

# Investigation of life quality and depression intensity in patients with arterial hypertension receiving maintenance hemodialysis treatment

**Kazakova I.A., Ievlev E.N.\***

Izhevsk State Medical Academy, Izhevsk, Russia

## Authors:

**Irina A. Kazakova**, M.D., Ph.D., doctor of sciences, head of the department of internal medicine with the course of radiologic diagnostics and treatment, Izhevsk State Medical Academy, Izhevsk, Russia  
**Evgeny N. Ievlev**, M.D., assistant professor at the department of internal medicine with the course of radiologic diagnostics and treatment, Izhevsk State Medical Academy, Izhevsk, Russia

## Summary

### Objective

*To detect the characteristics of life quality (LQ) and depression intensity in patients with arterial hypertension receiving maintenance hemodialysis treatment in the Udmurt Republic.*

### Materials and methods

*We performed the analysis of LQ in 248 patients with chronic kidney disease (CKD), stage 5, receiving maintenance hemodialysis treatment in the Udmurt Republic. The average duration of dialysis in this patients was  $5.6 \pm 5.5$  years. Analysis was performed using Beck's Depression Inventory (1961) and specific questionnaire Kidney Disease Quality of Life Short Form (KDQOL-SF™), Russified by I.A.Vasilieva in 2006.*

### Results

*We identified that LQ characteristics in people with AH receiving maintenance hemodialysis were lower than the ones of patients with normal and low AH according with the majority of scales. mostly due to the reduction of mental component:  $38.6 \pm 9.5$  versus  $44.4 \pm 12.6$  ( $p < 0.01$ ) and  $49.5 \pm 8.4$  ( $p < 0.001$ ), correspondingly. Patients with AH demonstrated lower values for the majority of scales reflecting specific kidney disorders in patients with AH. Significant difference between studied group and both comparison groups was found for scales "Symptoms/problems", "Cognitive functions", "Sexual function". The differences in scales "Labour ability" and "Support by dialysis*

*staff" was not found. It was detected that the patients with AH have more evident depression symptoms. We also identified the correlation between depression and scales of LQ related to mental component. We did not detect the connection of depression with LQ scales characterizing the quality of medical services and psychological support by dialysis staff.*

### **Conclusion**

*The results of this study demonstrate that the patients with AH receiving maintenance hemodialysis had more evident depression and lowered life quality according with all scales, dominantly because of the mental component. Patients with AH, 3 stage, demonstrated low values in all scales reflecting the prominence of disease symptoms and their influence on physical component.*

### **Key words**

*Arterial hypertension, chronic kidney disease, life quality, depression, sexual function*

Improvement of renal replacement therapy's (RRT) techniques provided significant reduction of mortality rate and exposed the problem of life quality (LQ) in patients with chronic kidney disease (CKD). It is particularly important for modern cardiology and nephrology to bring LQ parameters of the patients undergoing hemodialysis (HD) to the level of population ones. Russian and foreign authors mark out some aspects of LQ investigation in patients undergoing HD: morbidity and mortality predictors, influence of dialysis type and treatment efficiency on LQ. Patients undergoing HD have to constantly follow particular diet, restrict liquid intake, they depend on HD procedures, medical staff, additional medications, they suffer the loss of work and inability to travel, and some of them live through sexual dysfunction. Several Russian studies assessed the influence of minimal and average pulse blood pressure (BP) during HD procedure on the severity of pain syndrome [1, 2].

The works of I.A.Vasilyeva (2010) demonstrated that self-estimation of their condition of HD patients is as much important predictor of survivability as well-known clinical manifestations and laboratory test results characterizing the severity of the disease. For example, if physical functioning (PF) characteristic exceeds 56.8 points, the 5-year survivability is 69% comparing with 31% in the group where the value of this LQ parameter is less than 56.8. 6-year survivability in the patients with the values of total physical component (TPC) not higher than 34.6 is 0, whereas 6-year survivability in patients with TPC higher than 34.6 is 54% [3, 4, 5].

Several works investigated LQ correlation with the type of RRT, gender and HD duration in patients with CKD 5D stage [6, 7]. Some other articles estimated LQ in patients with AH [6, 7]. At the same time, LQ is rarely evaluated in patients with CKD 5D stage and AH. Single studies have proved the correlation be-

tween LQ, central hemodynamics and the adequacy of HD treatment [8].

Depression, associated with increased mortality, is very common in patients with terminal CKD [9, 10, 11, 12]. In particular, P. Kimmel and coauthors (2005) consider depression as the most frequent mental disorder in patients with CKD 5stage [13]. Depression frequency in HD population is high, and its comorbidity with AH is around 30%. Depressive disorders in patients with AH make treatment more complicated and can be the cause of patients' refusal of adequate antihypertensive therapy [14, 15, 16].

Thus, it is necessary to perform further LQ estimation in HD patients and to study if these deviations should undergo psychopharmacological correction.

The objective of this study was to detect the characteristics of life quality (LQ) and depression intensity in patients with arterial hypertension receiving maintenance hemodialysis treatment in the Udmurt Republic.

### **Materials and methods**

This study involved 248 patients with CKD 5D stage, among them 129/119 males/females, aged between 18 and 61 years, receiving maintenance HD treatment in HD departments of the Udmurt Republic (cities Izhevsk, Glazov, Votkinsk, Mozhga, Sarapul). 4008S ("Fresenius", Germany) and Dialog+ (B. Braun, Germany) HD apparatus was used for HD procedure that has been done 3 times per week for 4-4.5 hours each using polysulfonic dialysis membranes. The adequacy index Kt/V of urea was higher than 1.2 with the average value of  $1.43 \pm 0.09$ . All patients were divided in 3 groups of comparable age and gender. The first group consisted of 173 patients with elevated BP: 120 patients with stage I hypertension, 42 patients with stage II hypertension, and 11 patients with stage III hypertension according with the guidelines of the

World Health Organization/International Society of Hypertension (WHO/ISH, 1999, with the updates of 2003), the Russian Society of Cardiology (RSC, 2004, 2010), the European Society of Hypertension/the European Society of Cardiology (ESH/ESC, 2013). AH duration was  $13.4 \pm 1.1$  years. The second group consisted of 28 patients with normal BP (systolic BP, SBP was 100-139 mm Hg, diastolic BP, DB was 60-89 mm Hg). The third group included 47 patients with low BP (SBP 99 and less mm Hg, DBP 59 and less mm Hg). Patients with different BP had comparable age and gender.

Kidney Disease Quality of Life Short Form (KDQOL-SF™) questionnaire (R.D. Heys and coauthors, USA, 1994, Russian version by I.A. Vasilyeva, 2006) and the Beck depression inventory were used for estimation of LQ level and intensity of depression.

Statistical analysis was performed using "BioStat" v.4.03 (2009) and Microsoft Excel 2010 software. Statistical analysis involved parametric and non-parametric methods. Results are presented as  $M \pm m$ . Results' significance was proved using Student's t-test and Mann-Whitney (T) test. Correlation analysis was done using Pearson's (r) and Spearman's (rs) tests.

## Results

Patients with AH undergoing maintenance HD had low values of the following scales of the questionnaire: "Emotional wellbeing", "Emotional role restriction", "Social functioning", "Vitality". Several parameters of physical component like "Pain" and "Physical role restriction" were low in this group of patients. The level of additional scale "General perception of health" was also significantly lower comparing with the patients with normal BP (Table 2). The majority of scales reflecting specificity of kidney disorders in patients with AH were characterized with lower values. Significant difference between investigated group and comparison groups was found for the scale "Sexual function" (Table 1). Correlation analysis revealed connection between parameters of the scale "Sexual function" and renal parenchymal thickness for both kidneys:  $r = -0.75$  ( $p < 0.001$ ) and  $r = -0.84$  ( $p < 0.001$ ) for the right and left kidney, respectively.

Patients with AH had significantly lower values of such specific scales like "KS", "KDI", "CF", "SQ" (Table 1), comparing with the patients with hypotension. Patients with normal BP had higher scores in such scales like "KS" and "SIQ" comparing with the persons with low BP. At the same time, they noticed that kidney disorders influenced more their everyday

life. We did not find significant differences in scales "LA" and "DSS" (Table 2).

Comparison of obtained results in patients with different stages of AH revealed that persons with AH 3 stage had lower LQ score. In particular, significant differences have been found for specific scales ("Feeling of being burdened with CKD", "SF", "SQ") and additional scales ("GHE"). The same group was characterized with a tendency to high values of such scales like: "MSS", "DSS", "SSF", "SIQ", and "KDI". Thus, socio-psychological component was more favorable in the group of patients with AH 3 stage, and the scores of the scales reflecting severity of disease symptoms and their influence on patient's everyday functioning were significantly lower.

Patients with AH 3 stage had low scores of questionnaire's general scales like "Pf", "PRR", "GHP", "EW". These persons had a trend for low scores of the "TPC" scales comparing to high values of the "TMC" scale (Table 2).

Analysis of Beck depression inventory revealed that among the patients receiving maintenance HD, depression was present in 167 (96.5%) persons with AH, in 17 (60.7%) people with normal BP, and in 23 (48.9%) patients with hypotension (Table 3). Severe depression occurred in 16 (9.2%) patients with high BP, in 2 (7.2%) patients with normal BP, and in 3 (6.4%) patients with hypotension. Average intensity of depression in patients with AH was  $20.6 \pm 1.1$  points, the same value in patients with normal BP and hypotension was  $18.6 \pm 2.7$  and  $11.6 \pm 1.5$  points, respectively ( $p_{1-3} < 0.001$ ;  $p_{2-3} < 0.001$ ).

Depression symptoms were detected in 114 (95%) patients with AH 1 stage and in all patients with AH 2-3 stage. Subdepression was detected in 42 (35%) and 12 (28.6%) patients with AH 1 and 2 stage, respectively. Moderate and evident depression prevailed in persons with AH 1 stage, and patients with AH 2-3 stage had mostly evident and severe depression (Table 4). As it may be seen in the table, percentage of patients with severe depression increased accordingly with the stage of AH. The same pattern could be observed for average depression score:  $17.9 \pm 1.3$  for AH 1 stage,  $20.9 \pm 2.5$  for AH 2 stage,  $26 \pm 2.7$  for AH 3 stage ( $p_{1-3} = 0.0003$ ).

Correlation analysis revealed connection between depression intensity mostly with the LQ scales reflecting mental component: "ERR" ( $r = -0.74$ ;  $p < 0.001$ ), "EW" ( $r = -0.45$ ;  $p < 0.01$ ), "SOCF" ( $r = -0.37$ ;  $p < 0.01$ ). We identified correlation between the intensity of depres-

Table 1. Comparison of specific and additional scales' parameters in groups of patients with different BP levels

Scales of the KDQOL-SF™ questionnaire	AH N=173			Normal BP N=28	Hypotension N=47	p-value
	1stage N=120	2stage N=42	3stage N=11			
Kidney symptoms (KS)	56.4±3.2	56.3±4.8	45.1±7.7	73.1±2.6	66.4±2.5	p <sub>1-4</sub> =0.0000 p <sub>2-4</sub> =0.0000 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0001 p <sub>2-5</sub> =0.0002 p <sub>3-5</sub> =0.0000 p <sub>4-5</sub> =0.0032
Kidney disease impact (KDI)	47.7±3.8	52.8±3.7	57.9±7.8	49.6±5.0	62.6±14.7	p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0005 p <sub>4-5</sub> =0.0000
Feeling of being burdened with CKD	24.2±3.9	22.5±4.8	6.2±3.2	31.9±3.2	35.1±5.1	p <sub>1-4</sub> =0.0106 p <sub>2-4</sub> =0.0035 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0003 p <sub>2-5</sub> =0.0009 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0012 p <sub>2-3</sub> =0.002
Labor ability (LA)	17.3±5.5	15.0±6.6	16.6±7.5	22.2±14.6	21.8±7.8	-
Cognitive functions (CF)	72.5±4.1	63.6±5.0	61.1±12.8	81.5±4.9	83.1±3.4	p <sub>1-4</sub> =0.0186 p <sub>2-4</sub> =0.0000 p <sub>3-4</sub> =0.0012 p <sub>1-5</sub> =0.001 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0001
Quality of social interactions (SIQ)	72.6±3.1	72.6±3.5	79.6±4.5	85.9±4.8	74.6±4.1	p <sub>1-4</sub> =0.0001 p <sub>2-4</sub> =0.0000 p <sub>4-5</sub> =0.0026
Sexual functions (SF)	67.0±9.7	75.0±10.2	40.8±12.3	87.5±5.1	87.5±5.5	p <sub>1-4</sub> =0.0007 p <sub>2-4</sub> =0.0412 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0165 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0162 p <sub>2-3</sub> =0.0046
Sleep quality (SQ)	44.6±3.7	38.7±6.2	23.3±7.2	51.2±2.9	56.1±4.2	p <sub>1-4</sub> =0.0424 p <sub>2-4</sub> =0.0013 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.002 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.001 p <sub>2-3</sub> =0.0237
Feeling of social support (SSF)	62.4±5.2	68.3±5.7	77.7±12.5	74.1±5.6	79.2±4.1	p <sub>1-4</sub> =0.0163 p <sub>2-4</sub> =0.0004 p <sub>1-5</sub> =0.0001 p <sub>2-5</sub> =0.0000
Dialysis staff's support (DSS)	65±4.8	65±5.5	75±12.5	69.4±6.2	67.9±7.3	-
General perception of health (GHP)	39.2±3.2	34±4.5	16.6±3.3	50±2.1	48.1±3.7	p <sub>1-4</sub> =0.0007 p <sub>2-4</sub> =0.0000 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0009 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0000 p <sub>2-3</sub> =0.0004
Medical service satisfaction (MSS)	47.9±6.1	49.9±7.4	61.1±15.2	66.7±7.3	62.4±6.3	p <sub>1-4</sub> =0.0013 p <sub>2-4</sub> =0.002 p <sub>1-5</sub> =0.0023 p <sub>2-5</sub> =0.00101

Table 2. Comparison of general scales' parameters in groups of patients with different BP levels

Scales of the KDQOL-SF™ questionnaire	AH N=173			Normal BP N=28	Hypotension N=47	p-value
	1stage N=120	2stage N=42	3stage N=11			
Physical functioning (PF)	43.4±4.9	32.8±7.9	19.4±10.0	48.6±9.1	55.6±6.0	p <sub>2-4</sub> =0.0084 p <sub>3-4</sub> =0.0016 p <sub>1-5</sub> =0.0031 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0049
Physical role restriction (PRO)	12.9±4.8	18.3±7.6	11.1±8.4	33.3±14.1	24.5±9.8	p <sub>1-4</sub> =0.0007 p <sub>1-5</sub> =0.0134
Pain (P)	39.8±3.9	44.5±6.1	37.5±8.6	60.6±2.6	59.5±5.9	p <sub>1-4</sub> =0.0000 p <sub>2-4</sub> =0.0001 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0011 p <sub>3-5</sub> =0.0059
General health evaluation (GHE)	30.9±2.8	20.7±5.2	11.6±6.0	39.4±3.2	38.5±4.1	p <sub>1-4</sub> =0.0028 p <sub>2-4</sub> =0.0000 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0028 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0001
Emotional wellbeing (EW)	53.2±3.8	38.2±6.8	28.0±9.6	64.8±6.2	66.3±6.5	p <sub>1-4</sub> =0.0031 p <sub>2-4</sub> =0.0000 p <sub>3-4</sub> =0.0000 p <sub>1-5</sub> =0.0003 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0000 p <sub>1-3</sub> =0.0002
Emotional role restriction (ERR)	19.4±5.6	30±8.5	33.3±13.2	66.6±16.6	60.4±9.7	p <sub>1-4</sub> =0.0000 p <sub>2-4</sub> =0.0014 p <sub>3-4</sub> =0.0284 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0003 p <sub>3-5</sub> =0.0286
Social functioning (SOCF)	50.8±5.3	53.7±6.4	58.3±8.3	68.1±5.6	72.6±5.2	p <sub>1-4</sub> =0.0011 p <sub>2-4</sub> =0.0008 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0228
Vitality (V)	38.9±3.3	38.8±3.7	41.6±3.3	51.1±5.7	54.5±2.9	p <sub>1-4</sub> =0.0007 p <sub>2-4</sub> =0.0003 p <sub>3-4</sub> =0.0497 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0004
Total physical component (TPC)	33.1±1.6	32.9±4.2	30.6±5.3	35.2±0.8	35.2±2.1	p <sub>3-4</sub> =0.0081
Total mental component (TMC)	37.8±2.1	36.6±5.2	40.4±4.0	44.4±5.1	49.5±2.2	p <sub>1-4</sub> =0.0014 p <sub>2-4</sub> =0.0079 p <sub>1-5</sub> =0.0000 p <sub>2-5</sub> =0.0000 p <sub>3-5</sub> =0.0012 p <sub>4-5</sub> =0.0389

sion and physical component's scales" "P" (r=-0.56; p<0.01), PF (r=-0.34; p<0.01), that by itself proves the presence of several factors promoting the development of depression, as external ones (social, psychological, emotional), as internal ones (rough pathophysiological deviance). Specific scales like "KS" (r=-0.4; p<0.01), "Feeling of being burdened with CKD" (r=-0.67; p<0.001), "KDI" (r=-0.62; p<0.001), "CF" (r=-0.6; p<0.001), "SQ" (r=-0.4; p<0.01), "SF" (r=-0.5; p<0.001), "SSF" (r=-0.35; p<0.01; Table 4). There was

no significant correlation between depression and additional LQ scales: "MSS" (r=-0.15; p>0.05), "DSS" (r=-0.1; p>0.05), "GHP" (r=-0.2; p>0.05).

## Discussion

This study demonstrated that all patients with AH, independently on its stage, had significant reduction of specific and general LQ scales reflecting prevalently mental component (p<0.001). Thus, these patients had the symptoms of neurotic disorders, tiredness,

Table 3. Severity of depression in patients with CKD with different BP levels

Depression intensity	High BP N=173 Persons (%)	Normal N=28 Persons (%)	Arterial hypotension N=47 Persons (%)	p-value
Absence	6(3.5)	11(39.3)	24(51.1)	$p_{1-2}<0.0001$ $p_{1-3}<0.0001$ $p_{2-3}>0.05$
Subdepression	54(31.2)	4(14.3)	8(17.0)	$p_{1-2}>0.05$ $p_{1-3}>0.05$ $p_{2-3}>0.05$
Moderate	43(24.9)	4(14.3)	2(4.3)	$p_{1-2}>0.05$ $p_{1-3}<0.01$ $p_{2-3}>0.05$
Evident	54(31.2)	7(25.0)	10(21.2)	$p_{1-2}>0.05$ $p_{1-3}>0.05$ $p_{2-3}>0.05$
Severe	16(9.2)	2(7.1)	3(6.4)	$p_{1-2}>0.05$ $p_{1-3}>0.05$ $p_{2-3}>0.05$

Comment: p – significance of differences between the groups according with the Pearson's chi-squared test.

Table 4. Depression intensity in patients with CKD 5D stage combined with AH of different stages

Depression intensity	AH 1 stage N=120 patients (%)	AH 2 stage N=42 patients (%)	AH 3 stage N=11 patients (%)	p-value
Absence	6(5)	0(0)	0(0)	$p_{1-2}>0,05$ $p_{1-3}>0,05$ $p_{2-3} -$
Subdepression	42(35)	12(28,6)	0(0)	$p_{1-2}>0,05$ $p_{1-3}<0,05$ $p_{2-3}<0,05$
Moderate	35(29,1)	6(14,3)	2(18,2)	$p_{1-2}>0,05$ $p_{1-3}>0,05$ $p_{2-3}>0,05$
Evident	32(26,7)	16(38,1)	6(54,5)	$p_{1-2}>0,05$ $p_{1-3}>0,05$ $p_{2-3}>0,05$
Severe	5(4,2)	8(19,0)	3(27,3)	$p_{1-2}<0,01$ $p_{1-3}<0,01$ $p_{2-3}>0,05$

Comment: p – significance of differences between the groups according with the Pearson's chi-squared test.

sorrow, emotional exhaustion and did not have “the feeling of happiness”. This group of patients had low scores both of physical component scales like “P” and “PRR” ( $p<0.01$ ), that can indicate significant restriction of physical exercises in everyday life, in particular, osteodystrophy and related to it pain syndrome, the presence of chronic inflammation (polyneuropathy). Patients with AH reported stronger impact of kidney disorders on social functioning related to the necessity to follow a diet and reduce liquid intake, the inability to do house duties, and disease's influence on appearance or social functioning. Significant difference between the studied group and normal BP and hypotension groups was found for the “SF” scale ( $p<0.001$ ). The questionnaire reflects subjective evaluation by patient, but it does not reduce the significance of this scale that can correspond to the

intensity of erectile dysfunction. According with several authors, erectile dysfunction is a sign of severity of endothelial dysfunction in cavernous bodies and may be considered as cardiovascular complications risk factor [17.18.19], that was proved in our study by strong correlation between “SF” scale and renal parenchymal thickness ( $p<0.001$ ). In our study patients with AH related low social support including friends and family, at the same time perception of dialysis staff's psychological support was comparable with the groups of normal and low BP.

Comparison of the results obtained in patients with AH of different stages revealed that patients with AH 3 stage had lower LQ scores. This reduction was present for scales reflecting physical component and symptoms including the “SF” scale. Patients reported that kidney disorders prevented them from living

normal life, took much time and made them feel as a burden for their families. CKD complications like cramps, skin itch, numbness of hands and feet, chest pain, reduced sleep quality become more evident in higher stages of AH.

In the Udmurt Republic depression is a common mental disorder in patients with AH undergoing maintenance HD (96.5%). Occurrence and intensity of depression symptoms increased accordingly with AH stage ( $p < 0.05$ ). It may be caused by crossing mechanisms of AH and depression pathogenesis, in particular, by hyperactivation of sympathetic nervous system and activation of thalamo-pituitary-adrenal system [20, 21].

Correlation analysis revealed connection between depression intensity and LQ scales, mostly with the ones reflecting mental component ( $p < 0.01$ ), that proves the presence of external (social, psychological, emotional) and internal (rough pathophysiological deviance) factors promoting the development of depression [22]. The presence of significant correlation demonstrates burdening influence of depression on LQ parameters. Since depression intensity has no correlation with the scales "MSS" and "DSS", professional psychological help is required in this category of patients. Taking into account prevalence and intensity of depression in patients undergoing maintenance HD that is aggravated in case of AH, not only psychotherapeutic but also psychopharmacological support may be required in these patients. Unfortunately, nowadays there are no psychotherapists in HD departments of the Udmurt Republic.

Reduction of LQ characteristics and more severe depression in patients with AH undergoing maintenance HD increases the risk of unfavorable cardiovascular complications.

## Conclusion

Taking into account all mentioned above facts, we can conclude that patients with AH undergoing maintenance HD had reduced LQ according with all scales of the questionnaire, mostly because of the mental component. Patients with AH 3 stage had low scores of the scales reflecting the severity of disease symptoms and physical component. Patients with AH have higher risk of developing depression. Intensity of depression symptoms increases with the increase of AH stage. Due to this it is necessary not only to correct BP levels in patients with AH undergoing HD, but also give these patients necessary psychological support and/or psychopharmacological treatment.

**Conflict of interest:** None declared.

## References

- Hedlin G. E., Shilo V. Y., Siva M. V. et al. 'Assessment of the severity of "cardiac" complaints in patients with ESRD receiving renal replacement therapy hemodialysis. *Nephrology and dialysis*. 2008; 10(3-4): 208-213. Russian
- Dobronravov V. A., Vasiliev I. A. Quality of life, depression and anxiety in patients on renal replacement therapy. *Bulletin of the National medico-surgical Center named. N. And. Pirogov*. 2015; 10(3):115. Russian
- Vasileva I. A. peculiarities of quality of life in patients with chronic renal failure in the treatment of hemodialysis. *Izvestia of Russian state pedagogical University. A. I. Herzen*. 2008;57:75-86. Russian
- Bayoumi M., Wakeel J. Al, Harbi Al A. Predictors of quality of life in hemodialysis patients. Self-learning package for hemodialysis patients, Saudi Arabia. / <http://faculty.ksu.edu.sa/73577Pages/PredictorsofQualityofLifeinHemodialysispatients.aspx>
- Kalantar-Zadeh K., Kopple J. D., Block G., Humphreys M. H. Association Among SF36 Quality of Life Measures and Nutrition, Hospitalisation, and Mortality in Hemodialysis. *J. Am. Soc. Nephrol*. 2001; 12: 2797-2806.
- Balanova, Y. A., kontsevaya A. V., shalnova S. A., et al. The quality of life of persons with arterial hypertension in Russia - is there a connection with the status of the treatment? (according to population studies of the esse-RF). *Russian journal of cardiology*. 2016; 9 (137): 7-13. Russian
- Dmitriev A. V., Kildibekova R. N., Ishmetov Y. S. et al. Effect of antihypertensive therapy on the quality of life of patients on hemodialysis suffering from nephrogenic hypertension. *Nephrology and dialysis*. 2003; 5 (1): 59-64. Russian
- Chepurina N. G. Kretov M. A. evaluation of the effect of Kardos on the clinical course of chronic heart failure in patients with chronic kidney disease V stage that are on hemodialysis. *Saratov journal of medical scientific*. 2011; 7(2): 422-426. Russian
- Burdein, E. V. Depression in patients with CKD V GD/GDF. *Proceedings of the IV Congress of Association of nephrologists of new independent States (Minsk)*. 2016: 65-66. Russian
- Ibrahim N., Chiew-Thong N.K., Desa A., Razali R. Depression and coping in adults undergoing dialysis for end-stage renal disease. *Asia-Pacific Psychiatry*. 2013;5(Suppl 1):35-40.
- McKercher C., Sanderson K., Jose M.D. Psychosocial factors in people with chronic kidney disease prior to renal replacement therapy. *Nephrology (Carlton, Vic)*. 2013;18(9):585-591.
- Park H.C., Lee H., Lee J.P. et al. Lower residual renal function is a risk factor for depression and impaired health related quality of life in Korean peritoneal dialysis patients. *J Korean Med Sci*. 2012; 27(1):64-71.

13. Kimmel, P.L., Peterson R.A. Depression in end-stage renal disease patients treated with hemodialysis: tools, correlates, outcomes, and needs. *Semin Dial.* 2005; 18(2): 91–97.
14. Gerasimchuk, Y. M. Method of evaluation of quality of life and depression as the criterion of the effectiveness of pharmacotherapy. *Bulletin of the National medico-surgical Center named. N. And. Pirogov.* 2015; 10(3):26-27. Russian
15. Sidorov P. I., Solovyev A. G., Novikova I. A. personality Characteristics in patients with arterial hypertension and their dependence on the severity of the disease. *Mental health.* 2007;2:35-40. Russian
16. Viktorova I. A., Lisnyak, M. V., Trukhan D. I. to optimize the management of anxious patients with hypertension: focus on non-pharmacological methods. *International journal of heart and vascular diseases.* 2016; 4(12): 44-51. Russian
17. Kalinichenko S. Y., Tuzikov I. A., Gusakova, D. A. Vitamin D as a new steroidnyi hormone and its importance for men's health. *Effective pharmacotherapy.* 2015;27: 38-44. Russian
18. Lunenfeld B., Masala G. J., Zisman M. et al. Guidelines for the diagnosis, treatment and monitoring of hypogonadism in men. *Effective pharmacotherapy.* 2015;27:6-20. Russian
19. Neimark A. I., Neimark B. A., Tischenko G. E. Option correction of stress-induced erectile dysfunction in patients with arterial hypertension. *Experimental and clinical urology.* 2012;4:58-62. Russian
20. Czira M.E., Lindner A.V., Szeifert L. et al Association between the Malnutrition-Inflammation Score and depressive symptoms in kidney transplanted patients. *Gen Hosp Psychiatry.* 2011;33(2):157–165.
21. Zawadka B., Byrczek M., Zawadzka S. Temporal perspective and other psychological factors making it difficult to adapt to requirements of treatment in chronic dialysis patients. *Psychiatr. Pol.* 2014;48(5): 961-974.
22. Tessa O., Beukel V., Siegert C. E.H. et al Comparison of the SF-36 Five-item Mental Health Inventory and Beck Depression Inventory for the screening of depressive symptoms in chronic dialysis patients. *Nephrol Dial Transplant.* 2012; 27: 4453–4457.