

Depression and Anxiety in Patients on Chronic Hemodialysis in University Clinical Hospital Mostar

Miro Klarić¹, Ivona Letica², Božo Petrov¹, Monika Tomić³, Branka Klarić⁴, Ludvig Letica² and Tanja Frančišković⁵

¹ Psychiatric Clinic, School of Medicine, University of Mostar, Mostar, Bosnia and Herzegovina

² School of Medicine, University of Mostar, Mostar, Bosnia and Herzegovina

³ Clinic of Internal medicine, School of Medicine, University of Mostar, Mostar, Bosnia and Herzegovina

⁴ Department of Lung Diseases, School of Medicine, University of Mostar, Mostar, Bosnia and Herzegovina

⁵ Psychiatric Clinic, School of Medicine, University of Rijeka, Rijeka, Croatia

ABSTRACT

Depression and anxiety are prevailing mental problem in patients on chronic hemodialysis and they have great influence on outcome of illness. Additionally, these disorders are rarely identified in that population of patients and they are insufficiently treated. The aim of this study was to assess the prevalence of depression and anxiety in patients on chronic hemodialysis in University Clinical Hospital Mostar and to examine the correlation between the demographic variables and the time spent on dialysis with depression and anxiety levels. The experimental group consisted of 56 patients on chronic hemodialysis in Mostar Clinical Hospital. The control group 1 consisted of 53 patients diagnosed with a chronic illness and treated for at least a year, while the control group 2 consisted of 51 persons who were not diagnosed with any chronic somatic or mental illness. Demographic data were collected using the constructed questionnaire. The Beck Depression Inventory-BDI was used to determine depression, while the Spielberger State-Trait Anxiety Inventory-STAI was used to determine anxiety. We recorded significantly higher prevalence of depression in patients on chronic dialysis (51.8%) than in patients with a chronic illness (41.5%) and persons without chronic illnesses (9.8%; $p < 0.001$). Trait anxiety level was significantly higher in hemodialysed patients compared to the other two groups ($p = 0.006$) but there were no significant differences in state anxiety level. The study has not shown any significant difference in the prevalence of depression and anxiety level regarding the differences in sex, gender and education level, apart from a higher level of state anxiety in patients with a lower education level ($p = 0.032$). These results indicate that patients on hemodialysis have a significantly higher level of depression and a higher level of trait anxiety compared to patients with chronic illnesses and especially compared to general population.

Key words: hemodialysed patients, depression, anxiety

Introduction

The results of many studies in the field of liaison psychiatry indicate a high prevalence of psychological disorders in patients with somatic illnesses and point to the significance of psychological disorders in determining the final outcome of treatment¹⁻³. Mental problems are more prevalent in special forms of organic disorders, such as end stage renal disease (ESRD)^{3,4}.

A major breakthrough in dialysis enables the patients with end stage renal disease to live in a satisfactory somatic condition for many years. However, psychological problems occurring in this form of treatment, such as mood disturbance or indifference, often pass unnoticed and⁵ and are barely ever treated⁶⁻⁸. Depression is identified as the primary mental problem in patients on chro-

nic haemodialysis^{9–11}. Most studies indicate that 20–30% patients on hemodialysis suffer from depressive disorder^{7,8,11,12} but according to some studies no less than 63% of such patients suffers from depression¹³.

Symptoms of depression in patients on chronic hemodialysis have a special significance and can affect the progress and the outcome of illness in several ways^{14,15}. For instance, appetite loss can instantly lead to metabolic imbalance. A lack of motivation and depressive mood can contribute to ignoring the medical advice (diet for example)^{16–18}, and it can even result in giving up the treatment¹⁹. Some studies reveal that even the most relevant indicators of somatic conditions in patients on hemodialysis (high blood levels of potassium, blood pressure, blood levels of urea and creatinine, weight gain between two dialyses, etc.) significantly depend on depression and anxiety levels²⁰.

There are many causes of psychological distress in patients on chronic hemodialysis. A feeling of excessive dependence on medical staff, family and medical apparatus is one of many undesirable elements of experience that can lead to serious changes in the patients' self-esteem. This increases with the duration of the treatment²¹. The feeling can also lead to increased anxiety and increased irritability in relationship with the environment^{18,19}. Aggravating circumstances such as post-war and transitional social and economic deprivation like those in Mostar area in Bosnia and Herzegovina can bring on additional stressors, especially in patients who suffer from chronic illnesses^{22–24}.

Given all the circumstances, it can be assumed that a large part of patients on hemodialysis in University Clinical Hospital Mostar has higher levels of depression and anxiety. Owing to social factors, the levels of depression and anxiety in these patients could be higher than described in literature on the subject. Consequently, the duration of treatment and the patients' age and education level are expected to affect such an emotional reaction.

The purpose of this study is to compare the levels of depression and anxiety in patients on chronic hemodialysis in University Clinical Hospital Mostar and examine the correlation of demographic variables and the time spent on dialysis with the levels of depression and anxiety.

Participants and Methods

This cross-sectional study was conducted from March to June 2005 in the Hemodialysis Unit of University Clinical Hospital Mostar and family medicine units in Mostar Medical Centre. The patients on hemodialysis were queried during the treatment procedure and the family medicine patients were queried during regular medical examinations. The research was approved by the Ethical Committee of University Clinical Hospital Mostar.

Participants

The experimental group: The research encompassed all the patients on chronic hemodialysis (n=114). In the time of research 29 patients were absent due to treatments in other clinics. All the patients were previously informed on the purpose of the research and asked if they were willing to participate. Thirteen patients out of 85 refused to participate in the research, and 14 patients were excluded due to a serious health condition. The other 56 patients (65.8%), who gave their written informed consent, made the experimental group and responded to questionnaires by themselves or helped by the researchers. None of the patients stated they were undergoing psychiatric treatment or being administered psycho-active medication treatment by a doctor.

The control group 1 consisted of patients who were not treated on hemodialysis and who were not undergoing any similar and serious treatment. The inclusion criterion was at least a year old diagnosis and treatment of a chronic illness. The exclusion criteria were serious, incurable illnesses, serious health condition and previously diagnosed mental disorders. The patients were recruited in the family medicine units of Mostar Medical Centre. All the patients were informed on the purpose of the research upon their arrival to medical examination. The patients who met the inclusion criteria and gave their written consent received the questionnaires, and they filled them out on the spot or at home, in which case they would come back with completed questionnaires. Out of 97 contacted patients, 53 (54.6%) gave their written consent. The most frequent diagnoses of the patients from the control group 1 were: diabetes mellitus (n=19), arterial hypertension (n=17), chronic painful syndromes (n=8), chronic gastritis (n=6), ulcer disease (n=3). Seventeen patients suffered from more than one illness.

The control group 2 consisted of 51 persons who were not diagnosed with any chronic somatic or mental illness. The group was formed based on the criteria applied for the control group 1. Both control groups matched the experimental group in size and significant parameters (sex, age and socioeconomic status).

Instruments

The General Demographics Questionnaire designed for the purpose of the research was used for gathering general demographic and clinical data. The Beck Depression Inventory – BDI was used to determine the severity of depression²⁵. The questionnaire is made of 21 items which reflect the presence and severity of depression symptoms. Each item consists of four statements ranging from 0 to 3 in terms of symptoms intensity. Total result stands for the sum of all BDI item scores (0 to 63 points), with 10 points or higher indicating depression. The questionnaire is a reliable and validated instrument for measuring depression symptoms in clinical and non-clinical samples²⁶, and it is widely applied in examining the ESRD population^{7,27–29}. The Spielberger State-Trait Anxiety Inventory – STAI was used to measure anxiety³⁰. The questionnaire consists of two sets of twenty state-

ments that measure state anxiety« and »trait anxiety«. State anxiety refers to anxiety that respondents feel »right now, at this moment«, as a reaction to a specific, current situation. Trait anxiety refers to relatively stable individual differences in anxiety proneness. It measures long-standing anxiety relating to specific situations. Trait anxiety reflects the tendency of an individual to perceive stressful situations as dangerous and threatening and to react to such situations in a way which has the characteristics of state anxiety. Trait anxiety predisposes an individual to react and behave in a predictable manner to a perceived threat. Persons with higher level of trait anxiety experience anxiety in a larger number of situations³⁰.

Participants responded to statements on a four-point Likert scale. Ten statements measure state anxiety and thirteen statements measure trait anxiety, with 4 points reflecting the presence of high anxiety level and 1 point indicating the minimum anxiety level. The rest of the statements are to be recorded the other way round: 4 points indicate the minimum anxiety and 1 point indicates the maximum anxiety. Minimum score in each of the two sets of statements is 20, and the maximum is 80. The questionnaire is a reliable and validated instrument and it is widely used in clinical and non-clinical population^{31–33}.

Statistical analysis

As continuous variables have symmetric distribution, we used the arithmetic mean and standard deviation to describe their mean value and dispersion measure and we calculated descriptive parameters. Student's t-test was used to compare the two variables, while the differences between the three groups of respondents were calculated by using one-way analysis of variance. The correlation between the variables was determined using the Pearson Correlation Coefficient. The differences between the nominal variables were examined using the χ^2 -test. The significance level was set at $p < 0.05$. Statistical anal-

ysis was carried out using the SPSS for Windows (version 13.0, SPSS Inc, Chicago, Illinois, SAD) and Microsoft Excel (version 11 Microsoft Corporation, Redmond, WA, SAD).

Results

The patients on hemodialysis were aged from 28 to 77, with the mean age of 56.2 ± 13.4 years. There were not any statistically significant differences between the respondents in the experimental group and the control groups regarding age, sex and education level.

The prevalence of depression in patients on chronic hemodialysis (51.8%) was significantly higher than in patients with chronic, but not kidney diseases (41.5%) and persons without chronic diseases (9.8%) ($\chi^2 = 22.15$; $p < 0.001$; Table 1). The research has not revealed any statistically significant difference in state anxiety in the three observed groups ($F = 2.03$; $p = 0.135$), while trait anxiety was significantly higher in patients on chronic hemodialysis than in the patients from the other two groups ($F = 5.36$, $p = 0.006$) (Table 1). Differences in depression prevalence among the patients on chronic hemodialysis regarding demographic characteristics (sex, age, education level) and the time spent on hemodialysis were tested by using the χ^2 -test. Prevalence of depression was not significantly different regarding sex, age, education level and the time spent on hemodialysis (Table 2).

The analysis of variance was used to test a possible difference in the level of state anxiety and the level of trait anxiety relating to demographic characteristics (sex, age, education level) and the time spent on hemodialysis. Anxiety level significantly differed depending on the education level. Patients with a lower education level showed a significantly higher level of state-anxiety ($F = 3.17$; $p = 0.032$), while there was not any difference in trait anxiety ($p > 0.05$). The patients' sex and age and the time spent on hemodialysis did not affect state anxiety nor did they affect trait anxiety ($p > 0.05$) (Table 3).

TABLE 1
DIFFERENCES IN DEPRESSION PREVALENCE AND ANXIETY LEVEL (STATE-ANXIETY AND TRAIT-ANXIETY) IN PATIENTS ON CHRONIC HEMODIALYSIS COMPARED TO PATIENTS WITH CHRONIC ILLNESSES AND PERSONS WITHOUT CHRONIC ILLNESSES

Depression	The number (%) of respondents			χ^2 *	P
	Patients on chronic haemodialysis	Persons with chronic illnesses	Persons without chronic illnesses		
Does not exist	27 (48.2)	31 (58.5)	46 (90.2)		
Exists	29 (51.8)	22 (41.5)	5 (9.8)	22.154	<0.001
Total	56 (100.0)	53 (100.0)	51 (100.0)*		
Anxiety			MD±SD	F**	
STAI-S‡	35.2±11.1	37.9±11.9	33.8±8.3	2.028	0.135
STAI-T†	40.7±12.8	39.4±11.1	34.1±8.1	5.359	0.006
Total	56 (100.0)	53 (100.0)	51 (100.0)*		

* Pearson χ^2 -test, **ANOVA test

‡ STAI-S – state-anxiety

† STAI-T – trait-anxiety

TABLE 2
DIFFERENCES IN DEPRESSION PREVALENCE IN PATIENTS ON CHRONIC HEMODIALYSIS REGARDING
DEMOGRAPHIC CHARACTERISTICS AND TIME SPENT ON HEMODIALYSIS

Variables	The number (%) of respondents		Total	χ^2	p
	No depression	With depression			
Sex					
Female	10 (47.6)	11 (52.4)	21 (100.0)	0.005	0.945
Male	17 (48.6)	18 (51.4)	35 (100.0)		
Age					
<45	8 (57.1)	6 (42.9)	14 (100.0)	5.458	0.141
45–59	7 (36.8)	12 (63.2)	19 (100.0)		
60–70	5 (35.7)	9 (64.3)	14 (100.0)		
>70	7 (77.8)	2 (22.2)	9 (100.0)		
Education					
No education	4 (50.0)	4 (50.0)	8 (100.0)	0.188	0.980
Elementary	8 (47.1)	9 (52.9)	17 (100.0)		
Secondary	13 (50.0)	13 (50.0)	26 (100.0)		
Higher	2 (40.0)	3 (60.0)	5 (100.0)		
Years on HD					
<2	8 (47.1)	9 (52.9)	17 (100.0)	4.070	0.254
2–5	6 (33.3)	12 (66.7)	18 (100.0)		
6–10	7 (53.8)	6 (46.2)	13 (100.0)		
>10	6 (75.0)	2 (25.0)	8 (100.0)		

Discussion

The results indicate that patients on chronic hemodialysis have a high prevalence of comorbid depression (51.8%) and that depression in these patients is significantly more frequent compared to the family medicine patients who suffer from chronic illnesses (41.5%), and especially compared to general population (9.8%). Patients on hemodialysis groups have a significantly higher level of trait anxiety than the patients in the control groups ($F=5.359$; $p=0.006$), while there was not any difference in state anxiety ($F=2.028$; $p=0.135$). The results point to the severity of clinical condition of the patients on hemodialysis and agree with previous researches which determined that depression and anxiety are the basic mental problems in these patients^{5–11}. Given the fact that results of researches reveal a wide range of depression prevalence in patients on hemodialysis (from 20 to 63%)^{7,8,11–13,34}, our results are coming closer to the upper-bound values and can be compared to results from similar studies¹³. Compared to literature data^{1,2,22}, the results of depression prevalence in both control groups (patients with chronic illnesses and persons from general population) also correspond to the upper-bound values. Therefore, it can be assumed that war trauma and post-war social and economic deprivation affected the results of our research. Results of the researches on posttraumatic psychological effects on general population speak in favor of this assumption^{23,24}.

According to the literature data, the root causes of high prevalence of comorbid depression and anxiety in patients on hemodialysis lie in drastically changed living conditions of these patients^{4,6,34}. Our results, which revealed a significantly higher prevalence of depression and a higher level of anxiety in patients on hemodialysis compared to patients with other chronic illnesses, support this theory.

A number of causes can contribute to such an outcome. Apart of previously mentioned dependence on medical staff and family and affected self-esteem²¹, there are serious limitations arising from the treatment procedures. Subjective perception of the situation can have a negative effect on the social role fulfillment. Patients on hemodialysis most often lose their social and professional position; they are often financially deprived and have to change their lifestyles and habits⁴. This requires great psychological adjustments which are often followed by anxiety and concerns about the future, including a constant uncertainty regarding complications and the treatment outcome. Our results indicating high levels of trait anxiety in patients on hemodialysis should be viewed in this context. Trait anxiety in these patients is a matter of adjustment and sends a signal that there is a change in usual balance/homeostasis in a human body or in his/her environment³⁵.

Furthermore, it has been determined that sex, age, education level and the time spent on hemodialysis are

TABLE 3
DIFFERENCES IN ANXIETY LEVEL (STATE AND TRAIT ANXIETY) IN PATIENTS ON CHRONIC HEMODIALYSIS RELATING TO DEMOGRAPHIC CHARACTERISTICS AND TIME SPENT ON HEMODIALYSIS

Variables	MD±SD*	
	STAI-S	STAI-T
Sex		
Female	35.2±11.1	44.4±14.2
Male	33.9±9.9	38.5±11.5
Age		
<45 years	34.8±10.8	37.3±12.3
45–59 years	34.1±10.0	40.5±9.7
60–70 years	35.4±11.3	42.1±14.5
>70 years	33.7±9.9	44.3±16.7
Education		
No education	42.8±17.5***	49.8±7.1
Elementary	37.1±11.1	40.7±11.8
Secondary	32.6±7.9	39.2±12.0
Higher	27.4±4.3	33.8±4.8
Time spent on hemodialysis		
<2 years	34.9±13.4	39.1±12.3
2–5 years	37.5±10.8	42.3±13.5
6–10 years	34.4±9.2	41.0±13.8
>10 years	31.7±10.2	40.1±12.3

*Note: MD – mean difference; SD – standard deviation; STAI-S – state anxiety; STAI-T – trait anxiety

**Statistically significant difference in state anxiety level regarding the education level ($F=3.167$; $P=0.032$).

not correlated with depression prevalence and anxiety level, except of the education level being correlated only with state anxiety level. Even though certain researches revealed patients' age and the duration of dialysis as significant factors of depression and anxiety²⁹, our results did not confirm these conclusions, possibly because our research included a small number of respondents, but it could also be due to the fact that our patients were highly exposed to post-war stressors of everyday life. War stressors lead to deterioration of an already impaired sense

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of being in control over one's own life³⁶, which is the reason why common protection factors may lose their significance. However, it turned out that the patients with lower education level, especially those with no education, had a higher level of state-anxiety. This could be due to inadequate coping patterns of patients with lower education level³⁷, and agrees with the results from other studies³⁸. In spite of significant psychological difficulties identified in the patients on chronic dialysis, none of the patients reported being in psychiatric treatment or being diagnosed with such problems, which points to the fact that depression and anxiety in these patients are not recognized and that their effect on the illness and treatment progress is systematically ignored. The result is in agreement with results of other studies, which also revealed that depression and anxiety in hemodialysed patients is often unrecognized, and seldom treated^{6–8,34}.

It has to be emphasized that this research has certain methodological limitations, which include a small number of respondents and relying only on the measures of the patients' self-evaluation of their mental condition. In addition, an assessment of war psycho-trauma and its effects on the patients' depression and anxiety levels was not carried out, although the recent war exerted strong effects on general population of the local community^{23,24}. In spite of these limitations, this research has methodological advantages which reflect in the fact that all the patients on chronic hemodialysis in University Clinical Hospital Mostar were included in the research, and that two control groups in our research had the same basic demographic characteristics.

Even though the results of this study cannot be widely generalized, they can be compared with most of the studies that observed psychological effects in patients on chronic dialysis^{11,13}.

Conclusion

The results of this research indicate a high prevalence of depression and anxiety in patients on chronic hemodialysis. Notwithstanding a high rate of prevalence of psychological problems in patients on chronic hemodialysis, routine clinical practice does not include taking notice of these problems and treating them.

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M. Klarić

*Psychiatric Clinic, School of Medicine, University of Mostar, Bijeli Brijeg bb, 88000 Mostar, Bosnia and Herzegovina
e-mail: klarićmiro@gmail.com*

DEPRESIVNOST I TJESKOBA U BOLESNIKA NA KRONIČNOM PROGRAMU HEMODIJALIZE U KB MOSTAR: PRESJEČNA STUDIJA

SAŽETAK

Depresija i tjeskoba prevladavajući su mentalni problem u bolesnika na kroničnom programu hemodijalize i imaju veliki utjecaj na ishod bolesti. I pored toga kod ove populacije bolesnika ovi poremećaji su rijetko identificirani i nedovoljno se liječe. Cilj ovog istraživanja bio je procijeniti učestalost depresije i anksioznosti u bolesnika na kroničnom programu hemodijalize u SKB Mostar, te ispitati povezanost demografskih varijabli i vremena provedenog na dijalizi sa razinom depresivnosti i anksioznosti. Ispitnu skupinu činilo je 56 bolesnika koji su na kroničnom programu hemodijalize. Kontrolnu skupinu 1 činilo je 53 bolesnika s dijagnosticiranim i najmanje godinu dana liječenim od nekog kroničnog oboljenja, a koji nisu na hemodijalizi, dok su kontrolnu skupinu 2 činile osobe koje nisu imale dijagnosticirano kronično ili psihičko oboljenje, njih 51. Demografski podatci ispitanika prikupljeni su pomoću upitnika koji je konstruiran za potrebe ovog istraživanja. Za utvrđivanje depresije korišten je Beckov upitnik depresivnosti (Beck Depression Inventory-BDI), a za mjerenje anksioznosti Spielbergov upitnik anksioznosti-STAI (State-Trait Anxiety Inventory-STAI). Utvrđena je značajno veća učestalost depresije u bolesnika na kroničnom programu hemodijalize (51,8%) u odnosu na bolesnike s kroničnim oboljenjima (41,5%) i osobe bez kroničnih oboljenja (9,8%) ($\chi^2=22,15$; $p<0,001$). Između promatranih skupina nije se pokazala značajna razlika u anksioznosti kao trenutnom stanju ($F=2,03$; $p=0,135$), dok je razina anksioznosti kao osobina ličnosti bila značajno veća u hemodijaliznih bolesnika u odnosu na druge dvije skupine ($F=5,36$; $p=0,006$). U odnosu na spol, dob, obrazovanje i vrijeme provedeno na hemodijalizi, nije bilo značajne razlike u učestalosti depresije i razine anksioznosti, osim značajno veće anksioznosti kao prolaznog stanja u bolesnika s nižim obrazovanjem ($F=3,17$; $p=0,032$). Ovaj nalaz ukazuje da bolesnici na kroničnom programu hemodijalize u odnosu na bolesnike s kroničnim oboljenjima, a posebno u odnosu na opću populaciju, imaju značajno veću učestalost depresije i višu razinu anksioznosti kao osobinu ličnosti.