
Original article

Are Depression and Anxiety Common in Hemodialyzed Patients?

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Abstract

Researchers confirmed that depression and anxiety are two common comorbid disorders in chronic kidney patients.

The aim of our study was to screen the level of depression and anxiety in a group of end-stage kidney diseases treated with hemodialysis.

The evaluated sample comprised 230 participants; 110 females (mean age 55.5 ± 13.5 years), and 120 males (mean age 54.5 ± 14.3 years). The mean duration of maintenance dialysis was 8.3 ± 5.8 years (from 0.5 to 24 years). Patients were selected randomly from three dialysis centers in R. Macedonia.

As psychometric instruments Beck Depression Inventory (BDI) and scores from Minnesota Multiphasic Personality Inventory (MMPI-201) were used.

Our study confirmed that majority of evaluated dialyzed patients are depressed and anxious in different level, but unfortunately the mental problems are frequently unrecognized.

We suggested some response measures for management of these conditions in order to avoid risks for complications as well of suicide.

Keywords: dialysis, depression, anxiety, management

Introduction

Depression has been called "the common cold" of mental health because epidemiological data shows an enormous percentage of affected population worldwide.

In the report about global World Health in 2008 it was pointed that depression has a greater effect on overall health than angina, arthritis, asthma or diabetes. The World Health Organization (WHO) has ranked depression the 4th leading cause of disability and projects that by 2020, it will be the second leading cause [28,24-27].

The WHO World Mental Health (WMH) Survey Initiative estimate in evaluated 18 countries the percentage of depression in general population to be ranged from 2.2% (Japan) to 10.4% (Brazil) [26].

Depression can have many causes. In the case of someone who has just been diagnosed with chronic kid-

ney disease there may be a lot of information to process about the physical health, which could lead to strong emotions about the life and how it may change. Similarly, once a person reaches end-stage renal disease and begins dialysis, there are lifestyle adjustments to be made that could bring up feelings of despair. Many times these feelings are only temporary, but depression can also be persistent and severe. The core rule worldwide is that when depression is diagnosed in any person, especially in chronic ill one, the psychiatric/psychological help is inevitable. On the other side, just because someone has kidney disease, or end-stage renal failure, doesn't mean he will obligatory experience depression [2,3,6-9,13].

Searching for depression in end-stage renal diseases, only in Medline we could find more than 1400 articles devoted to this issue, especially when the hemodialysis is used as maintenance therapy.

Depression can be described as being composed of two components: an affective (mood) one and a physical (somatic) one (e.g., loss of appetite, fatigue). In participants with concomitant physical illness like chronic renal failure, the reliance on physical symptoms may artificially inflate scores obtained on psychometric questionnaires due to symptoms of illness, rather than those of depression. For this reason, there are several precautions that must be taken into account when interpreting the results.

The gold standard for diagnosis depression are clinical signs described in DSM-V and scores obtained with psychometric instruments. In the DSM-V, depressive disorders are classified in three subtypes: major depression, persistent depressive disorder, depressive disorder NOS (not otherwise specified), while minor depression is classified in the group of NOS depressive disorder. Symptoms of depression include feelings of worthlessness or guilt, diminished ability to think, concentrate or make decisions, weight loss, insomnia or hypersomnia, psychomotor agitation or retardation, and recurrent suicidal ideation. As psychometric instruments the most frequently used are: Hamilton scale (HAM-D), Zung Self-Rating Depression Scale, Montgomery-Asberg Depression Rating Scale, Geriatric Depression Scale, Beck Depression Inventory etc. Except the HAM-D (used by professionals), which was developed as a measure of treat-

ment outcome rather than a screening or diagnostic tool for depression, all others are based on self-reports [10,17,18]. The most frequently used self-report measures for depression are Beck Depression Inventory I and II, Center for Epidemiologic Studies Depression Scale, Geriatric Depression Scale, Hospital Anxiety and Depression Scale, and Patient Health Questionnaire-9. Some of these measures have become integrated into routine clinical practice (as screening tools) in large managed-care organizations. Anxiety is characterized by many symptoms such as: feelings of panic, fear, and uneasiness, problems sleeping, cold or sweaty hands or feet, shortness of breath, heart palpitations, not being able to be still and calm, dry mouth, numbness or tingling in the hands or feet, nausea, muscle tension, dizziness etc. There are several forms of anxiety: panic attack, social phobia, generalized anxiety disorder or specific phobias.

Anxiety disorders may be caused by problems in the functioning of brain circuits that regulate fear and other emotions, but the exact cause of anxiety is still not known. Certain environmental factors, such as a trauma or significant event, may trigger an anxiety disorder in people who have an inherited susceptibility to developing the disorder. Anxiety disorders are highly prevalent in the general population, comprising 7-8% of patients seen in a primary care settings, or approximately 40 million adult only in USA. There are significant overlap in symptomatology between depression and anxiety disorders and these two conditions often simultaneously coexist in hemodialyzed patients [6,9,28].

Anxiety and depression may complicate the treatment of any medical condition, especially the chronic one. There might be direct effects, where anxiety and depression have adverse physiological manifestations, but also some indirect effects, particularly behavior problems which may disturb relationships with the environment of patients.

The aim of this article is to present our finding concerned to depression and anxiety in patients on maintenance hemodialysis.

Materials and methods

In this research the original BDI was used for screening depressive symptoms in dialyzed patients. The Beck Depression Inventory follows the criteria for depression listed in the DSM-IV. The test consists of twenty-one questions that assess the not only presence of depression, but also the severity of depression as well. The BDI is widely used as an assessment tool by health care professionals and researchers in a variety of settings. Each question has a set of at least four possible responses, ranging in intensity. When the test is scored, a value of 0 to 3 is assigned for each answer and then the total score is compared to a key to determine the depression's severity. The standard cut-off scores are as follows: 0-9: indicates no/minimal depression; 10-18: indicates mild

depression; 19-29: indicates moderate depression; 30-63: indicates severe depression [4]. Some researchers suggested the higher cutoff score of BDI (over 14) when chronic patients are tested with. A BDI cutoff of 14 had a sensitivity of 62% and a specificity of 81% for identifying depressive disorder [10]. This was attributed to the overlap between somatic symptoms of depression and symptoms related to the end-stage renal illness, like anemia, fatigue, difficulty concentrating, difficulty sleeping, and poor appetite.

The level of anxiety in this sample is calculated indirectly, using scores obtained in MMPI-201. [in 37]. The anxiety index is calculated using the formula:

$$AI = 1.33D + 1.00 Pt - 0.66Hs - 0.66Hy].$$

As evaluated sample, patients treated with chronic maintenance dialysis comprised 230 participants; 110 females (mean age 55.5 ± 13.5 years), and 120 males (mean age 54.5 ± 14.3 years). The mean duration of maintenance dialysis was 8.3 ± 5.8 years (from 0.5 to 24 years). Patients were selected randomly from three dialysis centers in R. Macedonia.

Results

Results obtained with the Beck Depression Inventory are presented in Table 1.

The incidence of depression in the general population in the Republic of Macedonia is 5.2%. The calculated difference between the percentage of depression in dialyzed patients (total 67.84%) versus depression in the general population (5.2%), shows high statistical significance ($p < 0.01$). It is obvious that depression is much more expressed in hemodialysis patients than in the general population.

Table 1. Depression in dialyzed patients

Level	Percent
severe	14.28%
moderate	17.85%
mild	35.71%
minimal	21.43%

If we use higher cutoff, minimal depression will be transformed in a group without any depression (21.43%) because obtained scores were below 10. Still, 67, 84% of all dialyzed patients confirmed some level of depression. It was interesting to see the influence of age and education on depression level. With this purpose we calculated the Pearson's correlation between the age of patients and depression scores (Figure 1). The data we obtained confirm that age significantly influences the development of depression (correlation $r=0.33$; $p=0.02$). It is well known that bad mood, sadness, helplessness, and fatigue, which are the most significant signs of depression, are much more expressed by older persons.

The education of patients was as follows: university level-11,3%; high school-60,4%; elementary school-28,3%. Concerning educational level and depression, the obtained calculation shows a small negative correlation which is not statistically significant ($r=-0.029$; $p=0.072$) (Figure 2). However, we suppose that higher education could help to find easier the successful coping mechanisms. In general, this study confirmed that patients on dialysis manifest different levels of depression, implicating the need for some response measures.

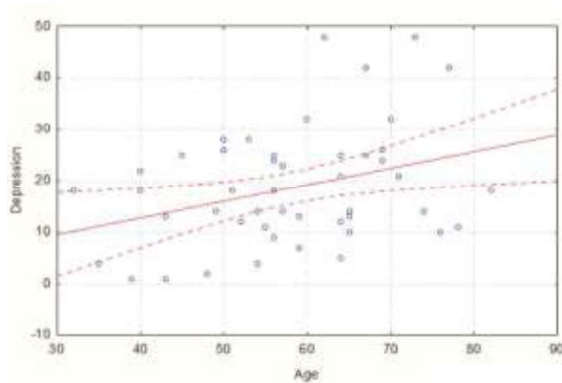


Fig. 1. Correlation between age and depression

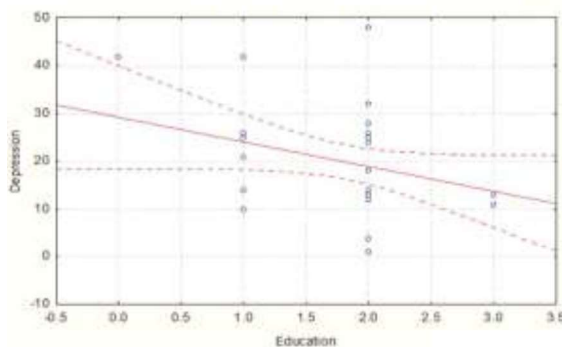


Fig. 2. Correlation between depression and educational level

The selected sample of dialyzed patients was evaluated with MMPI-201 for analyze the personality profile in patients. As an instrument, MMPI-201 allow not only the analysis of personality profiles but also it give the possibility to calculate some additional indexes for the assessment of control mechanisms, aggressiveness, anxiety, or psychosomatics. The anxiety index is calculated using the formula: $AI=1.33D+1.00Pt-0.66Hs-0.66Hy$. We obtained relatively high anxiety index: $AI=27.55$. In our sample of dialyzed patients, the obtained internalization ratio ($IR=1.47$) shows that patients on maintenance dialysis have relatively good emotional control. Similarly, the expressive-repressive index is quite satisfactory ($ER=13.93$). It means that the patients can establish a balance between different emotional states. The index of frustration tolerance is relatively high ($FT=0.58$) which means that patients can cope with many frustra-

tions related to the dialysis treatment as well as with everyday life.

Two other indexes calculated from MMPI scores are: active hostility ($AHI=6.08$); and passive aggression ($PAI=80.1$). The results obtained could be related to suppressed hostility, but also to the high passive aggression in these patients. High anxiety is suppressed and cognitively elaborated, reducing active hostility, but it provokes a passive aggression as a general emotional characteristic. The life experience obtained through the aging process as well as long-term experience as chronic patients could be the reason for these personality characteristics. Obtained results confirmed that dialyzed patients are depressed and anxious, and these two comorbid disorders could influence the long-term prognosis and quality of life.

Discussion

It was pointed in many studies that depression is highly prevalent and associated with poor quality of life and increased mortality in patients with chronic kidney disease, especially those on hemodialysis or those expecting transplantation. Depression and anxiety were attributed to psychosocial and biological changes that accompany dialysis. Additionally, depression has been associated with poor quality of life and adverse medical outcomes in patients with chronic kidney diseases [2,5,6,19-23,42]. Generally, two potential strategies for screening depression in patients with end-stage renal disease are used: the first is conservative and comprises to screen only patients with clinical signs of depression; the second is to screen all new patients periodically, every 6 months to one year with questionnaires. The second strategy seems us to be better.

Murtagh *et al.* in 2008 [32] estimated the prevalence of anxiety in hemodialyzed patients to be 12-52% which depends on different screening methods for anxiety. Cucor *et al.* [6-8] found that 45.7% of selected patients on hemodialysis met criteria for anxiety disorder.

Prevalence of depression in the study of Paimer *et al.* (2013) [34] was calculated to be 39.3% when evaluated by screening questionnaires, and 22.8% when evaluated by clinical interview.

Fischer *et al.* (2011) [14] in a largest study to date reported prevalence of depression of 27.4% using BDI cutoff of 11. Our study showed higher prevalence of depression in evaluated group.

It is supposed that depression is highly correlated with diabetes mellitus. Having in mind that diabetes is closely related to end-stage renal diseases, it seems us logical that these patients manifest depression as a comorbid disease. Depression and anxiety in end-stage renal diseases have been significantly associated with adverse medical outcome, including emergency visits, hospitalizations, cardiovascular complications, peritonitis, withdrawal from dialysis and suicide. In some studies depression was related to younger age of patients, female gender, and duration

of dialysis, cerebrovascular diseases and diabetes. In our study, age is negatively correlated to the level of depression which means that older patients are more depressed than the younger ones. Lower socioeconomic status have also been associated with higher prevalence of depression.

The cause of depression in end-stage renal diseases, especially dialyzed ones is not clear. Some authors suggest that the mechanisms of depression are similar to those in other chronic diseases. Kutner *et al.* (1985) [28] believed that dialysis patients' depression and anxiety levels are closely tied to their physiological status physiological status.

Kimmel *et al.* (2005) [22] found an increased level of depressive affect correlated with both laboratory and behavioral markers of poor compliance. Decreased behavioral compliance with the dialysis prescription correlated with an increased level of depressive affect in prevalent hemodialysed patients.

Frequent clinical or hospital visits, dietary regime, use of many medications, regular blood pressure control, glucose control and weight may lead to depression. The three time a week hemodialysis procedure is additional challenge. Comorbid conditions such as cognitive decline, stroke, and heart failure are additional risks for depression.

Kurrela *et al.* (2005) [29] pointed that persons with end-stage renal diseases significantly more commit suicide than persons in the general population general population. In a study of Shiraziar S. *et al.* in 2017 [43] it was accentuated that there is significant difference between patients with chronic renal diseases and end-stage kidney diseases related to mental problems.

The antidepressive drugs used in dialyzed patients must be prescribed with special precaution. Opposite, some other non-pharmaceutical approaches are available, but still not used frequently such as: biofeedback, neurofeedback, cranial electrostimulation, different relax training techniques, music therapy, exercise training etc. Cognitive-behavioral therapy is also useful. The choice of therapeutic method depends on the doctors [30,33,35-39, 44]. However, in our centers for dialysis medical staff is not enough educated to screen patients with anxiety and depression, so these two conditions are frequently unrecognized [40].

Conclusions

The study confirmed that anxiety and depression are common comorbid conditions in end-stage renal diseases, especially in patients on maintenance hemodialysis.

We showed that depression is related to age, but not significantly with the educational level or with the duration of dialysis.

It was pointed that these two conditions must be screened regularly in all patients and some response measure must be done.

Education for all staff in centers for dialysis must be organized in order to help the psychological problems related to quality of life and preventing worsening of the outcome.

Conflict of interest statement. None declared.

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