.66 ± 16.10 *vs* 78.30 ± 29.80; respectively p > 0.05) including Physical Component Summary (PCS) scores (64.16 ± 13.77 *vs* 52.38 ± 19.53; respectively p > 0.05). **Conclusion.** Patients waiting for a kidney transplant were younger, had started dialysis in the younger age and spent longer on dialysis compared with patients not eligible for transplantation. Low comorbidity, better laboratory parameters interferes in all domains with higher values of QOL in patients waiting for a kidney transplant, especially in general health, physical conditions and social functioning.

Key words:
renal dialysis; kidney transplantation; quality of life; surveys and questionnaires.

Apstrakt

Uvod/Cilj. Dijaliza i transplantacija bubrega primenjuju se u lečenju bolesnike u terminalnoj fazi bubrežne insuficijencije. Postoji malo informacija o kvalitetu života bolesnika na dijalizi predviđenih za transplantaciju, grupi bolesnika koja se povećava u celom svetu. Cilj istraživanja bio je procena kvaliteta života bolesnika na dijalizi u terminalnoj fazi bubrežne insuficijencije, predviđenih za transplantaciju bubrega. **Metode.** U kliničkoj komparativnoj jednogodišnjoj studiji, poređene su vrednosti kvaliteta života bolesnika na dijalizi predviđenih za transplantaciju (N = 24) i bolesnika koji nisu predviđeni za transplantaciju (N = 52) bubrega. U istraživanje su bili uključeni samo bolesnici stariji od 18 godina, koji su bili na dijalizi najmanje tri meseca. Za merenje kvaliteta života je korištena kratka

forma Upitnika kvaliteta života (SF-36). **Rezultati.** Bolesnici predviđeni za transplantaciju bubrega bili su mlađi (43,50 ± 12,64 *vs* 63,58 ± 13,88 godina; p < 0,001), dijalizu su započeli u mlađem životnom dobu (32,38 ± 14,50 *vs* 57,12 ± 15,79 godine; (p < 0,001) i na dijalizi su duže od bolesnika koji nisu bili predviđeni za transplantaciju (112,04 ± 82,48 *vs* 72,40 ± 81,31 meseci; p < 0,05). Komorbiditet je bio veći kod bolesnika koji nisu bili predviđeni za transplantaciju p < 0,01). U laboratorijskim parametrima postojala je statistički značajna razlika za vrednosti kreatinina (p < 0,01) i fosfora (p < 0,05) u serumu i broja koji kvantifikuje adekvatnost hemodijalize (Kt/V index: K – dijalizni klirens uree; t – vreme dijalize; V – volumen distribucije ureee približno jednak ukupnoj telesnoj vodi bolesnika) (1,36 ± 0,12 *vs* 1,29 ± 0,19; p < 0,05). Na Upitniku kvaliteta života, bolesnici koji su bili predviđeni za

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transplantaciju u odnosu na one koji nisu bili predviđeni za transplantaciju imali su više srednje vrednosti za: Fizičko funkcionisanje (PF) (83,33 ± 10,59 *vs* 66,53 ± 27,87; *p* > 0,05), Ograničenje zbog fizičkih teškoća (RP) (58,66 ± 21,39 *vs* 46,90 ± 23,73; *p* > 0,05), Percepciju opšteg zdravlja (GH) (45,00 ± 14,81 *vs* 37,98 ± 12,88; *p* > 0,05); Socijalno funkcionisanje (SF) (93,66 ± 16,10 *vs* 78,30 ± 29,80; *p* > 0,05), kao i za domen Fizičko zdravlje (PCS) (64,16 ± 13,77 *vs* 52,38 ± 19,53; *p* > 0,05). **Zaključak.** Bolesnici predviđeni za transplantaciju bili su mlađeg životnog doba, dijalizu su počeli u mlađim godinama života, na dijalizi su bili duže od

bolesnika koji nisu bili predviđeni za transplantaciju. Niži komorbiditet, bolje laboratorijske vrednosti bili su u saglasnosti sa višim skorom na svim domenima kvaliteta života bolesnika predviđenih za transplantaciju, posebno u vezi sa njihovim boljim opštim zdravstvenim stanjem, fizičkom sposobnosti i socijalnim funkcionisanjem.

Introduction

Dialysis and kidney transplantation are treatments that can be applied to patients with the end-stage renal disease (ESRD) and represent a replacement for kidney function. Dialysis and kidney transplantation occur usually after several months or even years after the diagnosis of chronic kidney disease. The need for dialysis or transplantation is generally considered the best treatment for patients developing ESRD, both in the quality of life (QOL), long-term outcomes and financial burden on the society and patient. The importance of a successful kidney transplantation and survival is in reducing the risk of death among people treated by dialysis. People undergoing kidney transplantation save their time on daily dialysis too [1].

The choice between dialysis and transplantation is a complex problem. Patients must find the best solution together with their doctors, and frequently in consultation with their family members after careful consideration of all other factors. Many patients who are candidates for kidney transplantation are on waiting lists, but due to lack of transplantation organs, they need dialysis until a suitable organ for kidney transplantation is found. On the other hand, some people with kidney failure could not be candidates for transplantation. For patients with severe heart and vascular disease or for the elderly patients, treatment by dialysis is safer than kidney transplantation [2–4].

The quality of life is a multidimensional concept used to measure satisfaction or society to social and economic outcomes. However, the concept of QOL relates to a deeper meaning of an individual's experience of life and health. Healthcare researchers have demonstrated that the QOL has emerged as an important parameter for evaluating the quality of healthcare for patients with chronic diseases, because a chronic disease, with its physical and psychosocial characteristics, affects patients QOL. The concept of health-related QOL covers the patient's perceptions of his or her physical, emotional, cognitive and social functions and, importantly, disease symptoms and side effects of a treatment [5].

Comparing with a general population, it is a fact that patients with chronic kidney diseases have a worse QOL [6]. Assessment of QOL in patients with ESRD on dialysis treatment especially attracts an attention of researchers because it is a complex phenomenon which represents a

complex interaction of the negative consequences of primary renal disease and the positive aspects of dialysis treatment [7].

There are some investigations how QOL is changed in the transition from dialysis to renal transplantation [8–10] and few data about the QOL level among patients undergoing hemodialysis (HD) and not eligible for kidney transplantation [11–14]. But there is a lack of information on QOL among the group of HD patients waiting for a kidney transplant, a group that is increasing all over the world [15].

Knowing the predictors of waiting for a kidney transplant, quality of life can improve patient's quality of work and the treatment outcome. Accordingly, the aim of our study was to estimate QOL of patients with ESRD undergoing dialysis and waiting for a kidney transplant.

Methods

We conducted the investigation in patients treated at the Department for Dialysis, the Clinic for Nephrology, Military Medical Academy in Belgrade, Serbia, in the period from February 1, 2014 till March 3, 2014. We also collected data about lethal outcomes and receiving a kidney transplant in the following 12-month study period.

Department for Dialysis of the Clinic for Nephrology in the Military Medical Academy in Belgrade, Serbia, is a tertiary care referral centre for kidney diseases that performs more than 20,000 procedures on dialysis (hemodialysis, hemofiltration, hemodiafiltration and continuous dialysis procedures) *per* year. A multidisciplinary team of nephrologists, nurses and technicians is engaged there to ensure optimal outcomes for dialysis patients. For more than 30 years (from 1983) this institution has delivered a range of dialysis therapies supporting and facilitating patients who suffer from the severe renal failure. Innovative use of the latest technologies ensures the highest quality dialysis care, accessible and comfortable with significantly better outcomes.

Patients

During a period of 12 months, a total of 108 patients on HD were asked to participate in the study if they met the following inclusion criteria: age over 18 years, and HD treatment for at least three months. All patients on HD were previosly assessed by nephrologists. Thirty two patients were

excluded from the study. Some of them did not meet the inclusion criteria (less than three months on dialysis), or had serious somatic (cancer) and mental illnesses (demention), and 10 of them refused to sign the informed consent.

Ultimately, the sample group consisted of 76 ESRD patients undergoing HD (48 males and 28 females). They were divided into two groups. The first group included 24 (31.57%) patients waiting for a transplant (WT patients) and the second group included 52 (68,43 %) patients not waiting for transplant (non-WT patients).

In all patients, we also estimated the efficacy of the hemodialysis treatment, complications in terms of undernutrition, anemia and secondary parathyreoidism.

Questionnaires

In the study, we used Short Form Health Survey, 36-Item Quality of life Questionnaire (SF-36) and Sociodemographic and clinical questionnaire.

SF-36 is an internationally accepted generic measure of the QOL, which has been translated and adapted for the use in Serbian. It covers aspects of physical, psychological and social functioning. SF-36 includes one multi-item scale that assesses eight health status dimensions: 1) Physical functioning (PF): limitations in physical activities because of health problems; 2) Social functioning (SF): limitations in social activities because of physical or emotional problems; 3) Role physical (RP): limitations in usual role activities because of physical health problems; 4) Bodily pain (BP); 5) Mental health (MH): general mental health (psychological distress and well-being); 6) Role emotional (RE): limitations in usual role activities because of emotional problems; 7) Vitality (VT): feeling of energy and fatigue; and 8) General health (GH): general health perceptions. For each of the eight dimensions item scores were recorded, summed up, and transformed using a scoring algorithm into a scale ranging from 0 (worst) to 100 (best), with higher scores representing better results in view of the subjective perception of physical and mental health.

Sociodemographic characteristics of patients waiting and not waiting for a kidney transplant were obtained from semi-structured questionnaire, which was specifically designed for this study. Clinical characteristics, including the laboratory parameters routinely measured in HD patients, were obtained from the medical protocol in the Department for Dialysis.

Monthly patients' incomes were divided into three categories 1) less than 300 Euro *per* month (unfavorable); 2) 300 to 500 Euro *per* month (satisfying); 3) more than 500 Euro *per* month (favorable).

The kidney disease was classified by clinical criteria [Intenational Classification of Diseases – 10th revision (ICD-10)] and based on the National Registry of patients on chronic regularly repeated hemodialysis treatment.

Each patient was assigned to a low, medium or high-risk index based on presence of comorbidities as described by Khan et al.[16] (comorbidity index takes into consideration age in three classes and nine comorbidities: diabetes,

myocardial infarction, angina pectoris, congestive heart failure, liver cirrhosis, obstructive pulmonary disease, systemic collagen disease, pulmonary fibrosis, and visceral malignancies.

We also took into account a length of dialysis as an independent risk factor for complications, which is a direct consequence of some of these comorbid conditions, mainly cardiovascular, cerebrovascular, mineral-bone and hematologic ones.

All questionnaires were administrated by two qualified psychiatrists, that did not belong to the dialysis unit team.

This study was approved by the Ethics Committee of the Military Medical Academy in Belgrade. Written informed consent was obtained from all patients prior to their inclusion in the study. Confidentiality of the response was assured. The participation was completely voluntary, with neither financial nor other motivation.

Statistical analyses

Data analysis was carried out using Statistical Package for the Social Sciences (IBM SPSS) software version 20.0.

Following statistical tests were used: Student's *t*-test, χ^2-test, and Mann-Whitney test. Variables regarding sample characteristics including QOL scores were compared between patients waiting and those that were not waiting for a kidney transplant using Cronbach's alpha. In this research, QOL applied on our sample, had good internal consistency: Physical Component Summary (PCS) ($\alpha = 0.779$) and Mental Component Summary (MCS) (alpha $\alpha = 0.846$).

Differences were considered statistically significant when the *p*-value was < 0.05.

Results

Sociodemographic characteristics of patients included in the study are presented in Table 1. The mean age of patients was 57.24 ± 16.37 years (full sample), 43.50 ± 12.64 years (WT patients) and 63.58 ± 13.88 (non-WT patients). There were statistically significant differences among groups in age ($p < 0.001$) and in marital status ($p < 0.01$). As shown in Table 1, there were no statistically significant differences among groups in education, sex and monthly incomes.

Observing primary kidney diagnosis, WT patients more frequently suffered from glomerulonephritis and polycystic kidney. Graft failure was present in 41.7% WT patients. Non-WT patients more often suffered from Glomerulonephritis, hypertension, diabetes and obstructive uropathy (Figure 1).

Table 2 shows clinical characteristics of patients included in the study. There were statistically significant differences in all domains. WT patients were more frequently undergoing hemodiafiltration (54.2%), but non-WT patients were more frequently undergoing hemodialysis (88.5%) ($p < 0.001$). WT patients compared to non-WT patients started dialysis in the younger age (32.38 ± 14.50 *vs* 57.12 ± 15.79 years respectively; $p < 0.001$) and spent more time on dialysis (112.04 ± 82.48 *vs* 72.40 ± 81.31 months respectively; $p < 0.05$). Non-WT patients had higher

Sociodemographic characteristics of patients waiting (WT) and non-waiting transplantation (non-WT)

Variable	Full sample	WT	non-WT	p
Age of patients (years), x̄ ± SD	57.24 ± 16.37	43.50 ± 12.64	63.58 ± 13.88	0.001
(range)		(26–67)	(20–82)	
Education (years), x̄ ± SD	13.50 ± 3.31	12.79 ± 2.89	13.83 ± 3.47	0.176
Sex, n (%)				0.861
male	48 (63.2)	16 (66.7)	32 (61.5)	
female	28 (36.8)	8 (33.3)	20 (38.5)	
Monthly income, n (%)				0.271
unfavorable	7 (9.2)	4 (16.7)	3 (5.8)	
satisfying	31 (40.8)	10 (41.7)	21 (40.4)	
favorable	38 (50.0)	10 (41.7)	28 (53.8)	
Marital status, n (%)				0.01
married	50 (65.8)	12 (50.0)	38 (73.1)	
divorced	2 (2.6)	0	2 (3.8)	
widowed	8 (10.5)	1 (4.2)	7 (13.5)	
single	16 (21.1)	11 (45.8)	5 (9.6)	

x̄ – arithmetic mean; SD – standard deviation.

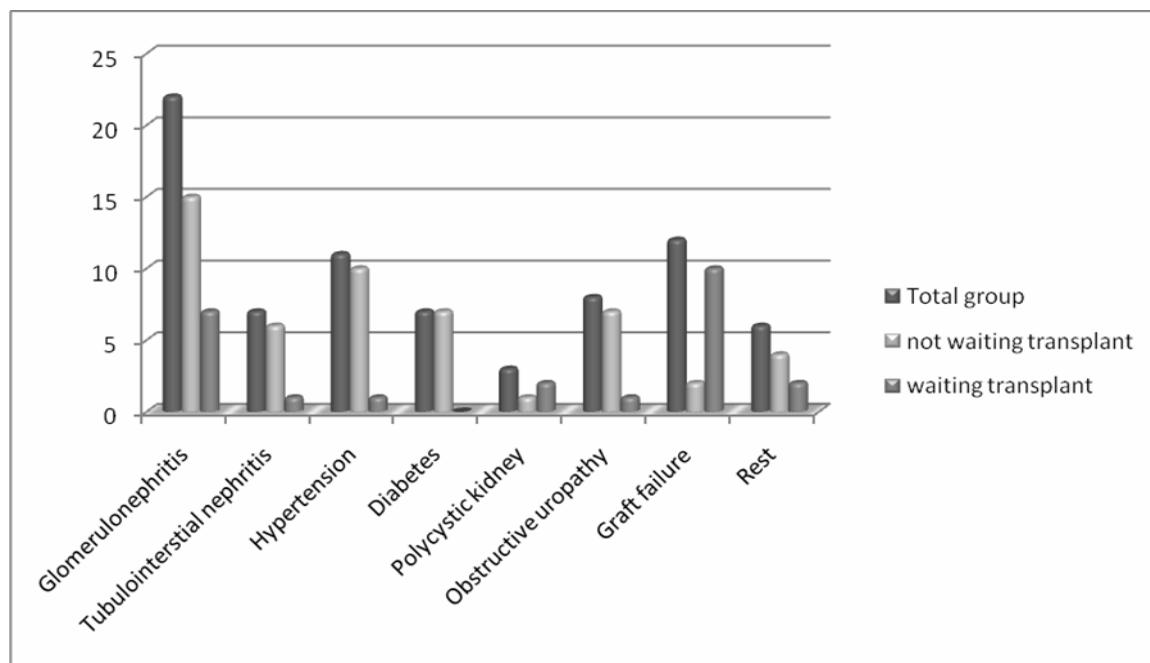Fig. 1 – Primary kidney disease of patients included in the study.

Clinical characteristics of patients waiting (WT) and not waiting transplantation (non-WT)

Variable	Full sample	WT	non-WT	p
Dialysis, n (%)				0.001
hemodiafiltration	19 (25.0)	13 (54.2)	6 (11.5)	
hemodialysis	57 (75.0)	11 (45.8)	46 (88.5)	
Dialysis beginning (years), x̄ ± SD (range)	49.30 ± 19.19	32.38 ± 14.50	57.12 ± 15.79	0.001
	(10–80)	(10–61)	(12–80)	
Duration of dialysis (months), x̄ ± SD (range)	84.92 ± 83.22	112.04 ± 82.48	72.40 ± 81.31	0.05
	(3–360)	(7–334)	(3–360)	
Death (follow-up 12 months), n (%)	5 (6.57)	1 (1.31)	4 (5.26)	0.001
Transplanted (follow-up 12 months), n (%)		3 (3.95)		
Comorbidity, n (%)				0.01
low	12 (15.8)	8 (33.3)	4 (7.7)	
medium	32 (42.1)	11 (45.8)	21 (40.4)	
high	32 (42.1)	5 (20.8)	27 (51.9)	

x̄ – arithmetic mean; SD – standard deviation.

comorbidity than WT patients ($p < 0.01$). In the follow-up 12-month period non-WT patients died more often than WT patients (5.26% *vs* 1.31%; $p < 0.001$). In the same period, three (3.95 %) patients received transplantation.

In laboratory parameters all values were higher in WT patients than in non-WT patients. There were statistically differences between groups in values of serum creatinine ($p < 0.01$), phosphorus ($p < 0.05$) and (Kt/V index: K – dialyzer clearance of urea; t – dialysis time; V – volume of distribution of urea approx equal to patients total body water), $p < 0.05$, (Table 3).

Table 4 shows the scores of the domains of SF-36 in studied groups. All scores were higher in WT patients than in non-WT patients. Significant differences between groups were found in four dimensions: PF ($p < 0.05$), RP ($p < 0.05$), GH ($p < 0.05$) and SF ($p < 0.05$), including PCS domain ($p < 0.05$).

Aiming to identify the factors that may have an adverse effect on the outcome, candidates for renal transplantation undergo an extensive pretransplantation evaluation. Every patient must be assessed for a degree of eligibility for the kidney transplantation procedure. Basic principles of eligibility assessment include: medical risk assessment, evaluation of psychosocial status and the level of family support. Assessment of patient's motivation level for a kidney transplantation is a very important factor, too.

Medical risk assessment involves establishing the etiology of the primary kidney disease, cardiovascular status assessment, risk assessment for renal graft thrombosis, screening for early malignancy detection, assessment of mineral metabolism and bone tissue disorders, immunological risk assessment and viral status assessment. The main reasons for refusing kidney transplantation are the unpredictability of

Table 3

Laboratory parameters of patients waiting (WT) and not waiting transplantation (non-WT)

Laboratory parameters	WT $\bar{x} \pm SD$	non-WT $\bar{x} \pm SD$	References ranges	p
Creatinine (μmol/L)	881.05 ± 254.55	766.02 ± 162.38	62–115	0.01
Hemoglobin (g/L)	115.59 ± 19.77	107.70 ± 16.70	130–180	0.076
Albumin (mol/L)	38.05 ± 6.059	37.15 ± 3.69	32–50	0.620
Calcium (mol/L)	2.30 ± 0.23	2.27 ± 0.19	2.15–2.60	0.136
Phosphorus (mol/L)	1.95 ± 0.51	1.66 ± 0.42	0.78–1.65	0.05
PTH pg/mL	103.95 ± 137.68	88.71 ± 113.83	120 ± 300	0.804
CRP mg/L	6.03 ± 7.13	12.14 ± 22.79	< 5	0.321
Kt/V index	1.36 ± 0.12	1.29 ± 0.19	> 1.2	0.05
Virus, n (%)				0.586
none	41 (78.8)	18 (75.0)		
HBV	3 (5.8)	3 (12.5)		
HCV	8 (15.4)	3 (12.5)		

PTH – parathiroid hormone; CRP – C reactive protein; Kt/V: K – dialyzer clearance of urea; t – dialysis time; V – volume of distribution of urea approx equal to patients total body water; HBV – hepatitis B virus; HBC – hepatitis C virus; $\bar{x}$ – arithmetic mean; SD – standard deviation.

Table 4

36-Item Short Form Quality of life Questionnaire (SF-36) scores in patients waiting (WT) and not waiting transplantation (non-WT)

Health status domain	Full sample ($\bar{x} \pm SD$)	WT ($\bar{x} \pm SD$)	non-WT ($\bar{x} \pm SD$)	p
PF	71.84 ± 24.98	83.33 ± 10.59	66.53 ± 27.87	**0.05**
RP	50.34 ± 23.34	58.66 ± 21.39	46.90 ± 23.73	**0.05**
BP	63.97 ± 34.03	71.29 ± 26.58	60.59 ± 36.70	0.299
GH	40.19 ± 13.81	45.00 ± 14.81	37.98 ± 12.88	**0.05**
PCS	56.11 ± 18.65	64.16 ± 13.77	52.38 ± 19.53	**0.05**
VT	52.59 ± 21.49	58.12 ± 17.75	50.03 ± 22.71	0.200
SF	83.27 ± 27.28	93.66 ± 16.10	78.30 ± 29.80	**0.05**
RE	63.69 ± 27.42	63.91 ± 26.53	63.59 ± 28.06	0.901
MH	64.14 ± 18.54	67.50 ± 17.10	62.59 ± 19.12	0.353
MCS	64.26 ± 20.12	70.37 ± 15.73	61.44 ± 21.40	0.125

PF – physical functioning; RP – role-physical; BP – bodily pain; GH – general health; VT – vitality; SF – social functioning; RE – role-emotional; MH – mental health; PCS – Physical Component Summary; MCS – Mental Component Summary.
$\bar{x}$ – arithmetic mean; SD – standard deviation.

Discussion

For many patients with chronic renal failure, kidney transplantation is considered the treatment of choice. Sometimes, is the best alternative to dialysis in terms of quality of life, cost-effectiveness and survival [11, 12].

transplantation outcome, the side-effects of immunosuppressive therapy and unfavorable outcomes in fellow patients [13]. On the other side, identification of patients with the highest degree of kidney transplantation eligibility will improve the quality of life in those patients and decrease morbidity and mortality in the same time [14].

In our investigation, we formed two groups from the sample consisted of 76 ESRD patients. Observing primary kidney diagnosis, patients from both groups more frequently suffered from glomerulonephritis, but non-WT patients more often had more comorbid diseases like diabetes, hypertension, obstructive uropathy and polycystic kidney. Glomerulonephritis, as the leading cause of terminal renal failure in both groups of patients, although not the leading cause of terminal renal failure according to the relevant epidemiological studies, has emerged as the most common in both groups of our patients, only due to the structure of the patients included in our study.

There were 10 (41.7%) patients undergoing hemodialysis with previous transplantation who were included in this study because terminal renal graft represents a condition equal to ESRD. Also, clinical estimation was that previous transplant could have significance for the patients quality of life by giving them hope that the re-transplant will be again successful.

In our study, more than one half non-WT patients had high comorbidity index that is in accordance with other similar investigations, indicating it as an important contributing factor to clinical outcomes and quality of life [8].

WT patients began HD on the average about 25 years earlier than non-WT patients and spent on HD more than three years longer than non-WT patients, as expected, because WT patients, besides being younger, started dialysis in the younger age compared to non-WT patients, and the duration of receiving dialysis treatment was longer.

We analyzed a wide spectrum of sociodemographic and clinical characteristics of patients and their influence on different aspects of QOL in order to reduce differences between groups that could have an influence on QOL.

The differences in socio-demographic characteristics between WT and non-WT patients were predictable. Sex, education level, and monthly income are not factors that are important for the assessment of patients for transplantation selection.

But, differences in age and marital status were expected. We can explain them with the fact that WT patients were on the average about 20 years younger than non-WT patients, and even five times more frequently single. On the other side, not-WT patients were older and more frequently married. Our results are in accordance with results reported by [16].

Some investigations suggested that elderly patients were a rapidly growing subset of the kidney transplantation waiting list, what our group of WT patients where the oldest had 67 years confirmed [16, 17].

In laboratory parameters, all values were higher in WT patients than in non-WT patients, and our findings are in accordance with the results of some other studies [15]. Statistically, significant differences were found in serum creatinine and phosphorus levels. A higher dose of dialysis estimated by Kt/V index in the WT patients is in accordance with mentioned study, too [15]. Laboratory differences between two groups of patients are related to conditions precluding transplantation. Non-WT patients had lower creatinine, be-cause of malnutrition and inflammation, and were submitted to a lower dose of dialysis, estimated by lower Kt/V index.

In the 12-months study period, 3.95% of the patients on the waiting list received transplantation and we consider it to be a good result. In the same period (6.58%) patients died. This is in accordance with other studies in which non-WT patients died more often than WT patients [16].

In our study, we found the connection between age, clinical characteristics, laboratory parameters and QOL of HD patients. Younger patients, who began HD earlier and spent longer on HD, with low comorbidity index and better laboratory parameters including serum creatinine and phosphorus levels, and lower Kt/V index, had higher values in all domains of QOL. On the other side, those precluded from transplantation were frequently older, with advanced comorbidities that decrease their QOL.

Analysing the SF-36, our study showed that patients undergoing HD and waiting for a kidney transplant had generally higher QOL scores in all domains compared with patients not eligible for transplantation. The lowest values were observed in both groups of patients in general health GH (less than 50%) and in RP, which was expected, taking into account difficult health condition of such patients.

There were statisticaly significant differences between groups in four of the eight dimensions. Three dimensions PF, RP, GH belong to Physical Function Summary (PF) domain and the fourth SF belongs to MCS domain.

PF domain measures the impact of physical health on life. Poor physical performance and poor outcome of renal disease are associated with significantly increased atrophy in the muscle and non-contractile tissue in all patients on hemodialysis. Physical QOL impairment increases the risk of graft failure and mortality too [18]. Prior to renal transplantation, increased controlled physical activity is highly recommended to all patients with chronic renal failure. Physical rehabilitation programs, could improve muscular strength, increase the ability for daily activities and encourage independent living. Accordingly, patients not eligible for transplantations are at higher risk of poor QOL level, mainly regarding PF and RP aspects and due to this, special attention could be paid to this group of patients. In this respect, physical rehabilitation programs can be valuable for all patients on dialysis [19–21].

It will be important to find out the main factors of such poor SF scores in non-WT patients. Both groups of patients were dialyzed in the Department for Dialysis, where they felt comfortable and friendly to hospital staff, which positively affected their mood. But WT patients were more optimistic which could have an influence on their answers in SF-36. We consider that besides clinical aspects, such as associated diseases and old age, the main factor of such a poor SF in the non-WT patients might be hopelessness because of no perspective for transplantation

Some investigations confirmed the close relationship between physical disorders, mental suffering, reduced vitality and lack of socialization. There are data on anxiety and depression among HD patients that are waiting for transplants. For them, the main stressors are psychological:

uncertainty of organ availability, mistrust, and anger when other candidates receive an organ, the possible adverse outcome of the transplantation, fear of being overlooked by the transplantation staff, etc. [19, 20].

On the other hand, in not-WT patients, not suitable candidates for kidney transplantation, total worse health condition, personal preferences and bad situations in their home are only part of the factors that must be taken into account. Some patients have no family support, and in specific, affective and painful conditions, they do not have to share pain, suffering, and grief with someone.

Our findings indicate a general need for psychosocial support for both groups of patients on dialysis. The psychiatrist and psychologist could help them improve their quality of life by providing new coping strategies for each member of the family, occupational and social network [22–24].

Conclusion

Patients waiting for kidney transplant compared with patients not eligible for transplantation are younger, started dialysis in the younger age and spent longer time on dialysis. They have fewer comorbidities and better laboratory parameters (serum creatinine, and phosphorus) including lower Kt/V index. They have higher values in all domains of QOL especially in general health, physical condition and social functioning.

Althgouh our study offer important and useful information on factors that influence QOL of the patients waiting for kidney transplantation, more research is needed in this field to confirm our findings.

Potential limitations of the study are a small sample of patients and the cross-sectional study design, which makes it impossible to know about changes in QOL over time. Finally, specific factors related to non-WT patients involved in the low QOL were not completely identified.

Acknowledgements

R E F E R E N C E S

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