

Analysis of Depression in Continuous Ambulatory Peritoneal Dialysis Patients

It is well known that depression and sense of hopelessness worsen the quality of life in end-stage renal disease (ESRD) patients receiving dialysis. However, the characteristics of depression in continuous ambulatory peritoneal dialysis (CAPD) patients have not been analyzed in detail. We performed this study to investigate the severity of depression and the factors affecting depression in CAPD patients. With 96 CAPD patients, we evaluated each patient's depressive mood and hopelessness with CES-D (Center for Epidemiologic Studies Depression) scale and Beck Hopelessness Scale. We also evaluated the degree of stress of each patient with internal individual stress scale. Most CAPD patients experienced severe depression compared with the general population. Their depression was better explained by psychological factors, such as stress and sense of hopelessness, than by demographic or physical factors. On the basis of these findings, we suggest that the treatment of depression in CAPD patients might be possible by modulation of psychological factors.

Key Words : *Depression; Peritoneal Dialysis, Continuous Ambulatory*

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INTRODUCTION

Depression is regarded as the most common psychological problem which has a strong impact on the quality of life in patients with end-stage renal disease (ESRD) (1-5). The incidence of depression in dialysis patients has been reported to be variable (6). The majority of previous studies involved hemodialysis (HD) patients, and those on continuous ambulatory peritoneal dialysis (CAPD) patients are limited.

Although patients receiving CAPD show better psychosocial adjustment than those receiving HD (7-9), the incurability of ESRD and the fatal outcome of the cessation of CAPD can put the patients under a very stressful condition. Such psychological stress contributes greatly to the induction of various psychological disorders among CAPD patients, especially depression (10, 11).

Many previous studies considered depression as an important factor that determines the patient's survival (12-15), but they did not succeed in measuring or controlling physiological factors that can reflect the severity of disease.

The sense of hopelessness was reported as the aggravating factor of depression (16). Hopelessness is closely associated with certain cognitive aspects of the patient, including negative

expectancies about the future and suicidal ideas (17, 18). Chronically ill patients, such as CAPD patients, experience certain negative events associated with their illness repeatedly. Such experiences increase negative expectancies and feelings of hopelessness. Accordingly, we can better understand the depressive symptoms and eventually intervene with depression therapeutically by assessing the feelings of hopelessness that CAPD patients experience.

The primary purpose of this study was to evaluate and analyze the tendency of depression among CAPD patients, which was reported to be an important factor impacting the survival and prognosis in patients on dialysis. Then we studied the influence of demographic factors on the degree of depression. Lastly, we attempted to obtain therapeutic implication by analyzing various psychological factors affecting depression among CAPD patients.

PATIENTS AND METHODS

Patients

Ninety-six patients receiving CAPD at Samsung Seoul

Hospital were studied. Sixty-three were male and 33 were female patients. The mean age of male patients was 56.4 ± 12.0 (mean \pm SD) yr and that of female patients was 53.3 ± 16.0 yr. The marital status of patients was as follows: 56 married male (88.9%) and 23 married female patients (69.7%); 3 unmarried male (4.8%) and 4 unmarried female patients (12.1%); 2 divorced male (3.2%) and 2 divorced female patients (6.1%); bereaved and separated were 2 (3.2%) and 4 patients (12.1%), respectively. The mean dialysis periods in male and female patients were 20.3 ± 16.1 months and 29.0 ± 28.7 months, respectively.

Clinical parameters

To assess the severity of physical symptoms in CAPD patients, we measured the serum albumin, hemoglobin (Hb), blood urea nitrogen (BUN), and creatinine (Cr) as clinical parameters.

Korean CES-D scale (Center for Epidemiologic Studies Depression Scale)

CES-D scale was designed by Radloff (19) and translated to Korean by Chon and Lee, and measures depressive symptoms with 20 questions (20). The internal consistency of Korean CES-D among adults over the age of 18 yr was reported as $\alpha = 0.89$. The scale runs from 0 to 60 and the higher scores indicate more severe depression. The internal consistency in this study was high ($\alpha = 0.91$).

Beck Hopelessness Scale (BHS)

This scale was developed in order to evaluate negative expectancies about the future (21). It was translated to Korean by Shin and Park and consisted of 20 true-or-false questions (22). The internal consistency of Korean Hopelessness Scale (α) was reported as 0.81 (22). The possible range of score is from 0 to 20 and higher scores indicate more severe sense of

hopelessness. Internal consistency in this study (α) was 0.92 and the item-total correlation coefficient was 0.30-0.46.

Internal individual stress scale

After interviewing CAPD patients, we made internal individual stress scale which included 3 questions related to diet, sleep, and sexual life. The score for each question ranges from 0 points (absence of stress) to 10 points (extremely stressful) and the higher scores indicate more severe stress.

Statistical analysis

All results were expressed as mean \pm standard deviation (SD), when appropriate. Comparison between groups was performed using independent t-test and correlation between parameters was calculated using Pearsons correlation coefficient. We performed a stepwise regression analysis to investigate whether each factor could explain depression.

RESULTS

Degree of depression and hopelessness

We investigated the degree of depression and hopelessness in the patients. Seventy-one patients (75%) reported that they had depression. Cut-off value was 16 (20, 23). And their experience of depression was more than the moderate degree (CES-D score: 25.0 ± 11.4) (24). Moreover, they reported the hopelessness of a very severe degree (BHS score: 11.8 ± 6.0), which was greater than reported mean value by more than 2 standard deviation (22, 25).

Comparison between genders of depression and related factors

We investigated on the gender difference of depression and other psychological factors experienced by CAPD patients. No

Table 1. Comparison of depression and other parameters according to gender

	Male	Female	p value
No.	63	33	
Depression (CES-D score)	23.9 ± 11.4	27.2 ± 11.5	>0.05
Hopelessness (BHS score)	12.3 ± 5.9	11.0 ± 6.0	>0.05
Internal individual stress	5.0 ± 2.8	5.6 ± 2.3	>0.05
Age (yr)	56.4 ± 11.9	53.3 ± 15.8	>0.05
Number of family members	2.7 ± 1.3	2.1 ± 1.7	>0.05
Duration of dialysis (weeks)	81.4 ± 64.7	116.1 ± 114.8	>0.05
Frequency of dialysis (/day)	3.4 ± 0.6	3.0 ± 0.8	>0.05
Albumin (mg/dL)	3.4 ± 0.5	3.6 ± 0.4	>0.05
Hemoglobin (g/dL)	11.1 ± 4.0	10.2 ± 1.5	>0.05
BUN (mg/dL)	55.6 ± 16.7	49.0 ± 18.7	>0.05
Creatinine (mg/dL)	9.9 ± 3.9	8.2 ± 2.3	>0.05

Table 2. Comparison of patients according to depression

	Patients with depression (CES-D score \geq 16)	Patients without depression (CES-D score < 16)
No.	71	25
Hopelessness (BHS score)	$12.8 \pm 5.4^*$	$8.6 \pm 6.5^*$
Internal individual stress	$5.6 \pm 2.5^*$	$3.3 \pm 2.3^*$
Albumin (mg/dL)	3.4 ± 0.5	3.6 ± 0.38
Hemoglobin (g/dL)	11.0 ± 3.7	10.3 ± 1.9
BUN (mg/dL)	52.0 ± 18.5	57.3 ± 14.3
Creatinine (mg/dL)	9.3 ± 3.5	9.4 ± 3.5
Duration of dialysis (weeks)	100.6 ± 86.5	71.2 ± 81.1
Frequency of dialysis (/day)	3.3 ± 0.6	3.0 ± 0.9

*p<.05 by t-test.

Table 3. Correlations among factors associated with depression

	Depression	Hopelessness	Stress	Albumin	Hemoglobin	BUN	Cr	Duration of dialysis
Depression								
Hopelessness	.509**							
Stress	.546**	.289**						
Albumin (mg/dL)	-.071	-.178	.034					
Hemoglobin (g/dL)	.060	.078	.047	.094				
BUN (mg/dL)	-.067	-.041	.163	.345**	.045			
Creatinine (mg/dL)	-.053	-.106	.127	.245*	.001	.459**		
Duration of dialysis (wks)	.214*	.134	.065	.035	-.046	.069	.048	
Frequency of dialysis (/day)	.152	.118	.194	-.036	.110	.008	.299**	.337

* $p < .05$, ** $p < .01$, by Pearson's correlation analysis.

Table 4. Stepwise regression analysis of depression in CAPD patients predictor variables

Predictor variables	R	R ²	R ²	F
Internal individual stress	.540	.292	.292	33.001*
Hopelessness	.650	.422	.130	17.793*

* $p < .01$.

significant gender differences in the psychological factors such as depression, hopelessness, and internal individual stress were found. Demographic factors such as duration of dialysis, age, and clinical parameters including albumin, Hb, and BUN also showed no gender differences (Table 1).

Comparison of patients according to depression

We compared the difference between the patients who experienced depression (CES-D score over 16) and who did not (CES-D score less than 16) (Table 2). The patients with depression experienced higher degree of hopelessness and suffered from more severe internal individual stress.

Analysis of factors associated with depression

Correlation analyses were performed to identify the factors being associated with depression (Table 3). Depression was significantly correlated with hopelessness and internal individual stress. However, there was no significant correlation between depression and demographic factors including age and frequency of dialysis except the dialysis duration. Depression was not significantly correlated with clinical parameters including albumin, Hb, BUN, and creatinine.

We performed a stepwise regression analysis to investigate how well each psychological factor can be used to explain depression (Table 4). We introduced depression as a dependent variable. Depression was best explained by internal individual stress (29.2%), followed by hopelessness (13%). On the contrary, factors such as age, duration of dialysis, frequency of dialysis, and other clinical parameters could not explain depression very well. Clearly, the depressive mood experienced by

CAPD patients was better explained by psychological factors than demographic or clinical parameters.

DISCUSSION

Depression is the most common psychological problem in patients with ESRD. Several studies have estimated that depression occurs in 20% to 49% of dialysis patients and the majority of these patients were on hemodialysis (6, 26, 27).

More attention has been paid on the impact of psychological factors on the outcome of patients with ESRD recently (28, 29). As renal insufficiency progresses, patients may experience symptoms that may affect their daily lives. And hemodialysis and peritoneal dialysis can only partially correct these symptoms and cause additional changes in the patients lifestyle (3). Analyses of factors that may affect the quality of life in dialysis patients, such as age (30), sex (31, 32), race, anemia (33), nutrition (34), glomerular filtration rate (31, 33), dialysis technique and efficacy (8, 9), social factors, and depression (35) have been performed. Among them, depression is generally accepted as one of the most important factors that affect the survival and prognosis of dialysis patients. Several studies have shown a relationship between depression and mortality in dialysis patients (13, 15, 36). Kimmel and colleagues suggested that possible mechanisms underlying the effect of depression on survival include changes in nutritional status, direct and indirect changes in the components of the immune system, and effects on compliance with the treatment regimen and that depression may be a marker for other unaccounted mortality risk factors, such as unhealthy behavior patterns (5).

There have been few reports about depression in CAPD patients. Wuertth and colleagues reported that CAPD patients with severe depressive symptoms have greater rate of peritonitis than those with mild symptoms (37). They also tried to screen depression in peritoneal dialysis patients with a questionnaire. Some patients were prescribed antidepressant medication with improvement of depression but the result was not compared with control group (38).

Although many previous studies considered depression as

an important factor that influences patients survival, they were not successful in measuring or controlling clinical factors that could reflect the severity of disease. In this study, we investigated the degree of depression in CAPD patients and tried to find therapeutic implication by analyzing various factors known to be related to depression.

Our descriptive statistical analysis of 96 CAPD patients revealed that 70% of patients experienced depression and a substantial number of patients experienced depression of more than moderate degree. In addition to these results, the CAPD patients tended to have more negative thoughts about their future than the general population (25).

The sense of hopelessness is closely associated with certain cognitive aspects including negative expectancies about the future and suicidal idea (17, 39). In this study, the depression in CAPD patients was well explained by psychological factors such as hopelessness and internal individual stress. However, there was no significant correlation between depression and demographic factors including age, gender, frequency of dialysis, and clinical parameters. The duration of dialysis which was significantly related to depression could not explain depression sufficiently. Although Kim et al. (40) reported that the depression in dialysis patients was well explained by objective economic status, our study failed to prove it.

Since several studies reported that the female chronic renal failure patients have lower scores on quality of life than the male ones (31, 41) and depression can be a factor affecting quality of life, we investigated on the gender difference of depression. We could not find any difference in depression as well as several clinical parameters.

In conclusion, our study confirmed the prevalence of depression among the CAPD patients and found that depression among the patients was mainly influenced by psychological factors. This study was a cross-sectional one and further prospective study with or without actual therapeutic intervention of depression may be needed in the future. It also remains as a topic of further investigation, whether reducing depressive symptoms would in fact result in improving patients' overall survival.

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