

Health-related Quality of Life in the Patients on Maintenance Hemodialysis: The Analysis of Demographic and Clinical Factors

Daniela Germin-Petrović¹, Iva Mesaroš-Devčić², Ana Lesac³, Marin Mandić³, Marin Soldatić³, Dragana Vezmar³, Daniela Petrić⁴, Božidar Vujičić⁵, Nikolina Bašić-Jukić⁶ and Sanjin Rački⁵

¹ Istrian Health Centers, Umag Dialysis Center, Umag, Croatia

² Dialysis Center Fresenius Medical Care, Delnice, Croatia

³ University of Rijeka, School of Medicine, Rijeka, Croatia

⁴ University of Rijeka, Rijeka University Hospital Center, Department of Psychiatry, Rijeka, Croatia

⁵ University of Rijeka, Rijeka University Hospital Center, Department of Nephrology and Dialysis, Rijeka, Croatia

⁶ University of Zagreb, Zagreb University Hospital Center, Department of Nephrology, Hypertension and Dialysis, Zagreb, Croatia

ABSTRACT

Health-related quality of life (HRQoL) among hemodialysis (HD) patients recently became a nephrologist's focus of interest. HRQoL is an important predictor of outcome in HD patients and need to be regularly assessed. The aim of the present study was to compare the HRQoL of chronic HD patients with general population and to analyze influencing sociodemographic and clinical factors. We included 255 prevalent HD patients from four dialysis centers. HRQoL was measured with The Medical Outcomes Study Short Form 36 Health Survey Questionnaire (SF-36). This data were compared with control group (N=132) from the general Croatian population. Comparisons of SF-36 scale scores of HD patients regarding demographic and clinical factors (age, gender, education level, dialysis vintage and diabetes) were also performed and analyzed with a multivariate regression analysis. HRQoL in prevalent HD patients was relatively low (mean Physical Component Summary, PCS=33.7, mean Mental Component Summary, MCS=43.0) and was lower compared to the control group from the general population in all HRQoL domains, PCS and MCS scores. Almost 53% of the HD patients had the critical score PCS<43 + MCS<51 as the predictor of death and hospitalization. Better HRQoL was revealed in the patients <65 years old, males, patients with higher educational level and in the patients on maintenance HD less than one year. Age was the only statistically significant predictor of PCS and MCS. Developments of HD technology, treatment of comorbidities, continuous patients' education, social and psychological support and use of other renal replacement modalities, especially kidney transplantation, may improve the HRQoL in these patients.

Key words: end-stage renal disease, hemodialysis, health-related quality of life, SF-36

Introduction

In recent years, health-related quality of life (HRQoL) in end-stage renal disease (ESRD) patients has become a focus of interest in evaluating various modalities of renal replacement therapy (RRT)¹⁻⁴. In addition to mortality and morbidity, HRQoL assessment has become also an important outcome measure in the evaluating quality and effectiveness of medical care in ESRD^{1,5}. The concept of HRQoL explores the impact of disease and healthcare on patients, their functional status and their self-related health⁶.

Several studies on ESRD patients have reported impairment in HRQoL in hemodialysis (HD) patients^{1,7}. Recent reports have shown that questionnaire-derived assessment of HRQoL is a strong and independent predictor of mortality and morbidity in HD patients^{5,8-11}. The Dialysis Outcomes and Practice Patterns Study (DOPPS) concluded that a 10-point lower PCS of SF-36 was associated with higher elevation in the mortality risk than 1g/dL lower serum albumin level⁵. There is evi-

dence that a mental component of HRQoL predicts death and hospitalization in HD patients⁸. The HRQoL assessment may be applied to identify an individual's risk for important outcomes, such as death and hospitalization. Considering these facts, evaluation of HRQoL in the maintenance HD patients and analysis of the factors which have an influence on it, is an important objective.

According to the World Health Organization definition, quality of life (QoL) is a multidimensional category comprising physical, mental, social and economic components¹². Many factors can influence QoL, including demographic, medical and psychological parameters. Different generic and disease-specific questionnaires have been used for assessing the QoL in patients with advanced kidney disease¹³. Depending on the method used, various factors are identified as predictors of good or bad QoL. The Medical Outcomes Study Short Form 36 Health Survey (SF-36) is a generic QoL assessment instrument widely used to measure HRQoL in ESRD patients^{6,14}. The SF-36 is a patient-related questionnaire that includes assessment of physical function, social function, limitations due to physical health, limitations due to mental health, vitality, bodily pain and general health¹⁵. By investigating these eight dimensions, two final scores can be calculated: physical component summary (PCS) and mental component summary (MCS). According to that, the SF-36 allows comparison of QoL measured in individual patient with general population and among patients treated with methods of RRT^{16–19}. SF-36 final summary scores can be used as an additional factor for economic evaluation. Moreover, this self-assessment report provides the information that may not be possible through other methods⁸.

ESRD is a growing public health concern. Relevant studies regarding HRQoL assessment in HD patients in Croatia have not been performed previously.

The aim of present study was to investigate the HRQoL of chronic HD patients in the North-Adriatic region and to compare it with HRQoL of control group from the general population. Furthermore, our aim was to analyze sociodemographic and clinical factors influencing HRQoL in the maintenance HD patients in this region and compare our results with those from similar researches.

Subjects and Methods

Subjects

A total of 255 prevalent HD patients (male 53.7%, age 65.1±12.5 years) were included in this study as patient group. Patients were drawn from one hospital HD center (Rijeka, N=170) and three smaller out-patient HD centers (Umag, N=40; Labin, N=30; Delnice, N=15) in the North-Adriatic region of Croatia. All patients have been at least three months on dialysis which was performed three times a week, all on polysulphone dialysers. Exclusion criteria were congestive heart failure, severe chronic liver disease, acute infection, malignancy, pregnancy or

breastfeeding and cognitive impairment. The data were collected in 2008 and 2009.

Demographic (age, gender and education level), clinical data (HD duration and systolic arterial blood pressure) and biochemical parameters (hemoglobin, urea, creatinine, albumin and Kt/V) were abstracted from the patients' medical records at the time of enrollment.

The control group consisted of 132 persons without diagnosed any chronic kidney or mental disease. The participants were recruited in the family medicine units of Rijeka Medical Center. The control group matched the patient group in age and gender.

The study was approved by the Hospital's Ethical Committee. A written informed consent was obtained from all participants.

Methods

Each participant completed the SF-36 questionnaire form. The SF-36 is a 36-item questionnaire for assessment of HRQoL¹⁵. The SF-36 consists of eight dimensions: physical functioning, physical role limitations, general health perceptions, bodily pain, vitality, emotional role limitations, mental health and social functioning. The first four sub-scales can be combined as the PCS and last four as the MCS score. All sub-scales as well as the summary components are presented as scores between 0 and 100, with higher score indicating better HRQoL. The validity of the SF-36 has been tested in patients with renal disease, including kidney transplant recipients^{6,14}. The SF-36 questionnaire has been validated in the Croatian population^{16,17}. A demonstration of the SF-36 can be found at <http://www.sf-36.org/demos/SF-36.html>.

The questionnaire was self-administered and completed during regular HD session or during visits to family medicine unit.

Statistics

Statistical analysis was performed using Statistical Package for Social Sciences for Windows version 11.0 (SPSS Inc., Chicago, IL, USA).

Results from quantitative variables are expressed as mean±standard deviation (\bar{X} ±SD), results from qualitative variables are expressed as percentages. Intergroup differences were analyzed and compared using Student's t-test. The correlation between HRQoL sub-scales and continuous variables (age, hemoglobin and HD duration) was determined using linear regression analysis.

Multiple regression analysis was performed to analyze the relation between hemoglobin, albumin, HD treatment vintage, level of education and age with PCS and MCS HRQoL measure. A value for $p < 0.05$ was considered statistically significant.

Results

Demographic and clinical data of the patient group are presented in Table 1. In our study population 54.1% were aged ≥65 years. The predominant cause of end-

TABLE 1
DEMOGRAPHIC AND CLINICAL CHARACTERISTIC OF PATIENTS
ON CHRONIC HEMODIALYSIS (N=255)

Variable	
Age (years, $\bar{X}\pm SD$)	65.1 \pm 12.5
Gender (% males)	49.1
Living alone (%)	16.7
Education (years, $\bar{X}\pm SD$)	9.4 \pm 3.9
HD duration (months, $\bar{X}\pm SD$)	92.8 \pm 45.6
Kt/V ($\bar{X}\pm SD$)	1.23 \pm 0.25
Hb (g/L, $\bar{X}\pm SD$)	109.65 \pm 13.1
Albumin (g/L, $\bar{X}\pm SD$)	40.19 \pm 6.6
Predialysis systolic BP (mmHg, $\bar{X}\pm SD$)	140.0 \pm 19.8
Predialysis urea (mmol/L, $\bar{X}\pm SD$)	23.8 \pm 5.3
Predialysis creatinine (μ mol/L, $\bar{X}\pm SD$)	835.0 \pm 243.9
Currently on the transplantation waiting list (%)	25.1
Cause of end-stage renal disease (%)	
Diabetes mellitus	26.5
Glomerulonephritis	23.1
Interstitial disease	20.4
Renal vascular and hypertension	13.6
Polycystic kidney disease	8.8
Other	8.2

*HD – hemodialysis, Kt/V – delivered dialysis dose, Hb – hemoglobin, \bar{X} – mean, SD – standard deviation

-stage renal disease was diabetes (26.5%). There were not any statistically significant differences between the HD patients and the controls regarding age and gender.

Mean scores of the HRQoL domains of the HD patients and control group are presented in Figure 1. The mean scores of all eight sub-scales of SF-36 were lower in HD patients compared with those found in controls. The results of cut-off scores for PCS and MCS (predictors of death and hospitalization PCS<43, MCS<51 and depression MCS<43)^{8,20} are presented in Table 2. Considering these criteria, we found a PCS<43 in 74.0% of patients, a MCS<51 in 67.8% of patients and PCS<43+MCS<51 in 52.7% of patients. A cut-off value for depres-

TABLE 2
CUT-OFF HEALTH-RELATED QUALITY OF LIFE SCORES IN
HEMODIALYSIS PATIENTS [PREDICTORS OF DEATH AND
HOSPITALIZATION: PHYSICAL COMPONENT SUMMARY<43,
MENTAL COMPONENT SUMMARY<51⁸ AND PREDICTOR OF
DEPRESSION: MENTAL COMPONENT SUMMARY<43²⁰]

	PCS<43	MCS<51	PCS<43 + MCS<51	MCS<43
<65 years (%)	62.7	59.7	40.3	37.3
\geq 65 years (%)	83.5	77.7	63.3	53.2
Total (%)	74.0	67.8	52.7	45.9

* PCS – Physical Component Summary; MCS – Mental Component Summary

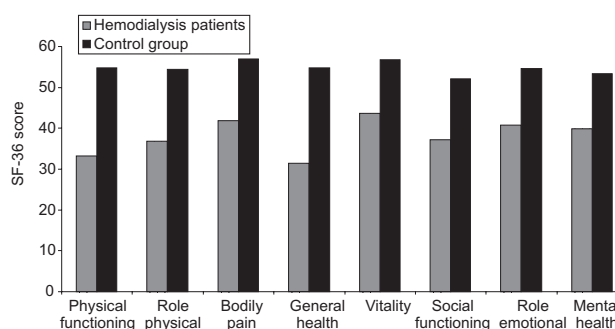


Fig. 1. Comparison of SF-36 scores in hemodialysis patients and controls. Statistically significant difference ($p<0.001$) was observed between hemodialysis patients and control group for all tested parameters.

sion MCS<43 had 45.9% of patient. Among HD patients aged \geq 65 years, the analyzed scores were found in 83.5; 77.7; 63.3 and 53.2% respectively.

Comparisons of SF-36 scale scores by demographic and clinical factors are shown in Tables 3 and 4. Patients aged \geq 65 years scored significantly lower in all HRQoL dimensions, PCS and MCS. Scores for all HRQoL dimension were lower in female patients, but statistically significant difference was found only for role physical ($p=0.023$) and mental health ($p=0.036$), while for vitality and PCS the significance was on level $p=0.05$. Comparison of SF-36 scores by education level demonstrated a significant influence in all HRQoL dimensions, including PCS and MCS. Patients with medium or high education level (>8 years) had significantly higher SF-36 scores than patients with low education level (≤ 8 years). Analyzing the HD duration, the significant difference was found in only two dimension of HRQoL. Patients who started dialysis more than one year ago scored lower for physical functioning ($p=0.042$) and social functioning ($p=0.046$). There were no significant differences in HRQoL scores by the presence of diabetes in HD patient group (Table 5).

Table 6 summarizes the results from the linear regression analysis. PCS, MCS and all SF-36 domains except general health were found to be influenced negatively by age, while role physical, vitality, role emotional and MCS were influenced positively by years of education. Role physical, general health and vitality correlated positively with Hb.

The effects of Hb, albumin, HD duration, level of education and age on PCS were tested by multiple regression analysis. PCS was predicted only by age ($R^2=0.15$; $\beta=-0.32$; $p<0.001$). The same predictors were correlated with MCS as dependent variable. The results showed that MCS was significantly predicted also only by age ($R^2=0.075$; $\beta=-0.174$; $p<0.05$).

Discussion

The aim of the present study was to examine the HRQoL in maintenance HD patients in the North-Adri-

TABLE 3
COMPARISON OF SF-36 SCORES IN HEMODIALYSIS PATIENTS BY AGE AND GENDER

	Age		P	Gender		P
	<65 years X̄±SD	≥65 years X̄±SD		Female X̄±SD	Male X̄±SD	
Physical functioning	39.6±10.1	30.3±13.6	<0.001	32.7±12.9	36.4±12.9	0.080
Role physical	41.3±12.3	33.1±10.1	<0.001	34.6±10.5	39.0±12.7	0.023
Bodily pain	47.0±12.3	37.4±12.4	<0.001	39.9±12.4	43.7±13.9	0.088
General health	33.6±9.6	29.2±7.7	0.003	30.9±8.4	31.5±9.4	0.694
Vitality	46.6±9.8	40.5±10	<0.001	41.7±9.9	45.0±10.6	0.050
Social functioning	42.5±9.4	34.7±12	<0.001	36.8±11.1	39.7±11.8	0.121
Role emotional	45.3±13.1	38.9±14.2	0.005	40.6±13.8	43.1±14.2	0.285
Mental health	43.3±10.8	37.7±12.5	0.005	38.2±11.1	42.4±12.6	0.036
Physical component summary	39.1±9.2	30.4±10.8	<0.001	32.8±10.6	35.9±11.2	0.051
Mental component summary	46.1±10.8	41.3±12.8	0.016	42.1±11.7	44.9±12.4	0.156

*X̄ – mean, SD – standard deviation

TABLE 4
COMPARISON OF SF-36 SCORE IN HEMODIALYSIS PATIENTS BY EDUCATION LEVEL AND HEMODIALYSIS TREATMENT VINTAGE

	Education level		P	HD treatment vintage		P
	Education level >8 years X̄±SD	Education level ≤8 years X̄±SD		≤1 year on HD X̄±SD	>1 year on HD X̄±SD	
Physical functioning	39.2±12	30.3±12.4	<0.001	38.9±10.1	33.8±13.3	0.042
Role physical	42.0±12.3	32.2±9.2	<0.001	38.6±9.7	36.5±12.1	0.381
Bodily pain	45.1±13.6	38.8±2.2	0.005	42.0±11.1	41.7±13.6	0.908
General health	34.0±9.5	28.6±7.5	<0.001	30.1±7.6	31.4±9.1	0.459
Vitality	47.8±10.1	39.4±8.8	<0.001	42.7±9.3	43.5±10.5	0.718
Social functioning	42.6±10.3	34.3±11.2	<0.001	41.8±9.1	37.6±11.8	0.047
Role emotional	47.3±12.2	37.0±13.8	<0.001	44.7±12.9	41.2±14.2	0.250
Mental health	45.0±11.3	36.0±11.1	<0.001	41.0±9.1	40.1±12.5	0.709
Physical component summary	38.0±10.9	31.1±10.0	<0.001	36.4±8.9	34.1±11.3	0.282
Mental component summary	48.3±11.0	39.3±11.6	<0.001	44.5±10.5	43.3±12.4	0.629

*X̄ – mean, SD – standard deviation

atic region of Croatia and to analyze sociodemographic and clinical factors influencing HRQoL in this patient group.

To our knowledge, this is the first report of HRQoL in Croatian HD patients using SF-36 questionnaire. Our study demonstrated that HRQoL of patients on chronic HD is severely impaired compared to the control group without kidney disease from the general population. In that way, we assessed the impact of ESRD and renal replacement therapy on patients' perception of health. Our results showed relatively low HRQoL in the sample of prevalent HD patients, similar to previous published studies^{1,18,19}. As expected, HD patients demonstrated lower HRQoL status than the controls from the general population. HD patients scored lower in all physical, social and mental HRQoL domains, as in PCS and MCS

scores. These results are consistent with data from other comparable national studies in HD patients^{21,22}.

Table 7 shows HRQoL summary scores of HD patients from the North-Adriatic region of Croatia and those from several international studies. Comparing to HD patients enrolled in DOPPS and Russian study, Croatian HD patients had lower PCS and almost equal MCS^{1,19}. The difference between our study population and HD patients from Romania was even more prominent¹⁸. A possible explanation for the differences in PCS is the fact that our population was older than the patients enrolled in DOPPS (65.1 *versus* 59.9 years), in Russian (43.5 years) and Romanian study (51.7 years). The results of previous studies on HRQoL showed that age have a negative impact on PCS in HD patients^{1,13,22}. Mingardi et al. reported that aging had a negative effect

TABLE 5
COMPARISON OF SF-36 SCORES IN DIABETIC AND NONDIABETIC HEMODIALYSIS PATIENTS

	Diabetic HD patients $\bar{X}\pm SD$	Nondiabetic HD patients $\bar{X}\pm SD$	p
Physical functioning	30.7±12.9	35.5±12.4	0.076
Role physical	36.3±12.1	37.0±10.4	0.758
Bodily pain	40.6±13.6	42.0±11.5	0.569
General health	29.9±8.9	31.5±8.9	0.373
Vitality	42.2±10.8	43.6±7.6	0.426
Social functioning	38.0±11.3	38.3±12.4	0.911
Role emotional	43.7±13.9	41.3±14.6	0.426
Mental health	39.0±12.5	40.5±9.4	0.484
Physical component summary	32.4±11.4	34.9±9.1	0.215
Mental component summary	44.3±12.3	43.2±11.3	0.662

*HD – hemodialysis, \bar{X} – mean, SD – standard deviation

TABLE 6
CORRELATION BETWEEN HEALTH-RELATED QUALITY OF LIFE SUB-SCALES OF HEMODIALYSIS PATIENTS, PHYSICAL COMPONENT SUMMARY, MENTAL COMPONENT SUMMARY AND AGE, YEARS OF EDUCATION AND HEMOGLOBIN DETERMINED BY LINEAR REGRESSION ANALYSIS

	Age (years)			Years of education (years)			Hemoglobin (g/L)		
	R ²	b	p	R ²	b	p	R ²	b	p
Physical functioning	0.125	-0.391	<0.001	0.010	0.329	0.280	0.031	0.152	0.048
Role physical	0.127	-0.353	<0.001	0.036	0.564	0.038	0.005	0.057	0.422
Bodily pain	0.104	-0.350	<0.001	0.008	0.294	0.327	0.002	0.037	0.631
General health	0.021	-0.104	0.118	0.013	0.252	0.211	0.035	0.107	0.041
Vitality	0.082	-0.241	0.001	0.061	0.627	0.006	0.038	0.127	0.033
Social functioning	0.125	-0.345	<0.001	0.026	0.476	0.077	0.024	0.118	0.090
Role emotional	0.079	-0.332	0.002	0.036	0.679	0.037	0.007	0.075	0.378
Mental health	0.052	-0.222	0.012	0.022	0.439	0.103	0.006	0.058	0.408
Physical component summary	0.134	-0.328	<0.001	0.009	0.263	0.290	0.019	0.097	0.128
Mental component summary	0.051	-0.226	0.013	0.041	0.611	0.026	0.009	0.073	0.304

on HRQoL with more evident impact on physical domains²². The prevalence of diabetes was 26.5% in our HD patients group, while the prevalence was lower in DOPPS, Russian and Romanian sample (13.8; 3.5 and 8.2% respectively)^{1,18,19}. This finding reflects the facts that cohort of diabetic patients treated with HD in the North-Adriatic region of Croatia is large and that diabetes has

become the main cause of ESRD²⁴. Diabetes has been associated with poorer HRQoL in HD patients as reported in the study performed by Lopez Reuvelta et al.⁹. However, in our study diabetes did not impact on the SF-36 scores.

Our results demonstrated that MCS scores were higher than PCS scores, similar findings were presented in

TABLE 7
COMPARISON OF PHYSICAL COMPONENT SUMMARY SCORES AND MENTAL COMPONENT SUMMARY SCORES IN DIFFERENT HEMODIALYSIS POPULATION

	Germin et al.	Seica et al. ¹⁸	Fukuhara et al. ¹	Vasilieva ¹⁹
Patients	255	606	2406	1047
Mean age	65.1	51.7	59.9	43.5
PCS	33.7	46.3	35.5	36.9
MCS	43.0	55.1	43.2	44.2

* PCS – Physical Component Summary; MCS – Mental Component Summary

other studies in HD patients^{19,22,23}. This could be the result from the use of adaptive coping strategies and dynamic adaptation of patients' expectations to their chronic illness^{21,25}. The difference between PCS and MCS scores point at relatively preserved mental health of dialysis patients despite the worsening of the physical health status.

A half of the HD population enrolled in our study have critical, both PCS and MCS scores, correlated with increased risk of death and hospitalization. Lowrie et al. reported a higher risk for death and hospitalization in HD patients having the critical scores, a one-point increase in PCS is associated with a 2% reduction in mortality, independently of demographic and comorbid variables⁸. This facts could be a consequence of a high proportion of patients aged ≥ 65 years in our HD population. The proportion of elderly people in Croatian HD population has recently become a significant issue because the median of age of Croatian HD patients in 2008 was 67 years²⁵. A possible explanation for the low score of PCS lies in the fact that the functional impairment and disability in elderly HD patients was found to be higher than in age-matched controls, as stated by Altintepe et al.²⁶. Moreover, Altintepe et al. reported higher depression and anxiety symptoms score in elderly HD patients and lower MCS compared to age-matched controls²⁶. The prevalence of depression detected by critical score of MCS ≤ 43 , established by DeOreo et al., was higher than that reported by Seica et al.^{18,20}. Previous studies reported that older age and depression level were associated with PCS negatively and that the depression level was a significant and independent predictor of both PCS and MCS¹⁹. This means that the presence of depression has a significant impact on both physical and mental aspects of HRQoL. Furthermore, the lower educational level and income of elderly patients on maintenance HD are the conditions that could be associated with lower HRQoL²⁷. In agreement with these findings are our results that demonstrated the significant negative correlation of age on almost all domains of HRQoL, including PCS and MCS.

In our study women reported lower HRQoL scores than men, as already stated in other studies^{18,22,28}. Women had significantly lower scores in role physical and mental health domains, while for vitality and PCS the significance level was $p=0.05$. These results suggest that women with chronic illness might have lower levels of social support in their everyday activities.

Results from our study showed that a ≤ 8 years of education was associated with lower HRQoL. HD patients with ≤ 8 years of education scored lower in all domains and summary scores than those with >8 years. This finding agree with results of Mingardi et al. and Rebollo et al. who also found a significant association between low educational level and low HRQoL^{22,28}. The possible explanation is that lower educational level is usually associated with lower income and, as a consequence, with lower HRQoL.

An interesting result found in our HD patients was lower scores in physical and social functioning in patients dialyzed for more than one year. This may be explained by the impact of the chronic illness and HD treatment regiments interfering on QoL.

In the present study, age had a negative impact on both PCS and MCS, that is in agreement with previous studies^{18,19}. Using multiple regression analysis, age was the only statistically significant predictor of PCS ($p < 0.001$) and MCS ($p < 0.05$), accounting for 15% of the variance for PCS and 7.5% variance for MCS. These results strongly suggest that age is an important contributor to low HRQoL in the HD patients in North-Adriatic region of Croatia. In addition, obtained results also emphasize that HRQoL is influenced by different still unrecognized factors and that HD patients should deserve further psychological and social attention. Depression is identified as the most common mental problem in patients on chronic hemodialysis and a powerful predictor of quality of life^{29,30}. Both clinically diagnosed depression and presence of depressive symptoms are associated with impaired HRQoL in this patient population. Hearing impairment is also frequent in ESRD patients, particularly sensorineural hearing loss³¹. Moreover, these disorders are rarely diagnosed and insufficiently treated.

Several limitations of our study should be noted. A relatively small number of patients enrolled, older age and high percentage of diabetic patients should be considered while interpreting the results of our study. However, the results reflect the fact that all the patients on chronic HD in dialysis centers Rijeka, Umag, Labin and Delnice were included in the study. The specific demographic and clinical features of the studied population are in agreement to the data presented in Croatian Registry for Renal Replacement Therapy²³. In spite of these limitations, our results can be compared with most of the studies that analysed QoL in HD patients.

In conclusion, our study shows that HRQoL in the HD patients in the North-Adriatic region is lower compared with the general population. Several sociodemographic and clinical variables, as older age, female gender, low educational level and more than one year of HD treatment are associated with lower HRQoL. The older age was found as the only independent negative predictor for both PCS and MCS. Further studies are needed to better understand the influence of other factors on HRQoL and to develop interventions to improve HRQoL in ESRD patients.

Acknowledgements

We are grateful to all patients and medical staff that participated in this project. We would like to thank to all collaborators for collecting the data used in this project as follows: Martina Pavletić-Peršić, MD, Vinko Brozović, MD and Milena Tenčić, MD.

REFERENCES

1. FUKUHARA S, LOPES AA, BRAGG-GRESHAM JL, KUOKAWA K, MAPES DL, AKIZAWA T, BOMMER J, CANAUD BJ, PORT FK, HELD PJ, *Kidney Int*, 64 (2003) 1903. — 2. MAZAIRAC AH, DE VIT GA, PENNE EL, VAN DER WEERD NC, DE JONG B, GROOTEMAN MP, VAN DEN DORPEL MA, BUSKENS E, DEKKER FW, NUBÉ MJ, TER WEE PM, BOESCHOTEN EW, BOTS ML, BLANKESTIJN PJ, *Nephrol Dial Transplant*, 26 (2011) 1984. — 3. BROWN EA, JOHANSSON L, FARRINGTON K, GALLAGHER H, SENSKY T, GORDON F, DA SILVA-GANE M, BECKETT N, HICKSON M, *Nephrol Dial Transplant*, 25 (2010) 3755. — 4. CAMERON JI, WHITESIDE C, KATZ J, DEVINS GM, *Am J Kidney Dis*, 35 (2000) 629. — 5. MAPES DL, LOPES AA, SATAYATHUM S, MCCULLOUGH KP, GOODKIN DA, LOCATELLI F, FUKUHARA S, YOUNG EW, KUOKAWA K, SAITO A, BOMMER J, WOLFE RA, HELD PJ, PORT FK, *Kidney Int*, 64 (2003) 339. — 6. WRIGHT JP, EDWARDS L, BRAZIER J, WALTERS S, PAYNE JN, BROWN CB, *Qual Health Care*, 7 (1998) 209. — 7. WASSERFALLEN J, HALABI G, SAUDAN P, PERNERGER T, FELDMAN HI, MARTIN P, WAULTERS J, *Nephrol Dial Transplant*, 19 (2004) 1594. — 8. LOWRIE EG, CURTIN RB, LEPAIN N, SCHATTELL D, *Am J Kidney Dis*, 41 (2003) 1286. — 9. LOPEZ REUVELTA K, GARCIA LOPEZ FJ, DE ALVARO MORENO F, ALONSO J, *Nephrol Dial Transplant*, 19 (2004) 2347. — 10. MERKUS MP, JAGER KJ, DEKKER FW, DE HAAN RJ, BOESCHOTEN EW, KREDIET RT, *Am J Kidney Dis*, 35 (2000) 69. — 11. KNIGHT EL, OFSTHUN N, TENG M, LAZARUS JM, CURHAN GC, *Kidney Int*, 63 (2003) 1843. — 12. THE WORLD HEALTH ORGANISATION QUALITY OF LIFE ASSESSMENT (WHOQOL): POSITION PAPER FROM THE WORLD HEALTH ORGANISATION, *Soc Sci Med*, 41 (1995) 1403. — 13. APOLONE G, MOSCONI P, *Nephrol Dial Transplant*, 13 (1998) 65. — 14. GOMES-BESTEIRO MI, SANTIAGO-PEREZ MI, ALONSO-HERNANDEZ A, VALDÉS-CANEDO F, REBOLLO-ALVAREZ P, *Am J Nephrol*, 24 (2004) 346. — 15. WARE JE, SNOW KK, KOSINSKI M, GANDEK B, SF-36 Health Survey Manual and Interpretation Guide, (The Health Institute – New England Medical Center, Boston, 1993). — 16. MAVRINAC GV, SERSIĆ DM, MUJKIĆ A, *Coll Antropol*, 33 (Suppl 1) (2009) 99. — 17. JUREŠA V, IVANKOVIĆ D, VULETIĆ G, BABIĆ-BANASZAK A, SRCEK I, MASTILICA M, BUDAK A, *Coll Antropol*, 24 (2000) 69. — 18. SEICA A, SEGALL L, VERZAN C, VADUVA N, MADINCEA M, RUSOIU S, CRISTEA S, STEFAN M, SERBANESCU D, MOROSANU P, GRAJDEANU L, ANDRONACHE R, NECHITA M, DRAGOS D, DRONCA A, GUSBETH-TATOMIR P, MIRESCU G, COVIC A, *Nephrol Dial Transplant*, 24 (2009) 626. — 19. VASILIEVA IA, *Hemodial Int*, 10 (2006) 274. — 20. DEOREO PB, *Am J Kidney Dis*, 30 (1997) 204. — 21. COVIC A, SEICA A, GUSBETH-TATOMIR P, GAVRILOVICI O, GOLDSMITH DJ, *Nephrol Dial Transplant*, 19 (2004) 2078. — 22. MINGARDI G, CORNALBA L, CORTINOVIS E, RUGGIATA R, MOSCONI P, APOLONE G, *Nephrol Dial Transplant*, 14 (1999) 1503. — 23. DE JONGE P, RUINEMANS GMF, HUYSE FJ, TER WEE PM, *Nephrol Dial Transplant*, 18 (2003) 2622. — 24. CROATIAN SOCIETY FOR NEPHROLOGY, DIALYSIS AND TRANSPLANTATION, CROATIAN REGISTRY FOR RENAL REPLACEMENT THERAPY 2008., accessed 15.12.2010. Available from: URL: <http://www.hdnrd.org/registar-forward.htm>. — 25. SINGER MA, HOPMAN WM, MACKENZIE TA, *Qual Life Res*, 8 (1999) 687. — 26. ALTINTEPE L, LEVENDOGLU F, OKUDAN N, GUNEY I, SAVAS CILLI A, UGURLU H, TONBUL Z, GOKBEL H, TURK S, *Hemodial Int*, 10 (2006) 260. — 27. STOJANOVIĆ M, STEFANOVIĆ V, *Artif Organs*, 31 (2007) 53. — 28. REBOLLO P, ORTEGA F, BALTAR JM, DÍAZ-CORTE C, NAVASCUÉS RA, NAVES M, UREÑA A, BADÍA X, ALVAREZ-UDE F, ALVAREZ-GRANDE J, *Geriatr Nephrol Urol*, 8 (1998) 85. — 29. KLARIĆ M, LETICA I, PETROV B, TOMIĆ M, KLARIĆ B, LETICA L, FRANČIŠKOVIĆ T, *Coll Antropol*, 33 Suppl 2 (2009) 153. — 30. FINKELSTEIN FO, WUERTH D, FINKELSTEIN SH, *Blood Purif* 29 (2010) 121. — 31. JAKIĆ M, MIHALJEVIĆ D, ZIBAR L, JAKIĆ M, KOTROMANOVIĆ Ž, ROGULJIĆ H, *Coll Antropol*, 34 (Suppl 1) (2010) 165.

D. Germin-Petrović

Istrian Health Centers, Umag Dialysis Center, E. Pascali 2a, 52470 Umag, Croatia
e-mail: daniela.germin@pu.t-com.hr

KVALITETA ŽIVOTA UVJETOVANA ZDRAVLJEM U BOLESNIKA NA REDOVITOJ HEMODIJALIZI – ANALIZA DEMOGRAFSKIH I KLINIČKIH ČIMBENIKA

SAŽETAK

Kvaliteta života uvjetovana zdravljem (»Health-related Quality of Life – HRQoL«) u bolesnika na redovitoj hemodijalizi (HD) odnedavno je u fokusu interesa nefrologa. HRQoL je potrebno redovito procjenjivati, jer predstavlja važan prediktor ishoda liječenja u HD bolesnika. Cilj ovog istraživanja bio je usporediti HRQoL bolesnika na redovitoj HD s općom populacijom te analizirati utjecaj sociodemografskih i kliničkih čimbenika na HRQoL. U istraživanje je uključeno 255 bolesnika iz četiri centara za dijalizu. HRQoL je mjerena korištenjem »Medical Outcomes Study Short Form 36 Health Survey« upitnika (SF-36). Ovi podaci su uspoređeni s kontrolnom skupinom (N=132) iz opće hrvatske populacije. Osim usporedbe SF-36 samoprocjenjske skale bolesnika na HD s obzirom na različite demografske i kliničke čimbenike (dob, spol, stupanj obrazovanja, trajanje liječenja dijalizom i prisustvo šećerne bolesti), izvršena je i multivarijatna regresijska analiza navedenih parametara. HRQoL u bolesnika na HD bila je relativno niska (srednje vrijednosti »Physical Component Summary« – PCS=33,7, »Mental Component Summary« – MCS=43,0) te niža u usporedbi s kontrolnom skupinom iz opće populacije u svim domenama HRQoL, PCS i MCS rezultatima. Gotovo 53% bolesnika liječenih HD imalo je kriterije PCS<43 i MCS<51, koji predstavljaju prediktore veće smrtnosti i češćih hospitalizacija. Bolja HRQoL je zabilježena kod bolesnika <65 godina, muškaraca, bolesnika sa višim stupnjem obrazovanja te u bolesnika liječenih HD kraće od jedne godine. Starija dob je bila jedini neovisni prediktor PCS i MCS. Razvoj dijalizne tehnologije, liječenje pridruženih bolesti, kontinuirana edukacija bolesnika, socijalna i psihološka podrška te korištenje drugih metoda nadomještanja bubrežne funkcije, osobito transplantacije bubrega, može poboljšati HRQoL u ovoj populaciji bolesnika.