ORIGINAL RESEARCH PAPER
Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

TO ASSESS ANXIETY AND DEPRESSION IN PATIENTS UNDERGOING MAINTENANCE HAEMODIALYSIS

Nephrology

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ABSTRACT

BACKGROUND: Chronic Kidney Disease has been increasing worldwide, so is the number of patients undergoing maintenance haemodialysis. They have a higher prevalence of psychiatric co morbidities like depression and anxiety. However these problems remain undiagnosed and under treated. This study aim was to assess anxiety and depression in patients undergoing maintenance haemodialysis and also to assess the socio demographic variables.

METHOD: This cross-sectional study enrolled 110 patients >18 years on maintenance haemodialysis. Their symptoms was assessed using Hospital Anxiety Depression Scale (HADS) and other psychiatric co morbidities was assessed using M.I.N.I International Neuropsychiatric interview. Socio demographic data was also collected.

RESULTS: Of 110 subjects 61.8 % had depressive symptoms and 54.5 % had anxiety symptoms. Depression and anxiety was significantly associated with abnormal BMI. In multivariate logistic regression depression was statistically associated with female sex and lower number of haemodialysis. It was also found that depressive symptoms were common in patients whose number of haemodialysis was lower. It was also found that suicidality was associated with depressive and anxiety symptoms.

Conclusion: Depression and anxiety symptoms are common in patients undergoing Haemodialysis. They are all the cause of increase in suicidality in these patients. It was also found that female sex and patients who had lesser number of haemodialysis sessions have more depression and anxiety symptoms.

KEYWORDS

Depression, anxiety, haemodialyis

1.1INTRODUCTION

Chronic Kidney Disease has been increasing worldwide due to growing prevalence of diabetes and Hypertension worldwide.1 Depression and Anxiety are common psychiatric problems in patients with ESRD.2 Approximately 20-25% of patients suffering from chronic medical problems also experiences clinically significant psychological symptoms.3Haemodialysis is a practical treatment for kidney failure and has increased survival rate of patients with Chronic Kidney Disease. But this method imposes restrictions in all dimensions of life. An average haemodialysis session takes approximately 3-5 hours and will occur 3 times per week.4It will consume significant proportion of patients' time.4

Dialysis patients also have to adhere to controlled diet, limit fluid intake and follow a complex regime of medication. There are many dietary restrictions which include protein, protein, potassium, sodium , calcium and phosphorous. If these symptoms are not restricted they have a risk of fluid overload.5There is always a feeling of handicap, psychological strain of awareness of impending death and many such factors impede normal life.6 As the patients survival rate also increased with better medical treatment ,their depressive and anxiety symptoms increased over time.6,7 The incidence of anxiety is a common disorder in haemodialysis patients is 27-46%.6,7,8Suicide may be the end result of depression. It was also found that depression was significantly correlated with low BMI. Depression have more common suicidal ideation and poorer quality of life.6

Currently the relationship between depression, suicide and anxiety remains poorly understood. Objective of this study was to assess the symptoms of anxiety and depression in patients undergoing maintenance haemodialysis.

1.2 Materials and Methods

Study Population

A hospital based cross sectional study was conducted in Haemodialysis Unit of Department of Nephrology, Amrita Institute of Medical Science ,Kochi from the year August 2014- August 2016.The sample size was calculated based with a prevalence of 33.3 % reported in an urban population in Lucknow6. The sample size was estimated to be 110 with 95% confidence interval and 20% allowable error. Patients who has underwent at least one haemodialysis and who is above the age of 18 years was enrolled in the study. Patients who were able to read and write English or Malayalam were included. Patient who already had a past history of psychiatric diagnosis was excluded from the study. Written informed consent was obtained from each patient before participation. This study was approved by the ethical and research committee of AIMS Kochi to use human subjects in the research study.

Procedures

In this cross- sectional study all Haemodialysis patients underwent psychiatric diagnostic interview using M.I.N.I(M.I.N.I International Diagnostic Interview). Depressive and Anxiety Symptoms were assessed using HADS (Hospital Anxiety and Depression Scale). A semi structured proforma was used to record information regarding demographic and clinical details of the subjects.

M.I.N.I(M.I.N.I .International Neuropsychiatric Diagnostic Interview)

M.I.N.I is a short structured diagnostic interview for psychiatric disorders. This modules uses specific questions to assess various psychiatric disorders. Suicidality is also assessed using M.I.N.I. It has been used reliably for multicentre clinical trials, epidemiological studies, outcomes research as well as in non research clinical settings.9 M.I.N.I has been translated into Malayalam and has been validated. It was done as a part of Collaborative Research Unit activities Institute of Psychiatry, London and Amrita Institute of Medical Sciences, Ernakulam following principles of back translation. It was done by Dr CT Sudhir Kumar, Dr Dinesh N , Dr Sandhya Cherkilel.et.al and was published in Kerala Journal of Psychiatry.

Hospital Anxiety and Depression Scale(HADS)

HADS- is a 14 item questionnaire for assessing the severity of depression.10 The HADS is commonly used in clinical practice and primary care, and for general population. Seven items assess anxiety and seven items assess depression. Each items has four possible response(scored 0-3):the anxiety and depression subscales are independent measures. Patient with anxiety scores(HADS-A) ≥8 are

diagnosed as having anxiety symptoms (sensitivity :0.89:specificity :0.75) and patients with depression scores (/HADS-D) ≥ 8 are diagnosed as having depressive symptoms.10 English and Malayalam version of HADS was used as a license to use the same was obtained from respective organization by the Department of Psychiatry.

1.3STATISTICALANALYSIS

Data were analyzed using SPSS version 20 statistical software. Statistical software variables are expressed using frequency and percentage. Numerical variables were assessed using mean and Standard Deviation. A HADS score >8 is the dichotomous cut off for significant depression or anxiety symptoms. To check whether age is comparable or not between depressed and non depressed group two sample t test was used .Multivariate analysis was performed to find out the most significant factor of depression and anxiety.

1.4 RESULTS

Out of 110 subjects 67(60.9) were males and 43(39.1) were females. Minimum and maximum age of patients were 22 and 83 respectively. Mean Age of patients was 55.84 ± 14.23.In this study majority of the subjects were married 60 (54.5%) and lived in a nuclear family 46 (41.8%). Majority of the subjects had a secondary level of education 44 (40%) and more than half of the subjects were unemployed 77(70%). Majority of the subjects had a higher family income (Rs 20,000 per month) and majority 70 (63.7%) had a normal BMI. The sociodemographic data is summarized in Table 1.

Out of 110 subjects 68 had depressive symptoms (HADS score ≥8) . Mean HADS-D score was 10.23 ±4.83.Mean HADS score of males was 8.69 ± 4.38.Mean HADS-D score of females was 12.63 ± 4.56.Out of 67 males 32 (47.8%) had depressive symptoms and out of 43 females 36 (83.7%) had depressive symptoms There was statistically significant association between gender and depression (p value <0.001). Out of the 46 living in a nuclear family 22 (47.8 %) had depressive symptoms . Out of the 20 subjects who were living in a joint family 13 (65%) had depressive symptoms. All 8 subjects who were living alone had depressive symptoms. Out of 36 subjects who was living in other conditions 25 (69.4%) had depressive symptoms . There was a statistically significant association between type of family and depression (p value-0.0021). Out of the 25 subjects who had family income < Rs 10,000 per month 22 (88%) had depressive symptoms . Out of the 42 subjects who had income between Rs 10,000-Rs 20,000 per month 21 (50%) had depressive symptoms . Out of the 43 subjects who had family income of more than Rs 20000 per month 25 (58%) had depressive symptoms. There was a statistically significant association between family income and depression (p value 0.007). Out of 19 subjects who had underwent haemodialysis of < 49 times 17 (89.5%) had depressive symptoms . Out of 16 subjects who had 50 -99 number of haemodialysis 12(75%) had depressive symptoms and 4 (25%). Out of the 75 subjects who had underwent >100 haemodialysis 39 (52%) had depressive symptoms . There was statistically significant association between depression and number of haemodialysis (p value <0.006).Out of 25 subjects who had BMI of <18.5 all 25 (100%) had depressive symptoms. Out of 70 subjects whose BMI is between 18.5-24.9, 33(47.1%) had depressive symptoms . Out of 15who had BMI ≥ 25, 10 (66.7%) had depressive symptoms . There was statistically significant association between depression and BMI (p value <0.001). Among sex, Marital status ,type of family ,number of haemodialysis and BMI ,only female sex(OR-4.98 with 95% confidence interval with lower limit of 1.83 and upper limit of 13.05;p value-0.002) and lower number of haemodialysis(OR—2.50 with 95% confidence interval with lower limit -1.22 and upper limit - 5.13; p value-0.012) was statistically significant in multivariate logistic regression analysis. The association of sociodemographic variables with depression is summarized in Table 2.

Out of 110 subjects undergoing maintenance haemodialysis 60 had Anxiety (HADS score ≥ 8). Mean HADS– A score was 8.59 ± 3.77.Mean HADS –A score of males was 7.81± 3.61 and Mean HADS –A score of females was 9.81±3.68.Mean age of the Anxious patients was 55.77± 14.23. Out of 67 males 30(44.8%) had anxiety symptom. There was a statistically significant association between anxiety symptoms and gender. (p value-0.010). Out of 19 subjects who had underwent haemodialysis <49 times 12 (63.2%) had anxiety symptoms. Out of the 16 subjects who underwent haemodialysis about 50 -99 times 13(81.2%) had anxiety symptoms . Out of 75 subjects who had underwent haemodialyis more than 100 times 35 (46.7%) had anxiety symptoms. There was statistically significant association between anxiety and number of haemodialysis (p value- 0.029). Out of 25 subjects who had BMI of <18.5 21 (84%) had anxiety symptoms . Out of the 70 subjects whose BMI was between 18.5-24.9 30 (42.9%) had anxiety symptoms. Out of 15 who had BMI ≥25 9 (60%) had anxiety symptoms. There was statistically significant association between BMI and anxiety (p value<0.002).

The association of sociodemographic variables with anxiety is summarized in Table 3.. Compared with non anxious patients subjects with anxiety had a statistically significant association with gender, BMI and number of haemodialysis. Among multivariate logistic regression it was found that female sex(OR-2.846 with 95 % confidence interval with lower limit of 1.26 and upper limit of 6.39; pvalue-0.011) was statistically significant. In this study using M.I.N.I it was found that out of 110 subjects only 6(5.5%) had mania, only 6 (5.5%) had panic disorder, only 3 (2.7%) had agoraphobia and 5(4.5%) had social phobia.OCD symptoms was found in 10 (9.1%) and Post traumatic stress disorder symptoms was found in4 (3.6%)subjects. It was also found out of 110 subjects 3(2.7%) had features of alcohol dependence and 10 (9.1%) had features of abuse. It was also found that 13 (11.8%) subjects had features of abuse, and 3 (2.7%) had features of psychotic symptoms. The frequency distribution of all other psychiatric co morbidity in patients undergoing maintenance haemodialysis using M.I.N.I is summarized in Figure 1. It was found that the prevalence of all other psychiatric co morbidity was lower when compared to Depression and Anxiety. In our study it was also found that out of the 38 subjects who had suicidality all were depressed. There was a statistically significant association between depression and suicidality (p value -<0.001). It was also found that out of the 38 subjects who had suicidality 73.7 % had anxiety. There was a statistically significant association between anxiety and suicidality (p value- 0.003)

1.5 DISCUSSION

This study was undertaken in the background evidence that prevalence of Chronic Kidney Disease and patients undergoing maintenance haemodialysis has been increasing worldwide. Though studies have been done in India to assess the depression in these patients , most of the studies haven't looked into other psychiatric co morbidity in these subjects.

The WHO World Mental Health (WMH) surveys on the global burden of mental disorders, 2009, concluded that, the lifetime prevalence of mood disorders and anxiety disorders are approximately 12% and 16% respectively.11In our study using Hospital Anxiety Depression Scale(HADS) 61.8 % had score of ≥8 in depressive subscale. In a similar study bone by Patel.e.al in Lucknow had 33.3 %had depressive symptoms.6In another study by Chen et.al had 35 % had depressive symptoms.2Mean HADS-D score was 10.23±4.83 (0- 21) and mean age is 56.34±13.25.In another study by Zhang.et.al showed that prevalence of depression was 39.3%.12In another study the overall meta-analysitic prevalence of depression was 22.8% in 249 individual study population and there was evidence of high level of heterogeneity. The report also showed that self report scales may overestimate the presence of depression.13The prevalence of depression in our study is higher than that observed by most of the other studies. This variability may be due to sample size, heterogeneity in CKD severity between samples and differences in scales used to assess the depressive symptoms. The Chennai Urban Rural Epidemiology Study (Cures – 70) was the largest population-based study from India to report on prevalence of depression and showed that the prevalence of depression was 15.1%.14 Thus the prevalence rates of depression in patients undergoing haemodialysis is higher than that reported in general population.

In the current study among sociodemographic factors including gender, marital status, education, type of family and income were taken into consideration. The factors which was significantly associated with depression were gender, type of family and family income. Out of the 67 males 47.8% had depressive symptoms and out of 43 females 83.7% had depressive symptoms .In the general population also generally women had higher chance of being diagnosed of Major Depressive disorder from adolescence to adulthood.15 Mean HADS –D score for males was 8.69±4.38(0-21) and females was 12.63±4.56. (0-21)

In this study it was also found that patients who were living alone were more depressed. The findings can be correlated with a similar study

done by Fischer.et.al where it was found that patients who were Living alone had 43% depression in BDI(Becks Depression Inventory) scoring.[16]

Another study done by Zalai.et.al found that the main factors which influenced the level of psychological distress are patients sociodemographic characteristics (eg. age, gender and family income) and social support.17 This might be due to the role changes within the marital dyad ,family and community level.

In this study depressive symptoms was statistically significant association with BMI. Patients who were under nourished scored more ≥ 8 in the depression subscale of HADS and among the patients who were obese only 66.7% scored ≥ 8 in the depression subscale of HADS. Patients who were undernourished or overweight had more depressive symptoms. Thus there was an association between depression and BMI. In a study by Wit.et.al done in 43,534 individuals it was found that there was a U shaped association between BMI and depression.18 It was also found that people with low BMI had more anxiety symptoms. But we should keep the fact that BMI may be affected by various other co morbid medical problems, environmental and genetic factors.

In the current study it was found that patients who had lower number of haemodialysis were more depressed than others.The findings was similar to a study done by Watnick.et. al in which 123 patients who was started on haemodialysis of which 44% patients scored ≥14 in BDI (Becks Depression Inventory).19 In multivariate logistic regression analysis, depressive symptoms were statistically associated with female sex was 5 times more depressed and subjects with lower number of haemodialysis was twice more depressed than other subjects in the study.

In our study using HADS(Hospital Anxiety Depression Scale) 54.5 %of the patients anxiety subscale ≥8 in anxiety subscale. Mean HADS - A score was - 8.59±3.77.It is similar to a study done by Chen et.al 21% had anxiety symptoms.[2]

In another study done by Lee.et.al showed that prevalence of anxiety in CKD is 27.6% and the prevalence did not differ across CKD stages.20In a similar study done by Reckert.et.al which was done in 2013 in 52 haemodialysis patients it was found that 17% had Generalized Anxiety disorder using SCID(Structured Clinical Interview for DSM5) and 23 % scored ≥7 in HADS-A.21 High prevalence of anxiety symptoms can be explained by the fact that patient attending haemodialysis have significant apprehension about the prognosis of treatment, duration of haemodialysis and anxiety concerning the financial aspects of treatment. However these aspects were not methodologically studied. Hence further research focusing on the aspects of anxiety needs to be undertaken.

In the current study among sociodemographic factors including gender, marital status, education, type of family and income were taken into consideration. The factors which was significantly associated with anxiety was gender .Among 43 females who underwent haemodialysis 69.8 % patient scored ≥8 in HADS-Anxiety subscale and among 67 males 44.8% scored more than ≥8 in anxiety subscale. Mean HADS A score for females was 9.81± 3.68 and for females was 9.81±3.68.This result does not correlate with the findings got by Lee.et.al where there was no correlation between anxiety and sociodemographic variables.20.Mean age of patients with Anxiety was 55.77±14.23.In this study it was also found that patient who had lesser number of haemodialysis (≤100) had a significant association with anxiety. In a study done by Lew.et.al to analyze psychosocial factors at the initiation of haemodialysis it was found that the lifestyle burden and losses associated with planning and initiation of haemodialysis account for these observations.22In this current study it was also found that patients with lower BMI(<18.5) scored ≥ 8 in the anxiety subscale of HADS-A and there was a statistically significant association (p value-0.002).Poor nutrition may occur due to loss of appetite. But abnormal BMI can also be attributed to Chronic Kidney Disease or other co morbid illness23.Fluid overload may occur in CKD. The findings were similar in a study done by Zhao.et.al where subjects who had abnormal BMI had more anxiety symptoms.23 In multivariate logistic regression anxiety symptoms was statistically associated with female subjects was three times more anxious than other subjects. In another study done by Livesley.et.al it is stated it showed that anxiety is more common in females.24

1.6 Limitations

As the design of the study was a cross sectional , we were unable to assess the changes in depressive or anxiety symptoms with disease progression. Secondly, though M.I.N.I and HADS has been validated for the use in patients with ESRD, it has not been validated against a gold standard psychiatric diagnosis of depression in patients with CKD. Thirdly, to meet the diagnosis, DSM-5 or ICD 10 diagnostic criteria was not used. To meet the diagnostic criteria for DSM-5,the subjects needs to fulfill the exclusion criteria as quoted in DSM 5"The symptoms are not due to direct physiological effects of a medication/ general medical condition." DSM 5 criteria may have a higher specificity but a lower sensitivity than HADS. Authors used HADS to define case of depressive disorder and anxiety disorder. Lastly subjects from this study were from a single hospital. It will be better if we recommend further research with sample from multiple hospitals.

1.7 Conclusion

It was found that anxiety and depression is the most common psychiatric co morbidity in patients undergoing maintenance haemodialysis. It was also found that females had more anxiety and depressive symptoms. By using M.I.N.I it was found that other psychiatric co morbidities prevalence rate was much lower. From this study it was also found that patients had more depressive and anxiety symptoms at the time of initiation of maintenance haemodialysis.BMI also had association with depressive and anxiety symptoms.

Depression and anxiety adversely affect the quality of life and survival of these patients. They are all treatable since patients undergoing maintenance haemodialysis are frequently seen by the doctor on a regular basis. Therefore there is no barrier in diagnosing or treating such conditions. So it is essential for the nephrologist to be aware of such symptoms in these patients. Timely treatment of such symptoms will reduce the disease progression, increases the survival rate, decreases the health care cost and increases the quality of life.

1.8 Suggestions for future research

A long-term follow up study should be conducted in order to find out more about the long-term impact of depression and anxiety in dialysis patients. Further treatment studies of depression/anxiety should be performed, and their effectiveness for symptom reduction The etiology of depression is not known, so there are few studies that support a stress and inflammation hypothesis in depression in the general population. It would be interesting to further study the relationship between stress, inflammation and depression in dialysis patients.

Further study of comorbid depression and anxiety, as well as their associations with the Quality of life of dialysis patients, is needed. Controlled clinical studies to assess coping style, social support and physical training as effective interventions for depression and anxiety are needed.

Table 1: Distribution of Sociodemographic Factors

Sociodemographic Factors	Variables	Frequency	Percentage
Sex	Male	67	60.9
	Female	43	39.1
Marital Status	Nuclear	46	41.8
	Joint	20	18.2
	Living alone	8	7.3
	Other	36	32.7
Education	Primary	26	23.6
	Secondary	44	40
	Graduate	30	27.3
	Post Graduate	10	9.1
Occupation	Employed	33	30
	Unemployed	77	70
Family Income	<1000	25	22.7
	1000-20000	42	38.2
	>20000	43	39.1
Number of Haemodialysis	<49	19	17.3
	50-99	16	14.5
	>99	75	68.2
BMI	<18.5	25	22.7
	18.5-24.9	70	63.7
	25-29.9	12	10.9
	>30	3	2.7

TABLE 3: Association of Socio demographic variables with Depression.

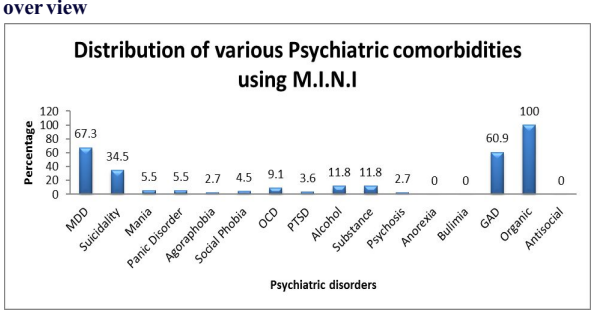
Depression							
Factor	Category	Total	Yes		No		p value
			n	%	n	%	
Gender	Male	67	32	47.8	35	52.2	<0.001
	Female	43	36	83.7	7	16.3	*
Marital Status	Married	60	36	60.0	24	40.0	0.066
	Single	20	10	50.0	10	50.0	
	Widow	16	9	56.2	7	43.8	
	Divorced	14	13	92.9	1	7.1	
Type Of Family	Nuclear	46	22	47.8	24	52.2	0.021*
	Joint	20	13	65.0	7	35.0	
	Living alone	8	8	100.0	0	0.0	
	Other	36	25	69.4	11	30.6	
Education	Primary	26	18	69.2	8	30.8	0.670
	Secondary	44	26	59.1	18	40.9	
	Graduate / Post Graduate	40	24	60	16	40	
Occupation	Employed	33	19	57.6	14	42.4	0.549
	Unemployed	77	49	63.6	28	36.4	
Family Income	<10,000	25	22	88.0	3	12.0	0.007*
	10,000-20,000	42	21	50.0	21	50.0	
	>20,000	43	25	58.1	18	41.9	
Number of haemodialysis	<49	19	17	89.5	2	10.5	0.006*
	50-99	16	12	75	4	25	
	>100	75	39	52	36	48	
BMI	<18.5	25	25	100	0	0	0.029*
	18.5-24.9	70	33	47.1	37	52.9	
	≥ 25	15	10	66.7	5	33.3	

Table 4:Association of sociodemographic variables with anxiety

Anxiety							
Factor	**Category**	**Total**	**Yes**		**No**		**p value**
			n	%	n	%	
Gender	Male	67	30	44.8	37	55.2	0.010*
	Female	43	30	69.8	13	30.2	
Marital Status	Married	60	32	53.3	28	46.7	0.993
	Single	20	11	55.0	9	45.0	
	Widow	16	9	56.2	7	43.8	
	Divorced	14	8	57.1	6	42.9	
Type Of Family	Nuclear	46	24	52.2	22	47.8	0.350
	Joint	20	8	40.0	12	60.0	
	Living alone	8	5	62.5	3	37.5	
	Other	36	23	63.9	13	36.1	
Education	Primary	26	16	61.5	10	38.5	0.715
	Secondary	44	23	52.3	21	47.7	
	Graduate / Post Graduate	40	21	52.5	19	47.5	
Occupation	Employed	33	17	51.5	16	48.5	0.676
	Unemployed	77	43	55.8	34	44.2	
Family Income	<10000	25	17	68.0	8	32.0	0.305
	10000-20000	42	21	50.0	21	50.0	0.029*
	>20000	43	22	51.2	21	48.8	
Number of Haemodialysis	<49	19	12	63.2	7	36.8	0.002*
	50- 99	16	13	81.2	3	18.8	
	>100	75	35	46.7	40	53.3	
BMI	<18.5	25	21	84	4	16	
	18.5-24.9	70	30	42.9	40	57.1	
	≥25	15	9	60	6	40	

*- means statistically significant at 5% level

Figure 1: Distribution of various psychiatric comorbidities- an over view



OCD- Obsessive Compulsive Disorder
PTSD- Post Traumatic Stress Disorder
GAD- Generalised Anxiety Disorder

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