

# Dynamics of cognitive and emotional disturbances in patients with chronic kidney disease

## Abstract

The article discusses the psychological problems of relationships between chronic kidney disease (CKD) and cognitive and emotional disturbances emerging in patients. Three groups of patients with chronic kidney disease at different stages were selected: the patients with the initial stage of the disease, the patients with the CKD itself, and the patients undergoing hemodialysis and on the waiting list for a kidney transplant and the patients with a transplanted kidney. A clinical-psychological study was conducted on 120 patients, male and female, age ranges from 28 to 60 years (the median age of  $40.7 \pm 13$ ), with 40 patients in each group respectively. The authors investigated the hypothesis that there are significant differences in the internal picture of illness in the patients with the progression of chronic kidney disease, with regard to the disease and self-esteem.

**Keywords:** chronic kidney disease, cognitive and emotional disturbances, internal picture of illness

Volume 9 Issue 1 - 2018

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**Received:** December 14, 2018 | **Published:** February 20, 2018

## Introduction

In today's world, chronic kidney disease is one of the most significant health and socio-economic problems. The prevalence of the disease, according to different sources, is 5-16% in the general population in different countries. Every year, there is an increasing number of registered patients with end stage renal disease (ESRD). According to statistical data in the Russian Federation, in the year 2002 were registered 29 thousand patients with ESRD, and in 2014 were registered more than 67 thousand people. Therefore, increasing number of patients requires renal replacement therapy, such as hemodialysis and allograft transplantation. More than 10-13% of the adult population in the Russian Federation suffers from chronic kidney disease, and a disease is not only "getting younger", but is also increases mortality. Identification of CKD often occurs on early stage. Life style modifications, changes in nutrition, and medical treatment may help to slow the progression of the disease. But particularly at risk, as well as other "silent killers" – diabetes mellitus and arterial hypertension – is that a long time complains that would encourage timely consult your doctor and start treatment, patients may not occur. Disease is diagnosed more often already in the terminal stage, with the subsequent formation of a fistula and the beginning of the procedure of dialysis. Chronic kidney disease is a multifaceted problem that has both physical and psychological implications to patient. Renal disease and replacing the work of kidneys with dialysis or their transplantation, as any chronic somatic disease, is a particular case of a difficult situation that overloads the mental control system.<sup>1-3</sup> This situation entails changes in the functioning of emotional, motivational and cognitive spheres, both in the vital and functional aspects. So far, there are no enough studies of psychological characteristics of patients in different stages of kidney disease. A study of the personality characteristics of chronic patients currently takes a priority in clinical psychology. It is known that patients with irreversible, progressive disease develop cognitive and emotional disturbances, primarily due

to changes in living conditions, marital status, activity, interests and professional status. Simultaneously with mood disturbances, focus of behavioral activity and the system of values, reduced self-esteem and a distorted internal picture of the disease (IPD) would develop.

According to the concept of «internal picture of the disease» developed by Moscow School of Clinical Psychology, human disease is associated with a variety of experiences stemming from representation of the disease (knowledge about a disease and rational estimation of the disease) and immediate emotional reactions for the consequences of the disease in life.<sup>4,5</sup> Thus, IPD represents a complex that in some cases may complicate the course of illness, allow the success of the treatment or slow the progress of rehabilitation process.

Important dispositional factors shaping the cognitive and emotional component of IPD in patients with chronic kidney disease are growing severity of somatic pathology, the duration of treatment procedures, increased reliance on medical equipment and staff; changing style and deterioration of relationships in a family. These symptoms are particularly prominent in patients with end stage renal disease. Beside, the patients with chronic kidney disease often have unusual psychological problems requiring different methods of treatment depending on the individual psychological characteristics of patients. The range of pathological reaction manifests in a wide variety of anxious and depressive symptoms, often involving suicidal ideation.<sup>6-11</sup> The purpose of the article is to discuss psychological problems in patients with chronic kidney illness at different stages of the disease as result of changes in the biological functioning of their organism.

## Material and methods

The main studies were carried out by the Head Doctor of the Dialysis Center, S.V. Zakharov, in Ural Medical Center in Yekaterinburg and by Head Doctor Professor F.I. Badaev in the

Sverdlovsk Regional Clinical Hospital No. 1 in Yekaterinburg. The examined group included 120 patients (60 men and 60 women), aged from 28 to 60, the average age of the patients being 40.7, plus-minus 13 years. Respectively, 40 patients in each group were chosen: the initial stage of the disease, the stage rendering the CKD in patients receiving hemodialysis in the waiting list for a transplant of a kidney and patients with a transplanted kidney. Selection of patients was conducted on a voluntary basis, in accordance with the principles of medical ethics and deontology. The patient groups were equalized by age, level of education and social status. The validity and reliability of the data obtained provided methodological justification for the study and implementation of the set of complementary and psychological techniques, for the adequate study aims, for the representativeness of the sample of the combination of quantitative and qualitative analysis of evaluation results, for the statistical processing of the results with the help of the statistical program package "Microsoft Excel". The program of statistic processing of SPSS was used for solving the problems of correlation analysis. The following selected clinical and psychological methods were used to achieve the results: observation; clinical and psychological interviews; the Beck Anxiety Inventory & Beck Depression Inventory; the Toronto Alexithymia Scale (TAS); the "Tobol" Questionnaire developed by the laboratory of the Institute of Medical Psychology named after V.M. Bekhterev, version 2005; the method "Self-Esteem" T. Dembo – S.Y. Rubinstein, modified version with "individual scale".

## Results

The article continues a series of earlier publications on the problems of psychological rehabilitation of patients with transplanted solid

organs (heart, kidneys, liver) and on studies of patients on hemodialysis with the terminal stage of chronic kidney failure.<sup>12-14</sup> However, this article differs in that it traces the dynamics of emotional and cognitive disturbances in patients with chronic kidney disease in various stages of incurable progressive illness. A general clinical characteristic of the group is given in Table 1. The social and professional status of the patients has the following peculiarities. Most of the patients are married; among the patients of the first group it is 28 persons (70%); among the patients of the second group – 23 persons (57.5%); in the third group – 21 persons (52.5%). Most of the examined patients have a higher education – in all the three groups it is from 74% to 69.5%. As for employment there is a great diversity among the patients of the 1st and the 2nd groups. Most of the patients in the 1st group – 32 persons (80%) work a full day or are self-employed. At the same time many patients in the 2nd group don't work at all – 24 persons (60%); only 8 (20%) of them are permanently employed, the other 20% work part-time or from time to time. Such a large number of unemployed people among dialyzed patients is conditioned by situational factors – the complicated situation of dialysis therapy. Transplantation patients live with the transplanted kidney, on average, from one to ten years. It should be added that earlier, that is before transplantation, all patients had been subject to dialysis therapy for one to a few years. The fact that many patients do not have a family and a full-time permanent job can, to a certain degree, explain their social instability that is accompanied by an incurable progressive illness. It must be noted here that of all the psychological variables that influence the ability of the individual to cope with the stress, social support is the most important (parents, spouses, friends, colleagues, etc.).

**Table 1** Clinical characteristic of patients with chronic kidney disease included in the study (N=120)

Clinical characteristics	Groups of patients		
	Group 1 (N=40)	Group 2 (N=40)	Group 3 (N=40)
Stage of CKD (K/DOQI 2002)	2-3	4-5	
Glomerular Filtration Rate (GFR) (ml/min)	90-60	30-15 and lower	Patients with Transplanted Kidney
Characteristic of Kidney Function	Injury of kidney initial fall of GFR (Study and Conservative Treatment)	Marked Fall of GFR, Terminal Kidney Failure Substitution Therapy for Transplantation	

The results of the level of depression diagnostics according to the "Beck Anxiety Inventory & Beck Depression Inventory" method show that the depression index above the norm is characteristic of patients in the 2nd and 3rd groups. Thus, 26 (65%) patients on hemodialysis experience a slight depression which shows itself in their depressed state, in their anxiety, irritability, low self-esteem, lack of interest in other people, though these people can fully carry on their habitual activity if they don't pay attention to their condition. Those five (12.5%) patients who have been on hemodialysis less than five years, experience a medium and moderate depression, which shows that they have not yet formed a way of adapting to their condition. One of the female patients, aged 60, dialyzed for 15 years, is experiencing a heavy depression accompanied by possible delirious ideas (self-deprecation, sense of guilt), hallucinations, and suicidal intentions. According to the data received, the anxiety and depression symptoms are experienced by all patients in the 3rd group. Not a single patient had a normal anxiety index, that is, up to 21 points included. Thirteen patients (11.6%) showed a high anxiety index equal to 36-41 points, the others were within the limits of 25-32. The average anxiety index was  $23.58 \pm 4.01$  ( $p < 0.05$ ). The self-appraisal of a patient with chronic kidney disease is the most significant factor characterizing the personality of the patient, a cognitive diagram that summarizes his/her past experience and one that structures the new information about the

person and his/her future. Self-appraisal is accompanied by emotional reactions and affective hesitations, which, in the long run, determine the treatment and its results and, on the contrary, lead to anxiety, depression and suicidal thoughts. The method of "Self-Esteem" with its four standard scales: thought, character, happiness, health and the individual scale helped us to see the differences between the patients studied in the three groups. The medium real self-esteem of the patients in the 1st group was 7.22 (out of 10), which means it was adequately high. To note, 23 patients (57.5%) with a high self-esteem have high level claims. In this case, the individual scale includes "Family", "Work", "Success" and "Well-being". The integral self-esteem of patients in the second group is lower – 5.80. The difference between the two groups on the integral level of self-esteem is  $p < 0.01$ . The difference is determined by much lower values ( $p < 0.01$ ) in patients of the second group on the scale "Health", "Happiness" and the Individual Scale. The Individual Scale is broken up into "Well-being", "Stability", and "Money". Only 4 patients (10%) point to scale "Family" and "Work". Most of the patients in this group experience an unstable self-esteem, one that is much higher on the "Happiness" scale and lower on the "Health" one. This disposition of scales points to the compensatory reaction of the patients with a partial lowering of critical attitudes and an attempt to conceal their negative emotions from themselves and from other people. Together with an integral

high self-esteem other patients show a rise of the actual self-esteem on the scale "Health", which shows that they have a more defective mechanism of psychological protection, that is, the mechanism of negation. In interviews these patients do not consider themselves as having problems with health. When asked to explain the high mark on this scale, they say, "My hands and feet are all there". In the group that has undergone transplantation, most of the patients – 32 (80%), have an even lower integral self-esteem – 5.2, with unbalanced indices on the scales (thought, character, happiness, health and individual scale). All these patients are concentrated on their somatic problems, those that forced them to undergo transplantation. Only a few of them are happy, some experienced euphoria right after the operation and when they were allowed to go home it turned into anxiety caused by the necessity to follow all the medical recommendations. On an additional (individual) scale that contains special characteristics for them, these patients showed that they lacked persistence, sober-mindedness, responsibility, tolerance, discipline, pliability and other qualities, not one of which guarantees the patient happiness or health as an index of a higher quality of life in the post-operative period. The method of the "Toronto Alexitimia Scale (TAS)" was used to show the level of alexitimia. Most of the patients of the 1st group (92.5%), of all ages and both sexes, showed the TAS as being  $59.3 \pm 1.3$  (with theoretical distribution of results from 26 to 130), a fact that is characteristic for non-alexitimia patients with constructive fantasies colored by desires that they hope to realize. At the same time, more than half the patients of the 2nd group showed alexitimia – 23 (57.5%) persons; TAS =  $72.09 \pm 1.4$ . More than 30% patients are in the risk group. No gender differentiations here. The fact that most of the patients experience alexitimia makes it possible for us to say that they are not ready to adequately accept and undergo the traumatic situation. However, the non-acceptance of negative emotions very often leads to the non-acceptance of possible happiness. These patients are the ones who more often than not experience depression. Alexitimia as such shows that these patients are not able to accept anything new and are centered only on negative events. Personality disturbances in patients with alexitimia lead to inability to reflect, to simplification of their life, to impoverishment of their connections with the surrounding world. The difference between the two groups is clear ( $p < 0.01$ ). Difficulty in communication was accompanied by typical peculiarities of the non-verbal behavior of the patients with alexitimia. Thirty-eight patients showed a non-dynamic, stiff expression of face. At the start of the interview, 27 (67.5%) patients began to cry: 18 (90%) of the females and 7 (35%) of the males. Thirteen (65%) patients could not explain why tears had appeared, 7 (17.5%) said that they were not satisfied with their physical state, 7 (35%) insisted that it was a specific feature of their eyes, something that had appeared after the operation. These patients smiled a short smile only when their family was mentioned. Almost half of the patients (47.5%) laughed when they spoke in an exaggerated way about their personality or about their health. Short-lived, but very sharply expressed in their behavior affective reactions appeared easily, not all of them corresponding to the content, in contrast to their low emotional differentiations of which the patients were not really conscious of. The level of alexitimia for patients with transplanted kidney is close to the upper norm and is equal to  $61.1 \pm 1.4$ , which is, on the whole, characteristic of patients with chronic somatic disease at the stage of internal stabilization of the illness, when they see preservation of their health and control of their condition as the most important thing.

The attitude of the patients with chronic kidney disease to their illness was studied with the help of the TOBOL (type of attitude to illness) method. Generally speaking, the data received has shown that the patients of all three groups experience over-compensatory

attitude to their disease in three different ways: ergopathic with patients of the 1st group, anosognosic with the 2nd group and the 3rd group. The attitude of the patients of the first group to their illness includes signs of melancholic and sensitive variants, in the second and third groups it is egocentric and apathetic. In addition to that, 8 (20%) patients of the 3rd group manifest an ergo pathetic type of attitude to their illness. These patients demonstrate an over-responsible, almost obsessive attitude to their work, expressed to a greater degree than before the illness. In some cases, this ergo pathetic may form a selective attitude to examinations and treatment, stipulated, first of all, by a desire to continue working, in spite of the serious illness. However, the anosognosic type of attitude to illness is, to a greater degree, characteristic for patients on hemodialysis – 25 (62.5%). Being unable to assess the meaning and significance of the illness and not being able to form any idea about its dynamics within the context of their vital activity, these patients avoid any reflections on it and prefer to deny its existence altogether. The anosognosic type of illness makes the patients think that their illness was caused by accidental circumstances. They refuse to follow the doctor's recommendations; they prefer to treat themselves; they are thoughtless and careless about their illness and treatment. The distribution of patients in this group according to dominating types of attitude towards illness shows that there is a pre-dominance of the "pure" (isolated) types: anosognosic, ergo pathetic and harmonic (62.5%, 20%, 10%). The other pure types (sensitive, anxious, melancholic) are quite rare. We must note here that the mixed type of attitude to illness for patients of the 2nd group is 12% against 47% for patients of the 1st group who undergo observation and conservative treatment. Analysis of distribution of the variants of attitudes to illness according to the criteria of "preservation/disturbance of psychic adaptation", carried out with the help of the algorithm method suggested by the author, shows that disturbance of psychic adaptation is seen in 42.5% of the patients of the 1st group (mainly by the intrapsychic type); 60.8% of the patients of the 2nd group (signs of disturbances of the mixed inter- and intrapsychic variants) and 47.5% of the patients of the 3rd group. The results received correspond to the data found in literature,<sup>15</sup> according to which the disruption of psychic adaptation is a typical phenomenon for patients with chronic kidney disease.

## Discussion

On the basis of the results obtained it turned out, that patients with chronic kidney disease experience cognitive and emotional disturbances during the whole illness: from the moment it was diagnosed to transplantation of the kidney. It is necessary to note here, first of all, that these patients experience psychic and neurologic disturbances of a great variety. As the somatic condition becomes more complicated the polymorphism of psychic disturbances becomes less. They appear due to uremic intoxications, to vascular and metabolic disruptions, possibly, due to organic changes in the brain. During treatment, especially hemodialysis (for patients of the 2nd group), the psychic disturbances undergo a whole row of changes. A better somatic condition (lessening of intoxication and its harmful effect on the brain) brings to the fore other aspects of the illness – its psycho-traumatic influence, worsening of the quality of life and clearly-felt social and professional limitations. The asthenic state creates favorable conditions for the formation of psychogenic reactions, mostly of a depressive nature.

Patients undergoing conservative treatment (the 1st group) experience an emotional level which, on the one hand, is determined by their complaints about their condition as a whole (weakness, nausea, headache, skin itching, etc.), on the other, by their anxious

expectation of treatment and fear of it. Here the level of alexitimia is within the norm which points to the fact that the patients retain their ability to identify and describe their emotions, for which there are both external and internal reasons. At the same time, the patients get tired of staying in hospital, they don't like the surroundings. These patients don't see themselves as being ill. In most cases, they have a high adequate self-esteem with high claims. Patients of this group demonstrate stability as far as their former purposes in life were concerned, for the realization of which they must become healthy, so they put off hemodialysis as long as they can. Most probably, this points to disruptions of psychic adaptations of the intra-psychic type. The over-compensatory attitude to their illness is expressed in the prevalence of the ergo pathetic and the mixed type. In the process of intensification of treatment, the patients start to discuss the possibility of returning to their professional activity. They speak of their plans and intentions, their attitude to doctors and the medical staff in general is full of positive emotions. Most patients err in that they expect better results. The results of analysis which become better in the process of treatment, as does the state of their health, are now the main criteria. The emotional level of patients changes greatly during the process of chronic treatment (the second group). The depression indices are higher than normal with most patients. They become irritable, are often depressed and anxious. Many patients of this group have a low and unstable self-esteem, a partial lowering of critical attitude; they experience ineffective mechanisms of psychological protection of a low level. More than half the patients show alexitimia which is characterized as being secondary, that is a state formed in the process of a chronic incurable illness. An over-compensatory attitude to the illness is demonstrated in the prevalence of the "pure" variant – the anosognosic type of attitude of the inter- and intra-psychic variant. A significant part of the patients now see themselves as being ill, they collect information about their illness, about the successes and failures of the outcome. The decisive role here is played by the pre-morbid peculiarities of the patient's personality. The impossibility to realize former aims leads to the fact that the idea of "keeping in good health" that was born at the onset of the illness now becomes a leading motive that determines all behavior and style of life in general. The same significant cognitive and emotional disturbances that were experienced by patients with a transplanted kidney (3rd group) are seen here. To a great degree, it is determined by the fact that they do not make the decision of being put on the waiting list themselves. It is done under the influence of the doctor or relatives. The patients are over-loaded with medical information and they start expecting too much already in the pre-operative period. Moreover, the psychological state of patients who had undergone hemodialysis for long periods is characterized by three main stress characteristics: dependence on long therapeutic programs forced upon them; a state of uncertainty as far as life expectations are concerned; limitation of outdoor activity in the family circle, as well as professionally and socially. The long hemodialysis therapy makes the patients think that after the operation they will lead an active life and will not depend on drugs and treatment, a fact which turns out to be illusory. As a result these patients are not prepared psychologically, even if the operation is successful and the transplant has been correctly chosen, to accept that their working capacity and the quality of the life that they had prior to the illness, cannot be fully restored in a short period of time, that they will have to be under the observation of a doctor for a constant and long period of time. The patients experience fear that the transplant can be rejected and potentially hemodialysis therapy will be renewed. At the same time, more than half of the patients say that if it becomes obvious that the transplant is rejected, they are prepared for a re-transplantation.

## Conclusion

In this paper dynamics of cognitive and emotional disorders in patients with chronic kidney disease presented data held in clinical psychological diagnosis. To discuss the results of the research shows that there are significant differences on various parameters of cognitive and emotional sphere between patients, consolidated into three groups depending on the stage of the disease. All this underlines the need for the involvement of clinical psychologist at all stages of the process of treatment and rehabilitation of patients with chronic kidney disease.

## Acknowledgments

We thank all patients, colleagues, nurses who participated in the study, as well as hospital management for the opportunity to undertake a study.

## Conflicts of interest

The author state that there are no conflicts regarding research, copyright and publishing this article.

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