Original Article

Study of anxiety and depression in patients undergoing maintenance hemodialysis for chronic renal failure

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Abstract

Background: End-stage renal disease (ESRD) is the most advanced stage of kidney failure in which kidney function is irreversibly lost. Incidence of ESRD have increased in recent times due to increase in life expectancy and increase in prevalence of life style diseases such as diabetes and hypertension. Renal transplant is the most ideal therapy for this disorder followed by hemodialysis. The limited availability of transplants relative to need consigns the majority of patients on dialysis. Hemodialysis (HD), typically performed in tertiary health care settings, remains the most commonly utilized modality worldwide. Patients with ESRD have to go for hemodialysis procedure on regular basis and they requires modifications related to diet, fluid control, and medication intake. In addition to the physical impairments, many HD patients face emotional challenges, particularly depression and anxiety. Depression is more common in patients on dialysis than in general population and is associated with poor prognosis. Early recognition of risk factors associated with psychiatric symptoms will improve the prognosis in this population group. This study will assess the prevalence of, and risk factors associated with depression and anxiety in patients of ESRD on maintenance HD. **Objectives:** 1.To assess prevalence of depression and anxiety in ESRD patients on chronic hemodialysis. 2. To assess factors causing depression and anxiety in ESRD patients on chronic hemodialysis. Methods: A cross sectional, observational study was conducted at B.V.D.U.M.C. & H. Sangli. Patients Of chronic renal failure who were on maintenance dialysis for more than 6 months were assessed for depression and anxiety using Beck's Depression Inventory, Beck's Anxiety Inventory. Statistical test were applied to assess the data. **Results:** As the duration of dialysis increased severity of depression increased but severity of anxiety decreased.

Key Words: anxiety and depression.

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INTRODUCTION

Depression and anxiety are common psychiatric illness in end stage renal disease patients (ESRD) receiving maintenance hemodialysis (HD). Different studies have given rates of depression between 20 – 70 % and rates of anxiety between 30 - 60 % in patients on maintenance hemodialysis[1-3]. A range between 5 – 24 % for depression in HD patients is given by chilcot *et al*. 2008[4]. A study by cukor *et al*. 2007 indicated persisting clinical anxiety at around 15%[5]. These data suggest that prevalence of depression and anxiety are higher in end stage renal disease patients than in general population. Hemodialysis patients are known to face numerous physical stressors and life style modifications. These include physical

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symptoms of pain and lethargy, specific dietary regimens, time constrains due to regular hemodialysis and change in their body image due to fluid retention. Therefore depression and anxiety are more common in such population[6]. Factors associated with depression or anxiety in HD patients are age[7], gender[8], socio-economic position[9], and marital status[10] Relationship between social support and depression has been assessed by Chan *et al*., 2011 which is strong and consistent[11]. Very little information is available about clinical and laboratory variables which may be correlated with symptoms of depression and anxiety in this population group. Presence of depression and anxiety can lead to poor adherence to treatment, increased morbidity and mortality[12]. Therefore it is important to find out factors which predispose a patient for depression and anxiety in this subpopulation. The present study is aimedat evaluating the prevalence of depression and anxiety and some demographic, clinical and laboratory variables in maintenance hemodialysis patients.

MATERIAL AND METHODS

This cross section observational study was conducted at Bharati Vidyapeeth deemed university, Bharati hospital, Sangli, Maharashtra (a), between January and February 2017. Patients with end stage renal disease who were more than 21 years old and receiving maintenance hemodialysis at bharati hospital were preliminarily screened. Exclusion criteria includes patients who were unable to give informed consent, unable to understand spoken Marathi, English, or Hindi, past history of functional psychosis or organic brain disorder, substance dependence, major sensory, motor, or cognitive impairments that may prohibit assessments, patients who are on HD for less than 6 months. The study was approved by ethics committee and written informed consent was obtained from all patients before enrolment in study. The following demographic, clinical and laboratory data were recorded for each patient at the moment of the inclusion in the study. Name, age, sex, education, employment status, marital status, Past history, family history, mental state examination, general physical examination, systemic examination,, duration of dialysis, haemoglobin, blood urea, serum creatinine, sodium, potassium, becks depression score, becks anxiety score. We enrolled 100 patients on maintenance hemodialysis, all patients were receiving hemodialysis 3 times per week. We applied Becks depression inventory, becks anxiety inventory. Becks depression inventory has 21 items that evaluate a broad spectrum of symptoms[13]. Of these items 15 refer to psychological cognitive symptoms, while remaining 6 items address vegetative somatic symptoms. Thus the instrument gives more emphasis to cognitive component of depression. The score range is from 0–63 points. Score in the range of17-20 was considered as mild depression, score between 21-30 points as moderate depression, score between 31-40 points as severe depression and score above 40 as extreme depression. Becks anxiety inventory[14] was used to assess anxiety symptoms, it comprises of 21 items. Score range from 0-36 points, where score of 0-21 was considered as low anxiety, score between 22-35 points was considered moderate anxiety and any score above 35 was considered as severe anxiety. Discrete data was assessed using Chi-square test. Continuous was assessed using ANNOVA or Student's T-test**.**

Statistical analysis was done using SPSS 22.0 software. A p value less than 0.05 was considered significant.

RESULTS

The study interviewed 110 patients on maintenance hemodialysis. 10 patients were excluded due to delirium (4), aphasia (2), and history of alcohol dependence (4). 100 patients were included in the study.

Table 1: Demographic and social characteristics of patients included in the study

Age(years)	45.09 +_ 13.54
Female	26(26%)
Male	74(74%)
Illiterate	7(7%)
Literate	93(93%)
Employed	36(36%)
Unemployed	64(64%)
Married	82(82%)
Single	18(18%)

The mean age was 45.09±13.54 years. We had 26 female patients and 74 male patients. 82 of the subjects were married, while rest were either unmarried or widow. Out of 100, 36 subjects were employed full time. Rest were partially employed or unemployed.

Table 2: Clinical and laboratory characteristics of patients included in study

	Mean ±S.D.
Hemoglobin	7.9±1.7
B. Urea	132.45 ±28.3
S. Creatinine	7.8 ±2.2
Sodium	137.97 ± 3.9
Potassium	4.46±0.77
Duration of dialysis	22.54 ± 20.06

The average time on dialysis was 22.5 ± 20.06 months. Comparing sociodemographic data between depressed and non-depressed (Chi -square test)

Table 3

		N	No depression (BDI<15)	Depression (BDI>15)	P value
Marital status	Single	18	7	11	0.043
	Married	82	53	29	
Education	Illiterate	7	4	3	0.998
	Primary education	16	10	6	
	Secondary education	19	11	8	
	Higher secondary	31	19	12	
	Graduate and above	27	16	11	
Occupation	Unemployed	64	41	23	0.269
	Employed	36	19	17	
Sex	Male	74	45	29	0.78
	Female	26	15	11	

Comparing different levels of depression with respect to illness related parameters (ANOVA test)

Table 4

		No depression	Mild depression	Moderate depression	Severe depression	Extreme depression	P value
N		60	15	14	7	4	
Age	Mean	46.32	44.4	42.86	45.00	37.25	0.69
	S.D.	13.4	18.34	11.30	11.57	5.67	
Duration of illness	Mean	12.82	27.53	33.21	62.00	43.25	<0.001
	S.D.	9.29	17.03	16.37	33.22	10.68	
Hemoglobin	Mean	8.02	7.48	7.56	8.15	8.70	0.59
	S.D.	1.91	1.08	1.30	1.80	1.21	
Na	Mean	138.17	138.27	137.43	136.14	139.00	0.69
	S.D.	3.85	3.1	3.56	6.14	6.00	
K	Mean	4.44	4.81	4.23	4.27	4.62	0.29
	S.D	0.74	0.99	0.69	0.54	0.75	
Urea	Mean	132.38	134.33	134.57	121.71	137.75	0.86
	S.D.	28.58	29.51	31.60	27.31	13.72	
Creatinine	Mean	7.77	8.36	7.39	8.12	7.4	0.81
	S.D.	2.13	3.08	2.64	0.92	1.84	

Comparing sociodemographic data between Low anxiety and Anxiety group (Chi square test)

Table 5

		N	Low anxiety	Anxiety	P value
Marital status	Single	18	15	3	0.71
	Married	82	71	11	
Education	Illiterate	7	6	1	0.98
	Primary school	16	14	2	
	Secondary school	19	17	2	
	Higher secondary	31	26	5	
	Graduate	27	23	4	
Occupation	Unemployed	64	58	6	0.76
	Employed	36	28	8	
Sex	Male	74	64	10	0.75
	Female	26	22	4	

Comparing different levels of anxiety with respect to illness related parameters (ANOVA test)

Table 6

		Low anxiety	Moderate anxiety	Severe anxiety	P value
N		82	16	2	
Age	Mean	43.89	50.56	50.00	0.17
	S.D.	13.48	14.03	5.67	
Duration of dialysis	Mean	25.24	10.38	9.00	0.014
	S.D.	21.15	4.19	4.24	
Hemoglobin	Mean	7.92	8.13	5.90	0.21
	S.D.	1.61	2.06	1.55	
Na	Mean	137.90	138.12	139.50	0.84
	S.D.	4.15	3.09	0.70	
K	Mean	4.51	4.16	4.90	0.18
	S.D.	0.78	0.59	1.55	
Blood urea	Mean	133.30	131.25	107.00	0.42
	S.D.	27.53	32.29	32.52	
Serum Creatinine	Mean	7.88	7.71	6.30	0.62
	S.D.	2.38	1.85	1.27	

- Prevalence of depression was 40% and prevalence of anxiety was 18% in our study sample
- As duration of dialysis increased there was increase in BDI *(p value-0.001)* and decrease in BAI score *(p value-0.014)* which is statistically significant.
- Higher prevalence of depression was present in single (61.1%) than married (35.4 %) patients *(p value-0.043)*.
- Depression was found in 40 (40%) cases. The intensity of depression was classified as mild in 15 (15%), moderate in 14 (14%), severe in 7 (7%) and extreme in 4 (4%) cases.
- We found that 82 (82%) patients had low anxiety, 16 (16%) patients had moderate anxiety and 2 (2%) patients had severe anxiety.

DISCUSSION

According to a study by Ginieri-Coccossis M *et al*. depression is most common psychiatric illness in patients with ESRD[4]. Sleep disturbance, malaise, anorexia which are common in patients of HD can be mistaken for depressive symptoms[15]. In their meta-analysis Palmer *et al* reported a wide range in the prevalence of depressive symptoms (1.4-94%), among studies that involved dialysis patients[16]. In study by Koo JR *et al*.56.6% had BDI score >21[17]. In a study by chilcot *et al*. (2011) depressive symptoms were present in 25% (BDI > 16) of patients[18]. In the present study depression was found in 40% of patients which is comparable to previous studies. We found out that as the duration of dialysis increases severity of depression increases. Patients who were on dialysis for years had more symptoms of depression, this is an important finding which suggest need for longitudinal study. The diagnosis of depression is often missed and not addressed in patients of HD, focusing only on physical aspects of the disease.[5] Saeed *et al*. 2012 found moderate and severe depression in 75% of studied cases where as we found in 25 % of patients[19]. In a recent review the prevalence of anxiety has been reported to be around 38%[20]; rates of clinical anxiety ranging between 0% and 45%[21], these rates are higher as compared to our rates. We found out that as the duration of dialysis increases severity of anxiety decreases. This could be because of the problem with adjustment will HD at initial stages. There is lack of consensus on best assessment method[22] and variable measures and criteria used to assess/ diagnose depression or anxiety which may account for some of the variation in the observed rates. Previous studies have shown that the only risk factor for either symptoms of depression or anxiety was lack of social support and quality of social interactions[23,24]. According to previous studies marital status was not associated with either anxiety or depression[25,26] in patients on chronic HD. Our results show that chances of developing depression increases significantly in single patients as compare to married once. We did not find any association between employment status and depression which matches the result of previous studies[7]. We did not find gender, age or education as significant factor in causing depression or anxiety in patients on chronic HD. In our study there was no association found between hemoglobin, blood urea, serum creatinine, sodium and potassium level and the presence of depression or anxiety. Our study has certain limitations: We used BAI for assessing anxiety. There is no minimum cut off score in BAI for anxiety. Though severity of anxiety can be assessed using BAI, it's difficult to assess prevalence of anxiety. Our sample size was small: we had limited number of patients in our hospital that prevented us from taking large sample size. Selection bias: as the patients with significant disability were not included, this may influence the result. We did not assess other laboratory

parameters such as PTH, inflammatory markers, BMI, co-morbidities and we did a cross sectional study, it is important to follow up patients to assess change in symptoms.

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