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Social adaptability and substance abuse: Predictors of depression among hemodialysis patients?

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Abstract

Background: Several aspects linked to social are involved in the onset of depressive feelings. We aimed to find out if social adaptability and substance abuse predict depression among end-stage renal disease (ESRD) patients undergoing hemodialysis (HD).

Methods: We included 145 ESRD patients undergoing HD. Social adaptability was estimated by the Social Adaptability Index (SAI). Substance abuse was defined according to SAI. We screened for depression by applying the 20-item version of the Center for Epidemiologic Studies Depression Scale. A score $\geq$ 24 classified the patients as depressed. Comparisons between depressed and non-depressed patients were carried out and logistic regression was performed to test gender, age, total SAI, SAI without the substance abuse item, only the substance abuse score and substance abuse as a categorical variable (yes/no) as predictors of depression.

Results: There were 36 (24.8%) depressed patients. There were no differences regarding demographic and laboratory data between the depressed and non-depressed patients. Mean SAI among depressed and non-depressed patients was, respectively, 6.1 $\pm$ 1.6 vs. 6.2 $\pm$ 1.9 (p=0.901). The percentage of patients with or without substance abuse among depressed patients was, respectively, 13.8% vs. 13.9% (p=1.000). Gender, age, total SAI, SAI without the substance abuse item, only the substance abuse score and substance abuse as a categorical variable did not predict depression.

Conclusions: Social adaptability and substance abuse did not predict depression in HD patients. We propose that aspects related to socioeconomic status not comprised in SAI items should be ruled out as predictors of depression.

Keywords: Depression, Dialysis, End-stage renal disease, Social adjustment, Substance abuse detection

Background

End-stage renal disease (ESRD) patients undergoing hemodialysis (HD) cope with several problems and difficulties related to the disease and its treatment. As a consequence, depressive feelings are common among them [1,2]. We care for HD patients from a low-income region in Brazil. Our patients need all kinds of help to cope with the treatment, like housing for patients living far from the renal unit, provision of food and government financial assistance. So, we are very interested in all aspects of socioeconomic status and their relationship with patient

outcomes. Previously, using a validated Brazilian instrument, we were not able to detect differences in prevalence of depression according to economic class [3].

In light of our daily practice of caring for socially disadvantaged patients, the data on the influence of socio-economic status on depression led to our interest in finding socioeconomic predictors of depression among HD patients [4,5]. Searching for an appropriate instrument, we found the Social Adaptability Index (SAI) [6]. This instrument is a composite index comprising five kinds of social aspects: education level, marital status, employment status, income and substance abuse. As a sum of these five social items, SAI was able to predict death among HD patients and graft loss among kidney recipients [7-9].

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Therefore, we aimed to compare the SAI between depressed and non-depressed HD patients and to test the SAI and its substance abuse item separately as predictors of depression.

Methods

Sample

The sample was composed of ESRD patients undergoing HD during June 2011 in the only renal unit in the north of Ceará state, northeastern Brazil. The renal unit works in the reference hospital of the region. The criteria for exclusion were age below 18 years and less than three months on dialysis. One hundred forty-five patients were included of a total of 160. Among the patients excluded there were 7 with less than three months on therapy, 5 who refused to participate and 3 under 18 years. All patients were undergoing conventional HD (three sessions of four hours per week) with polysulfone dialyzers (maximum number of reuses=12). The study protocol and informed consent were approved by the ethics committee of Vale do Acaraú University, with which the hospital is associated. All patients gave written consent to participate in the study. Even though not a criterion for exclusion, we determined after the informed consent that none of the patients in the sample had received treatment for depression previously.

Social adaptability index (SAI)

The index was calculated by the sum of five components: employment status, education level, marital status, substance abuse and income, as described by Goldfarb-Rumyantzev et al. [6]. All components were scored on a scale of 0 to 3, except for income, which was scored 0 to 2. In addition to total SAI, we tested the SAI without the substance abuse item, only the substance abuse score and substance abuse as a categorical variable (yes/no) separately as an independent predictor. The consistency of SAI tested by Cronbach's alpha was 0.851 for the total scale and within 0.835 and 0.858 for subscales.

Depression evaluation

We used the 20-item version of Center for Epidemiologic Studies Depression Scale (CES-D) [10]. We have been applying CES-D among HD samples for years and its consistency, tested by Cronbach's alpha, is within 0.850-0.900. Respondents rate items by recalling the past week and using a three-point response scale, with higher scores indicating the presence and persistence of symptoms. A score ranging from 0 to 60 is calculated by summing the score of each item. We classified depression as a score ≥ 24, as validated by Silveira and Jorge [11].

Patient data

The demographic data, time on dialysis and underlying etiology of ESRD were assessed in unit records. The underlying kidney disease was classified by clinical criteria and not by histopathology. The laboratory results were those routinely measured in HD patients: creatinine, albumin, hemoglobin, calcium and phosphorus and Kt/V. Kt/V was estimated using a second-generation Daugirdas formula [12].

Statistical analyses

Comparisons between depressed and non-depressed patients were carried out by the Chi-square test for categorical variables, and by the Student-t and Mann–Whitney tests, when indicated, for continuous variables. Logistic regression was performed to test gender (male as reference category), age, time on dialysis, total SAI, SAI without the substance abuse item, only the substance abuse score and substance abuse (no substance abuse as reference category) as predictors of depression. Statistical significance was considered to be a P value of <0.05. All the statistical analyses were performed using the SPSS version 13.0 program package [13].

Results

The sample characteristics are shown in Table 1. The results concerning each component of SAI are shown in Table 2. Among 145 patients, there were 36 (24.8%) with depression. The comparisons between depressed and non-depressed patients are shown in Table 3. The mean SAI among depressed and non-depressed patients was, respectively, 6.1 ± 1.6 vs. 6.2 ± 1.9 (p=0.901) (Table 3). The percentage of patients experiencing substance abuse among depressed and non-depressed patients was, respectively, 13.9 vs. 13.8% (p=1.000) (Table 3). Gender, age, time on dialysis, total SAI, SAI without the substance abuse item, only the substance abuse score and substance abuse as a categorical variable were not predictors of depression (Table 4).

Discussion

Our finding of 24.8% depressed patients is in accordance to the overall literature, which reports depression of 20 to 30% among HD patients [1]. We found the same prevalence of depression among men and women, in line with another study and also with our previous research [3,14]. We think the lack of gender difference is due to the powerful stressors associated with HD, which neutralize the gender differences occurring in the general population [15]. Social factors, like male perception of loss of the status of main household breadwinner due to illness, and biological factors, like low level of testosterone, a protective hormone against depression, can also be explanations [16,17].

We aware of divergences about the optimal cut-off of CES-D to classify depression. We chose a cut-off of ≥ 24, which is within the range for the screening of mild

Table 1 Sample characteristics

Variables	
Gender	
Male	88 (60.7)
Female	57 (39.3)
Age	48.1 ± 15.6
Etiology of kidney disease	
Glomerulonephritis	47 (43.1)
Hypertensive nephrosclerosis	32 (29.4)
Diabetic	12 (11.0)
Obstructive	6 (5.5)
Polycistc	5 (4.6)
Lups	1 (0.9)
Undetermined	6 (5.5)
Time on dialysis (months)	53.4 ± 51.4
Social Adaptation Index	6.21 ± 1.8
Social Adaptation Index	5.97 ± 2.1
without the substance abuse item	
Substance abuse	
Yes	20 (13.8)
No	125 (86.2)
Depression	
Yes	36 (24.8)
No	109 (75.2)
Laboratory	
Hemoglobin	10.0 ± 1.7
Creatinine	8.7 ± 2.4
Albumin	4.3 ± 0.4
Kt/V	1.8 ± 0.4

Table 2 Distribution of sample according to each variable of the Social Adaptability Index

Variable	N	%
Employment status		
Unemployed	42	29.0
Retired	97	66.9
Working part time	4	2.7
Working full time	2	1.4
Education level		
Did not complete high school	104	71.7
High school graduate	26	18.0
College graduate	12	8.3
Postgraduate study	3	2
Marital status		
Not married	39	27.0
Divorced	11	7.8
Married without children	6	4.1
Married with children	89	61.1
Substance abuse		
Abusing drugs, alcohol and tobacco	5	3.5
Abusing substances in 2 of 3 categories	4	2.7
Abusing substances in 1 of 3 categories	11	7.6
None	125	86.2
Income		
≤$20K/year per household	112	77.2
$20-50K/year per household	25	17.2
≥50K/year per household	8	5.6

depression, described in the literature as being between 16 and 26 [18].

We were surprised that even though the patients come from a low-income area, the mean SAI of our sample is close to that found among American patients [6,7]. This can be due to the fact that socioeconomic disadvantages are risk factors for ESRD worldwide [19].

We were disappointed that SAI was not different between depressed and non-depressed patients, and did not predict depression. Our initial hypothesis of SAI being a predictor of depression was based on data about the relationship of socioeconomic aspects with depression [4,5]. On the other hand, we have to recognize that the links of low SAI score and bad clinical objective outcomes, like death and graft loss, are more easily explained by health care barriers, lower literacy level (negatively influencing treatment adherence), and less social support to help solve problems [9]. Our hypothesis was that all these factors could also be associated

with depressive feelings. But when dealing with subjective outcomes such as depression, rather than with objective outcomes like mortality and morbidity, plausibility usually does not ensure existence. The main reason for unexpected results concerning subjective outcomes is the modulation of socioeconomic aspects by personality and ways of coping. Among the mechanisms proposed to explain how socioeconomic status influences clinical outcomes, social support is the best studied concerning depression. There is doubtless an overlap between social adaptability and social support, especially regarding aspects like presence of cohabitants, employment status and education level. On the other hand, some emotional aspects of social support, for instance reliance on friends and family or opportunities for emotional expression, can be independent of social aspects comprised by the SAI. Even when social support is evaluated by a specific tool, like the 24-item Social Provisions Scale, depression among ESRD patients depends more on patients' personality than on the perceived social support [20]. In this last referenced study, better social support among patients high in the personality trait of "agreeableness" was

Table 3 Comparisons between depressed and non-depressed patients

Variables	Depressed	Non-depressed	P
Gender			
Male	17 (47.2)	71 (65.1)	0.076
Female	19 (52.8)	38 (34.9)	
Age	47.0 ±14.6	48.5 ± 16.0	0.627
Diabetes			
Yes	7 (19.4)	12 (11.0)	0.253
No	29 (80.6)	97 (89.0)	
Time on dialysis (months)	54.3 ± 48.3	55.1 ± 50.5	0.384
Social Adaptation Index	6.1 ± 1.6	6.2 ± 1.9	0.901
Social Adaptation Index without the substance abuse item	5.8 ± 1.9	6.0 ± 2.2	0.793
Substance abuse			
Yes	5 (13.9)	15 (13.8)	1.000
No	31 (86.1)	94 (86.2)	
Depression score	30.9 ± 6.4	11.2 ± 6.5	<0.001
Laboratory			
Hemoglobin	9.6 ± 1.6	10.1 ± 1.7	0.162
Creatinine	8.2 ± 2.3	8.9 ± 2.4	0.123
Albumin	4.3 ± 0.4	4.4 ± 0.4	0.528
KtV	1.8 ± 0.5	1.8 ± 0.4	0.437

associated with a decrease in depressive symptoms, whereas social support had little effect on depression change for individuals ranked as low in "agreeableness".

In clinical practice, there are no widely used and well-validated instruments to assess socioeconomic status able to work as predictor tools in ESRD. So, an instrument like the SAI, validated as a predictor of objective clinical outcomes among HD and transplanted patients, seemed to us a very practical way of using a short instrument also to predict subjective outcomes, such as depression, surely a main outcome among HD patients. Medical monitoring of patients on HD is a hard task and renal units need to work with practical and, if possible, few instruments. Unfortunately, based on our preliminary data, SAI does not predict depression. Granted, our sample is small and from an underdeveloped area, which means there are more young patients and fewer diabetics, with glomerulonephritis being the main cause of ESRD. So, our results may not hold for other more typical samples. In our country, SAI was never tested as a predictor tool for any outcome. We believe our results can stimulate further research using SAI in larger samples with different profiles from ours.

The use of the SAI offered us an opportunity to evaluate an important question in HD patients: substance abuse. In the nephrology area, substance abuse must be highlighted as a risk for ESRD [21,22]. Substance abuse as a prior condition to the beginning of dialysis can be one explanation for the relatively high prevalence of substance abuse among patients undergoing HD. We found 13.8% of the patients admitted to being or having been substance abusers, a

Table 4 Logistic regression to detect predictors for depression

Variable	Odds Ratio	Confidence Interval	P
Gender[1]	2.135	0.944-4.831	0.069
Age	1.003	0.975-1.031	0.856
Time on dialysis	1.001	0.994-1.008	0.865
Social Adaptability Index	0.971	0.765-1.231	0.805
Social Adaptability Index without the substance abuse item	0.977	0.822-1.165	0.791
Only the substance abuse score	0.963	0.540-1.724	0.898
Substance abuse[2]	1.091	0.316-3.764	0.891

[1]Male as reference category.
[2]No substance abuse as reference category.

number very close to the 19% found by others [23]. Moreover, substance abuse also needs to be studied as an emotion-oriented coping method against stressors and difficulties of ESRD and HD. In our context of a renal unit located in a very poor region, we cannot forget that in the neighborhoods where most of our patients live the use of recreational drugs is very common, as is their sale.

There were limitations of this study, mainly due to the cross-sectional design. Trends of causality related to depression, social adaptability and substance abuse cannot be clarified. Also, no data about duration of substance abuse (previous or after the beginning the dialysis) were collected. A sample from a single renal unit is always a barrier for generalizations, and as previously commented, our sample is quite different from those from developed areas. However, despite these limitations, we emphasize that it is the first time the SAI has been studied in Brazil, which contributes both to stimulate new research in our country using the same instrument and opens the possibility for comparing results across different countries.

Conclusions

Social adaptability and substance abuse prevalence did not differ among depressed and non-depressed HD patients, and therefore these variables cannot be used as predictors of depression. We propose that aspects related to socioeconomic status not comprised in SAI items should be ruled out as predictors of depression.

Abbreviations

CES-D: Center for Epidemiologic Studies Depression Scale; ESRD: End-stage renal disease patients undergoing; HD: Hemodialysis; SAI: Social Adaptability Index.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

PRS was responsible for the conception, design, analysis and interpretation of data. FPNA edited and made critical revision of the manuscript. Both authors read and approved the final manuscript.

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