INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

CORRELATION OF DEPRESSION LEVEL WITH LIPID PROFILE IN REGULAR HEMODIALYSIS CRONIC KIDNEY DISEASE PATIENTS

Fadly Afif Rambe [1], Habibah Hanum Nasution [2], Alwi Thamrin Nasution [3]
[1] Department of Internal Medicine, Faculty of Medicine, University of Sumatera Utara
[2] Division of Psychosomatic, Department of Internal Medicine, Faculty of Medicine, University of Sumatera Utara
[3] Division of Nephrology and Hypertension, Department of Internal Medicine, Faculty of Medicine, University of Sumatera Utara

DOI: 10.29121/ijrsm.v9.i1.2022.1

Keywords: Depression, Chronic Kidney Disease , Lipid Profile

Abstract

Introduction : Depression is widely recognized as the most common psychiatric problem in chronic kidney disease patients undergoing hemodialysis. Depression causes an increase of glucocorticoids and catecholamines hormones, resulting in impaired lipid metabolism.

Aim : This study aims to determine the correlation between depression level and lipid profile in chronic kidney disease patients undergoing hemodialysis.

Methods : This study is a cross sectional study involving 30 respondents at Haji Adam Malik Hospital Medan for the period October – November 2019. Respondents were assessed for their level of depression using the BDI (Beck Depression Inventory) and laboratory examination of total cholesterol, HDL, LDL, and triglycerides.

Results : Of all study subjects, 13 respondents (43.3%) had mild depression, 11 (36.7%) had moderate depression, and 6 (20%) had severe depression. Bivariate analysis found significant relationship between the level of depression and triglyceride levels (p = 0.046).

Conclusion : The more severe degree of depression, the triglyceride levels will tend to increase in patients with chronic kidney disease undergoing hemodialysis.

Introduction

Depression is an affective disorder characterized by a depressed mood (sad), loss of interest, and fatigue.[1] In Indonesia, with various biological, psychological and social factors with a diverse population, the number of cases of mental disorders, especially depression, continues to increase which has an impact on increasing the burden on the state and decrease in human productivity in the long term.[2]

Depression is now widely recognized as the most common psychiatric problem in patients with chronic kidney disease and is considered second to hypertension as a comorbid diagnosis in this group of patients. A large variability was observed in the studies reported, the prevalence rate of depression in patients undergoing hemodialysis from 10% to 60% depending on the demographics of the study population and the assessment tool used.[3]

Thirty-five percent of patients with chronic kidney disease have been shown to have heart disease such as chronic heart failure and left ventricular hypertrophy. The prevalence of heart failure increases at each stage of chronic kidney disease reaching 75% at the end stage.[4] Indirectly, depression can also increase the incidence of heart disease in patients with chronic kidney disease, because depression causes increased activity of the sympathetic nervous system and hypothalamic pituitary adrenal (HPA) axis that causes dyslipidemia.[5] Dyslipidemia is one of the main factors in the occurrence of heart disease. Increased levels of low-density lipoprotein cholesterol and decreased levels of high-density lipoprotein cholesterol have been shown to be associated with decreased left ventricular systolic and diastolic function, which can lead to heart disease.

INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

Considering the high prevalence of depression and heart disease in patients with chronic kidney disease, we wanted to know the correlation between depression level and lipid profile levels as a risk factor for heart disease in patients with chronic kidney failure.

Methods

This cross-sectional study was carried out on patients with chronic kidney failure on regular hemodialysis who were depressed at the hemodialysis unit of Haji Adam Malik Hospital Medan from October 2019 - November 2019.

The population of this study were patients with chronic renal failure on regular hemodialysis who were depressed according to the inclusion and exclusion criteria. The inclusion criteria in this study were age 18 years, willing to participate in the study, had undergone hemodialysis for > 3 months, and could understand the contents of the questionnaire. While the exclusion criteria in this study were patients who were taking drugs that affect lipid levels such as simvastatin, fenofibrate, etc., and patients were not willing to participate in the study.

Data collection was carried out after obtaining approval from the ethics committee. All study subjects were asked for consent to participate in the study. All study subjects included in the study were collected name, age, gender and address. Study subjects were given a Beck Depression Inventory (BDI) questionnaire consisting of 21 questions, then total cholesterol, HDL, LDL, and triglycerides were examined.

Data were analyzed using SPSS version 24. Univariate analysis was used to determine the prevalence of mild, moderate and severe depression and to determine the characteristics of the study subjects. Bivariate analysis to see the relationship between depression level and lipid profile was carried out by Chi-square test using SPSS software. The results of the analysis were significant if $p < 0.05$.

Results

All of chronic kidney failure patients who underwent hemodialysis at Haji Adam Malik General Hospital Medan in the period October 2019 to November 2019, found 30 patients with chronic kidney failure met the inclusion criteria and included in the study.

Of the 30 study subjects, 19 men (63.3%) and 11 women (36.7%). All subjects have an age range of 30 - 71 years, with an average age of 53.4 years + 10.8366. From marital status, most of the subjects were married as many as 23 people (76.7%), followed by widow/widower status as many as 5 people (16.7%), and only 2 people (6.7%) were unmarried. Most of the respondents were Javanese, as many as 11 people (36.7%), followed by Batak tribes 9 people (30%), Karo tribes 8 people (26.7%), Nias tribes 1 people (3.3%), and Mandailing tribe 1 person (3.3%).

The level of depression based on the BDI score showed that mild depression was 13 people (43.3%), moderate depression was 11 (36.7), and severe depression was 6 people (20%).

Table 1. Demographic Characteristics of Study Subjects

Karakteristik	**n**	**(%)**
Sex		
Male	19	(63,3)
Female	11	(36,7)
Age	53,4 ± 10,836	
Marrital Status		
Unmarried	2	(6,7)
Widow/Widower	5	(16,7)
Merried	23	(76,7)
Tribes		

INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

Batak Toba	9	(30)
Jawa	11	(36,7)
Nias	1	(3,3)
Karo	8	(4,5)
Mandailing	1	(3,3)
Depression Level		
Mild	13	(43,3)
Moderate	11	(36,7)
Severe	6	(20)

For the total cholesterol variable, it was found 27 respondents with normal total cholesterol levels, there were 13 (48.2%) with mild depression levels, 9 (33.3%) with moderate depression levels, and 5 (18.5%) with moderate levels of depression. Meanwhile, of the 3 respondents with increased total cholesterol levels, 2 (66.7%) had moderate depression and 1 (33.3%) had severe depression. Based on the results of the chi-square test, p value = 0.278, there is no significant relationship between the level of depression and total cholesterol.

In the high density lipoprotein (HDL) variable, it is known that from 4 respondents with normal HDL levels, 2 (50%) had mild depression, and 2 (50%) had moderate depression. There were no respondents with severe depression. Meanwhile, of the 26 respondents with decreased HDL levels, 11 (42.3%) had mild depression, 9 (34.6) had moderate depression, and 6 (23.1) had severe depression. After the chi-square test, the p value = 0.550, there is no significant relationship between the level of depression and HDL levels.

In the low density lipoprotein (LDL) variable, out of 28 respondents with normal LDL values, 13 (46.4%) had mild depression, 9 (32.1%) had moderate depression, and 6 (21.5%) with severe depression. Meanwhile, of the 2 respondents with elevated LDL, 2 (100%) had moderate depression. The results of the chi-square test obtained p value = 0.157, so there is no significant relationship between the level of depression and LDL levels

In the triglyceride variable, out of 22 respondents with normal triglyceride values, 11 (50%) had mild depression, 9 (40.9%) had moderate depression, and 2 (9.1%) had severe depression. Meanwhile, 8 respondents with elevated triglyceride values found 2 (25%) with mild depression, 2 (25%) with moderate depression, and 4 (50%) with severe depression. Based on the results of the chi-square test, p value = 0.046, then there is a significant relationship between the level of depression and triglyceride levels.

Table 2. Relationship Between Depression Level with Lipid Profile

Variabel	**Mild**		**Moderate**		**Severe**		**Total**		**p-Value**
	N	**%**	**n**	**%**	**N**	**%**	**N**	**%**	
TOTAL CHOLESTEROL									
Normal	13	48,2	9	33,3	5	18,5	27	100	0,278
Increase	0	0	2	66,7	1	33,3	3	100	
HDL									
Normal	2	50	2	50	0	0	4	100	0,550
Decrease	11	42,3	9	34,6	6	23,1	26	100	
LDL									
Normal	13	46,4	9	32,1	6	21,5	28	100	0,157
Increase	0	0	2	100	0	0	2	100	

INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

TRIGLISERIDA									
Normal	11	50	9	40,9	2	9,1	22	100	0,046*
Increase	2	25	2	25	4	50	8	100	

* p signifikan <0,05

Discussion

In this study, male respondents was more than female respondents, which 19 (63.3%) male respondents and 11 (36.7%) female respondents. In line with study conducted by Hawamdeh S, et al where found 51% male and 49% female. This may be due to the fact that there are more men with chronic kidney failure than women, according to the results of Riskesdas in 2013[6] where the prevalence of kidney failure in men (0.3%) was higher than women (0.2%). [7]

The level of depression in this study was found most mild depression 13 respondent (43.3%), moderate depression 11 respondent (36.7), and the least severe depression as many as 6 respondent (20%). In line with a study conducted by Hawamdeh S, et al where found 28.3% mild depression, 25.6% moderate depression, and 7.96% severe depression.[8]

There was a significant relationship between depression level and triglyceride levels (p=0.046). This study supports previous studies that found a correlation between depression levels and blood lipid levels. This study inline with a study conducted by Nakao M, et al[9] which found an increase in triglyceride levels in patients suffering from depression. In this study, it was found that respondents who had severe depression tended to have a twofold increase in triglyceride levels compared to respondents who had mild depression and moderate depression. The results of this study contradict the results of study conducted by Morgan et al.[10] who conducted a study of > 1000 respondent and found that respondent with depression tend to have low cholesterol levels. Olusi et al. also reported that patients suffering from depression had lower cholesterol levels than patients who did not suffer from depression.

In this study, there was no significant relationship between depression level and total cholesterol, HDL, and LDL (p > 0.05). Respondents who had mild depression had the same tendency as respondents with moderate and severe depression to have an increase total cholesterol levels, decrease in HDL, and an increase in LDL. This is not in line with study conducted by Rabe-Jablonska et al[11], where they found that depressed patients had lower total and LDL cholesterol levels. They also found that lower total and LDL cholesterol levels could help to determine suicidal tendencies in depressed patients. From another perspective, depression causes increased activity of the sympathetic nervous system and hypothalamic pituitary adrenal (HPA) axis. This causes an increase in stress hormones, namely glucocorticoids (cortisol) and catecholamines (epinephrine and norepinephrine). An increase in the amount of this hormone in the body will interfere lipid regulation, resulting in a lipid metabolism disorder that causes an increase in total cholesterol and an increase in LDL levels.

Patients with severe depression have a tendency to have higher triglyceride levels compared to patients with mild depression and moderate depression, therefore it is necessary to screen for depression in every patient with chronic kidney failure undergoing hemodialysis to reduce risk of cardiovascular complications in these patients. With depression screening, it is hoped that depression will be treated more quickly so that the quality of life of patients with chronic kidney failure undergoing hemodialysis will increase.

The limitation of this study is conducted in single center. The subjects of this study are still few, so it is necessary to do further study with larger subjects. Finally, this study used a cross-sectional design, therefore a causal relationship could not be proven.

References

[1] Mujaddid E.Pemahaman dan penanganan psikosomatik gangguan ansietas dan depresi di bidang ilmu penyakit dalam. In:Sudoyo A,Setiyohadi B,Alwi I,Simadibrata M,Setiati S,editors.Buku ajar ilmu penyakit dalam edisi VI.Jakarta:Interna Publishing;2014:3581-3584.
[2] World Health Organization 2014. A Wealth of information on global public health. 2014.

INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

[3] Danial K, Khurram A, Ahmed K, Ali Zain. Prevalence of Depression among the Patients with End Stage Renal Disease and their Care Givers, and its Associated Factors at a Tertiary Care Hospital in Karachi. Annals of Punjab Medical College. 2016.
[4] Trimarchi M. The Dangers of Low Cholesterol. Diperoleh 13 Juli 2017, dari http://health.howstuffworks.com/diseases-conditions/cardiovascular/cholesterol/dangers-of-low-cholesterol.htm
[5] Thomas JM, Varkey J, Augustine BB. Association between serum cholesterol, brain serotonin, and anxiety: A study in simvastatin administered experimental animals. Int J Nutr Pharmacol Neurol Dis 2014;4:69-73.
[6] Badan penelitian dan pengembangan kesehatan kementrian kesehatan RI tahun 2013. Laporan nasional riset kesehatan dasar (RISKESDAS) 2013. 2014
[7] Biro Komunikasi dan Pelayanan Masyarakat. Cegah dan kendalikan penyakit ginjal dengan cerdik dan patuh. Kementerian Kesehatan Republik Indonesia.2018.
[8] Hawamdeh, Sana et al. "Determinants and prevalence of depression in patients with chronic renal disease, and their caregivers." *International journal of nephrology and renovascular disease* vol. 10 183-189. 3 Jul. 2017.
[9] Nakao M, Yano E. Relationship between major depression and high serum cholesterol in Japanese men.Tohoku J Exp Med 2004:204: 273-87.
[10] Morgan, R.E., Palinkas, L.A., Barret, E. L. Plasma cholesterol and depressive symptoms in oleder men. Lancet. 1993: 75-79.
[11] Rabe-Jablonska J, Poprawska I. Levels of serum total cholesterol and LDL-cholesterol in patients with major depression in acute period and remission. Med Sci Monit.2000:539-47.