

Prevalence and risk factors of depressive symptoms among dialysis patients with end-stage renal disease (ESRD) in Khartoum, Sudan: A cross-sectional study

Habab Khalid Elkheir¹, Arwa Siddig Wagaella², Safaa Badi³, Abbas Khalil⁴,
Tarig Hassan Elzubair⁵, Atif Khalil⁶, Mohamed H. Ahmed⁷

¹Department of Clinical Pharmacy, Faculty of Pharmacy, Omdurman Islamic University, and Faculty of Pharmacy University of Sciences and Technology (UST), Khartoum, ²Clinical Pharmacy Program, Graduate College, Omdurman Islamic University, Khartoum, ³Clinical Pharmacy Department, Faculty of Pharmacy, Omdurman Islamic University, Khartoum, Sudan, ⁴Department of Medicine, Arrowe Park Hospital, Liverpool, UK, ⁵Department of Psychiatry, University of Sciences and Technology (UST), Khartoum, Sudan, ⁶Department of Nephrology, Noble Hospital, Isle of Man, ⁷Department of Medicine and HIV Metabolic Clinic, Milton Keynes University Hospital NHS Foundation Trust, Egelstone, Milton Keynes, Buckinghamshire, UK

ABSTRACT

Background: Depression is the most common prevalent psychiatric condition among patients with chronic kidney disease (CKD), and especially during dialysis. This study aimed to evaluate depression symptoms in Sudanese patients with end-stage renal diseases (ESRD) who undergo hemodialysis. **Methods:** This is a case finding, hospital-based study recruited 75 patients on dialysis in Khartoum, Sudan. Data were analyzed by statistical package for social science (SPSS, version 23). **Results:** The percentage of depression symptoms that satisfies the criteria for the diagnosis of major depression disorders in patients with ESRD undergoes dialysis was 68%. The new patients who undergo dialysis for less than 1 year had more depression symptoms (66.7%) than those on dialysis for 2–3 years (21.6%) or more than 3 years with a percentage of 11.8%. Chi-square test showed significant associations between depression and age, the duration of dialysis, signs of significant weight loss when no dieting, and when the clinical symptoms related to distress or social or functional impairment ($P=0.016, 0.000, 0.004, \text{ and } 0.000$, respectively). Logistic regression test showed that age and duration of dialysis were significantly associated with depression with (odds ratios [OR]: 0.724, 0.211) **Conclusion:** More than two-thirds of patients on dialysis have depressive symptoms. Risk factors associated with depression in Sudanese patients on dialysis were age, duration of dialysis, weight loss, and social and functional impairment. Future research is needed in order to assess the benefit of antidepressants in patients on dialysis. Family physicians should be aware of the association between depression and dialysis, in order to provide early treatment and prevent suicide.

Keywords: Depressive symptoms, dialysis patients, end-stage renal disease (ESRD), Khartoum, Sudan

Introduction

Chronic kidney disease (CKD) can be associated with a depressive symptom that may necessitate the need for intervention and support from a psychologist/psychiatrist especially during dialysis.^[1] Worldwide, it is estimated that 5–10 million die every

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How to cite this article: Elkheir HK, Wagaella AS, Badi S, Khalil A, Elzubair TH, Khalil A, *et al.* Prevalence and risk factors of depressive symptoms among dialysis patients with end-stage renal disease (ESRD) in Khartoum, Sudan: A cross-sectional study. *J Family Med Prim Care* 2020;9:3639-43.

Address for correspondence: Dr. Mohamed H. Ahmed,
Department of Medicine and HIV Metabolic Clinic, Milton Keynes
University Hospital NHS Foundation Trust, Buckinghamshire, UK.
E-mail: Mohamed.Hassan-Ahmed@mkuh.nhs.uk

Received: 11-01-2020

Revised: 26-02-2020

Accepted: 30-03-2020

Published: 30-07-2020

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1229_19

year from kidney disease.^[2] Importantly, depression is a common health problem across the globe and lifetime risk of 7% and females have twice the chance of having depression more than males.^[3,4] The World Health Organization (WHO) estimated that 4.4% of the world population has depression and incidence on the rise. For instance, the WHO estimated that incidence increased by 18.4% between 2005 and 2015.^[5]

Several studies showed an association between CKD and depression.^[6] This can be attributed to many factors such as poor physical activity, loss of family income, and leading role in the family, in addition to the dietary restriction. This may negatively influence the quality of life of the individuals.^[7] It worth mentioning that dialysis may influence cognitive function.^[8] Several studies associated depression with CKD and more prevalence was noted during dialysis.^[6,8] In particular, the incidence of mental disorders with CKD can range from 19% to 60% exceeding mental disorders with heart failure and diabetes.^[9] It was estimated that around 12–52% of patients on hemodialysis experience anxiety, depression, and a decrease in quality of life during dialysis, and some cases may lead to an increase in mortality.^[10] Therefore, it's not surprising that depression was a significant predictor of mortality in the dialysis population.^[11] This can be attributed to the fact dialysis restrict physical activity, certain foods, ability to work, interaction with family, and the ability to work.^[4,7,12]

Another important point in ESRD and dialysis and depression is the fact that significant decline in cognitive function was independent of age, sex, race, and functional-status trajectory before the initiation of dialysis.^[13] In one study in Saudi Arabia 24.2% of patients suffered with symptoms of major depression, however no one of the patients had been given anti-depressant medication, as patients received counseling.^[14] Several studies have shown evidence of benefits of starting anti-depressant treatment.^[10,12,15,16,17] Therefore, this study was designed to assess depressive symptoms in Sudanese cohort of ESRD on dialysis in an effort to deliver quality treatment of their mental health in the future.

Methodology

This study was a descriptive cross-sectional, hospital-based study. The study was conducted in Sudan in the Association for Renal Transplantation Center, which is one of the biggest centers for nephrology in Khartoum State, from February to March 2016.

Sample size and sampling method

The study samples were 75 patients with ESRD undergoing dialysis attending the center during the study period and agreed to participate in the study.

Inclusion and exclusion Criteria

All patients with ESRD attended the center for dialysis within the time of study and agreed to participate in the study were

included. Patients with drug abuse, or a general medical condition (e.g. hypothyroidism) or any condition that may precipitate depression were excluded from the study.

Data collection method

We used Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR) Criteria for Major Depressive Episode^[1] (further information can be obtained directly from reference 1). DSM-IV classifies the severity of MDD episodes as “mild,” “moderate,” or “severe.” These severity subtypes rely on three different measures of severity: number of criteria symptoms, the severity of the symptoms, and degree of functional disability.^[2]

Data analysis

Data were analyzed by statistical package for social science (SPSS), version 23, Chicago, USA. *P* value was set as significant ≤ 0.05 at confidence interval 95%. We used descriptive statistics (frequency tables) as well as inferential statistics (Chi-square test).

Ethical considerations

Approval for the study was obtained from Sudan Association for Renal Transplant. Ethical clearance was obtained from Omdurman Islamic University, faculty of pharmacy (20-01-2016).

Results

Demographic and disease characteristics of the study participants

The sample size in this study was 75 patients, about one-third of them aged more than 50 years, 16% aged 26–30 years and only 2.7% aged 16–20 years. 60% were males. more than half of the participants (53.3%) had hypertension, only 2.7% had diabetes while 26% have no other comorbidities. the majority of them (89%) were scheduled for three dialysis sessions per week while only 9% were scheduled for two sessions [Table 1]. The duration of the dialysis was less than 1 year in 48% of the participants and more than 3 years in 22.7% of them. About 45.3% of the participants were taking Iron injection replacement, heparin, erythropoietin, folic acid, alfacalcidol, calcium, and Vitaferron. Most of them were taking from 6 to 7 medications per day for the ESRD.

The prevalence of depressive symptoms among the studies participants

According to the DSM-IV-TR criteria for major depressive episodes, we found that 68% of the participants were depressed while 32% were not. Furthermore, only five (9%) of 75 participants reported that they had a previous psychiatric illness and we found that, all of them have depressive symptoms. About two-thirds of the participants suffered from weight loss when no dieting, while 43% reported that there are signs of psychomotor agitation observed by others, about 85% of them suffered from

depressed mood, 86.3% suffered from loss of interest and insomnia. While more than three-quarter participants suffered from diminished ability to think or concentrate. Interestingly, nearly two-thirds of the participants stated that the symptoms cause clinically significant distress or impairment in social occupational or other functioning areas [Table 2]. Regarding the numbers of depressive symptoms among the participants, 19.6% had 5 depressive symptoms, 29.4% had 6. While 23.5% had 7 depressive symptoms while only 11.8% had 8 symptoms and 15.7% has 9 symptoms.

Chi square and logistic regression test

Chi-square test showed that there were significant associations between depression and age, the duration of dialysis, signs of significant weight loss when no dieting, and when the symptoms cause clinically significant distress or impairment in social occupational or other functioning areas ($P = 0.016, 0.000, 0.004,$ and $0.000,$ respectively). Logistic regression test showed that age and duration of dialysis were significantly associated with depression with (OR: 0.724, 0.211 respectively) that means younger patients were more depressed than the older ones, and when the duration of dialysis was less than 1 year were more depressed than those with the dialysis duration of more than 3 years. Males were more depressed than females by 1.4 times [Table 3].

Discussion

68% of study populations (51 patients) satisfied the DSM-IV-TR Criteria for Major Depressive Episode.^[1,16] More than half of the study population considered as patients with MDD and this may be attributed to the stressful life events like undergoing continuous dialysis, having fixed fistula, diet, and water-intake restrictions. Importantly, The prevalence of depressive symptoms in patients with ESRD and dialysis in India was 44.1% and China was 29%.^[18,19] Other studies showed a higher prevalence of depression among hemodialysis patients. For instance, the prevalence in Saudi Arabia was 83% and in other parts of India was 83.5%.^[20,21]

In this study, the duration of dialysis was significantly correlated with depression with a P value = 0.000 where patients newly undergoing dialysis were more depressed than those on longer-term dialysis. This result similar to the result of the previous study conducted in Connecticut State in the USA.^[9] The possible reasons for higher depression scores in this study can be attributed to the restriction associated with the time of dialysis, the cost of medications and the emotional burden of not able to work. However, the patients spent more than 1 year on dialysis they feel more adapted to this; so they become less depressed than those starting dialysis less than 1 year ago. Age in this study was significantly associated with depression with a P value = 0.000. The younger patients were more depressed than others and this obviously related to the concern about the nature of the course of ESRD and dialysis and complications.

Despite the fact that depression in this study was not significantly associated with co- comorbidities in dialysis patients,

Table 1: Demographic and disease characteristics of the study participants (n=75)

Variables	Percentage
Age:	
16-20 years	2.7
21-25 years	14.7
26-30 years	16
31-35 years	13.3
36-40 years	9.3
41-45 years	2.7
46-50 years	9.3
>50 years	32
Gender	
Males	60
Females	40
Comorbidities:	
Hypertension	53.3
Diabetes mellitus	2.7
None	26.7
Hypertension + diabetes	14.7
others	2.6
Number of dialysis sessions per week:	
one session	1.4
two sessions	89.3
three sessions	9.3
The duration of dialysis:	
<1 year	48
1-3 years	29.3
>3 years	22.7

Table 2: The prevalence of depressive symptoms among the studied participants (n=75)

Symptoms of depression	Percentage
Depressed mood	84.3
Loss of interest or pleasure	86.3
Significant weight loss when not dieting or weight gains	64.7 (weight loss)
Insomnia or hypersomnia nearly every day	86.3 (insomnia) 2.0 (hypersomnia)
Psychomotor agitation or retardation nearly every day (observed by others)	43.1
Fatigue or loss of energy nearly every day	80.4
Feeling of worthlessness or excessive or inappropriate guilt nearly every day	86.3
Diminished ability to think or concentrate or indecisiveness nearly every day	78.4
Recurrent thought of death (not just fear of dying, recurrent suicidal ideation without a specific plan, or suicide attempt	56.9
The symptoms cause clinically significant distress or impairment in social occupational or other functioning areas	61.3

hypertension was found to be associated with depression as it was found in more than half of the participants. Diabetes is one of the important causes of ESRD,^[15] and was found to be associated with depression in dialysis patients. Due to the small size of individuals with diabetes in this study, diabetes was not associated with depression in patients with dialysis. It worth mentioning that none of the patients identified with depression received any

Table 3: Predictors for depression among dialysis patients by using logistic regression test (n=75)

Variables	B	S.E.	χ	P	Odds ratio
age	-0.323	0.144	5.044	0.025	0.724
Gender	0.330	0.643	0.264	0.608	1.391
Duration of dialysis	-1.557	0.425	13.399	0.000	0.211
Dialysis sessions per week	0.057	0.895	0.004	0.949	1.059
Constant	4.985	2.328	4.585	0.032	146.209

treatment for depression. Despite dialysis can improve physical activity and cognitive function, it should not be viewed as a treatment of depression.^[9,17-21] The use of antidepressants in treatment is important. In Canada, the use of antidepressants for depressed dialysis patients was associated with an improvement in depressive symptoms in more than 70% of patients^[10] to improve their QOL and help them to return to their normal life.

This study is not without limitations. The cross-sectional design may not allow for the temporal relationship for the potential risk factors and outcomes. The study may not represent all Sudan as recruitment of patients was not from all areas in Sudan and large sample size may allow for a more accurate estimation of prevalence and risk factors. Despite these limitations, the study is novel and its findings reflect the strong association between dialysis and depression and risk factors.

Conclusion

This study reflected a high incidence of depression symptoms among dialysis patients (more than two thirds the participants) with some patients having serious symptoms that necessitate urgent treatment. There were significant associations between depression and age, the duration of dialysis and signs of significant weight loss. Assessment of depression status should be performed as part of the routine practice in patients with ESRD and undergoing dialysis. Those diagnosed with depression should receive prompt treatment.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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