RESEARCH ARTICLE

Correlation Between Diabetic Retinopathy, Depression Level and Quality of Life in Eye Clinic Zainoel Abidin Hospital

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Abstract

Diabetic retinopathy (DR) is one of the eye disorders caused by complications of diabetes mellitus (DM). Indonesia has a high prevalence of DR (43.1%) compared to other Asia-Pacific countries. Damage and blockage of blood vessels in the retina causes impaired vision, which may lead to a total vision loss. DR requires special treatment, coupled with regular treatment, that is expensive and may result in depression and poor quality of life. This study aimed to determine the association between the degree of diabetic retinopathy with the level of depression and quality of life in people with DR in the eye clinic of Zainoel Abidin General Hospital Banda Aceh. This cross-sectional study was conducted from April 2018 to January 2019. Data were obtained through funduscopy reading, Hamilton Depression Rating Scale (HDRS) questionnaire, and Short-Form Health Survey (SF-36). The subjects of this study were all diabetic retinopathy patients who were sampled using the accidental sampling method. Based on the Spearman correlation analysis, there was a correlation between degree of DR and depression level (p value of 0.004) and quality of life (p value of 0,037). In conclusion, there is a moderate correlation between the degree of DR with depression level and quality of life among DM patients.

Keywords: Diabetic retinopathy, hamilton depression rating scale (HDRS), level of depression, quality of life

Introduction

Diabetic retinopathy (DR) is one of the leading causes of blindness globally. It is a major complication in diabetes mellitus, leading to disruption and blockage of blood vessels in the retina, which eventually results in loss of vision.[1] Indonesia has a high prevalence of DR (43.1%) compared to other Asia-Pacific countries. This is possibly due to ineffective management of diabetes mellitus.[2] Globally, DR is the fourth most common cause of vision loss after cataracts, glaucoma, and macular degeneration.[1] It has been reported the rates of DR will increase from 126.6 million in 2010 to 191.0 million in 2030, in which roughly 30% suffer from blindness due to vision-threatening diabetic retinopathy.[3] The decrease of visual acuity related to diabetic retinopathy can interfere patient's psychosocial, well-being, and overall function.[4] It can also affect patients' emotional status and quality of life, making them feel pressured, angry, anxious, and lose confidence.[5]

Depression is a global health problem with increasing prevalence every year. Previous research by Roy and Llyoad[6] reported the increased risk of depression among people with diabetes mellitus.In diabetes mellitus, prolonged and expensive therapy can exacerbate the psychological condition of DM patient; therefore, depression symptom is also related to disease duration. Previous studies showed a correlation between duration of the disease and depression in diabetic patients.[7] In addition, there is also a correlation between visual acuity, past treatment, and economic status in DR patients with depression.[8]

The treatment of diabetic retinopathy is

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invasive and requires multiple interventions; thus, affecting patients' quality of life. Quality of life (QoL) is defined by the subjective and dynamic perception of an individual's health and well-being related to a disease.[9] Loss of vision significantly has a negative effect on the physical, psychological, and social well-being of patients with diabetic retinopathy.[9,10,11] This study aims to determine the correlation between the type of diabetic retinopathy with depression level and the quality of life in the eye clinic in RSUDZA Banda Aceh.

Methods

This study was a analytical observational study with a cross-sectional design. The study was conducted from April 2018 until January 2019, after the ethical approval letter number

Table 1 Subjects Characteristics

Characteristics	Frequency (n)
Age (years)	
40–45	2
46–55	18
56–65	18
Gender	
Male	15
Female	23
Occupation status	
Employed	17
Retired	21
Duration of therapy (months)	
1–3	12
4–6	4
7–12	6
>12	16
Monthly Salary	
Below minimum wage payment	31
Above minimum wage payment	7
Visual acuity OD*	
≥6/12	3
≥6/12–<6/12	2
≥6/60 –≥6/18	15
<6/60	18
Visual acuity OS†	
≥6/12	4
≥6/12–<6/12	4
≥6/60–≥6/18	18
<6/60	12

*OD: ocular dextra; †OS: ocular sinistra

065/EA/FK-RSUDZA/2020 was issued by the Health Ethics Research Committee of the Faculty Medicine, Syiah Kuala University. Data was obtained through funduscopy reading by observer and Hamilton Depression Rating Scale (HDRS) questionnaire to verify depression in patients in the eye clinic in RSUDZA Banda Aceh from December 1st 2018 to January 4th 2019. The questionnaire of Short Form Health Survey (SF-36) was also performed to determine the subjects' quality of life.

The population target includes all diabetes mellitus patients with diabetic retinopathy diagnosed by ophthalmologists in eye clinic RSUDZA Banda Aceh. Sampling was done using the accidental sampling method. According to the sample size formula, the minimum sample size needed was 38 samples. The selection was made using inclusion criteria as follows: (1) diabetes mellitus patients in eye clinic, (2) age 40 to 65 years, (3) diagnosed as diabetic retinopathy by ophthalmologists as observer, (4) patients agreed to be included in the study, and (5) able to communicate well. The age of the subjects were categorized to 40–45 years old, 46–55 years old, 55–65 years old; the occupation status of the subjects were categorized as employed and retired. Patients who could not cooperate, patients with other psychiatric disorders, and significant chronic illness will be excluded from this study. The acquired data were presented as characteristic of subject and correlation between the type of diabetic retinopathy and depression level. The hypothesis was tested using Spearman's nonparametric test and was considered significant if (p)<0.05. The statical analyses were done using statistical analysis software SPSS.

Results

Total participants who fulfilled the inclusion criteria were 38 patients. Characteristics of subjects in this study were analyzed based on age, gender, occupation status, treatment period, monthly salary, and visual acuity. The employed subjects work as civil servants, entrepreneur, or teacher. In Aceh, the minimum wage payment is 3 million IDR; therefore, the monthly salary of subjects was categorized as below or above the minimum wage payment. The duration of therapy affects patient's well-being as it requires multiple, repeated intervention. Most of the subjects have undergone diabetic retinopathy therapy for more than three months.

Table 2 Type of Diabetic Retinopathy

Type of Diabetic Retinopathy	Frequency (n)
Mild-moderate non-proliferative diabetic retinopathy (NPDR)	9
Severe-very severe NPDR	17
Proliferative diabetic retinopathy (PDR)	12

Table 3 Depression Level

Depression Level	Frequency (n)
No depression	13
Mild depression	20
Moderate depression	3
Severe depression	2
Very severe depression	0

Characteristics of the subjects were presented in the following Table 1.

Type of diabetic retinopathy in the subjects were determined using fundus photography, demonstrated in Table 2. The table showed that most patients had severe to very severe NPDR at the initial examination (7 of 38), whereas only 9 of 38 patients had mild NPDR.

Depression rates in the subjects were determined using Hamilton Depression Rating Scale (HDRS), presented in Table 3. More than half subjects presented with mild depression. Only small number of the subjects suffered from moderate and severe depression; 3 subjects and 2 subjects, respectively. This study did not detect any case of very severe depression among the subjects.

Correlation between type of diabetic retinopathy and depression level in this study were concluded using Spearman correlation test, presented in Table 4. We found that mild depression was associated with severe to very severe NPDR and PDR. Most patients with mild to moderate NPDR did not exhibit any depression symptoms. This also coincided with the degree of quality of life, where patients with bad quality of life had severe cases of diabetic retinopathy. Correlation between type of diabetic retinopathy

and quality of life in diabetes mellitus patients in this study were concluded using Spearman correlation test, presented in Table 5.

Discussion

The mean age of subjects in this study was 46 to 55 years and 56 to 65 years. This result corresponded with a previous study conducted by Sasongko et al., where the median age of diabetic retinopathy patients was 59 years.[12] As more cells undergo an apoptotic process in older patients, there are a significant decrease in cells and tissue function in the body. Chronic hyperglycemia, inflammation, and oxidative stress can accelerate retina damage. Therefore, the mortality and morbidity rate of patients aged more than 45 years old will also increase.

High estrogen hormone, androgen hormone, and pregnancy are risk factors for DM and DR in females. This study revealed that most subjects were female 23. This result corresponded with a previous study conducted by Kajiwara et al.[13] in Japan, where the development of DR was more profound in female as an independent risk factor. This study also revealed that more than half of the subjects are retired or not working and most subjects earned below the minimum wage payment per month. This result corresponded

Table 4 Correlation between Type of Diabetic Retinopathy and Depression Level

Type of Diabetic Retinopathy	Depression Level					Total	p-value
	No	Mild	Moderate	Severe	Very Severe		
	n	n	n	n	n	n	
Mild-moderate NPDR	7	2	0	0	0	9	
Severe-very severe NPDR	3	13	1	0	0	17	0.04
PDR	3	5	2	2	0	12	

Table 5 Correlation between Type of Diabetic Retinopathy and Quality of Life

Type of Diabetic Retinopathy	Good Quality of Life		Poor Quality of Life		Total		p-value
	n	%	n	%	n	%	
Mild-moderate NPDR	7	77.8	2	22.2	9	100	0.037
Severe-very severe NPDR	5	29.4	12	70.6	17	100	
PDR	4	33.3	8	66.7	12	100	

with a previous study conducted by Xu et al.[8] in China, where most DR patients had low income. This could be related to the occupation of most patients as housewives.The occupation status and monthly salary are related to knowledge and attitude towards diabetic and retinopathy disease. Srinivasan et al.[14] reported that poor attitude and practice of diabetic retinopathy are associated with lower education and socioeconomic status.

This study revealed that patients had moderate (≥6/60-<6/18) to severe (<6/60) visual acuity. This result corresponded with the study by Mulyati et al. in RSU Mochammad Palembang, where most DR patients had moderate to severe visual acuity.[14] There were 17 patients with severe to very severe NPDR and only 9 patients with mild NPDR. This result differed from a study by Zhang et al. in Singapore, where most subjects 51 had mild NPDR.[15] This result might be affected by the duration of diabetes and chronic hyperglycemia. In this study, there were 20 DR patients with mild depression. This result was suitable with a study by Xu in China, where some DR patients had depression.[8]

Limited visual function and daily activity associated with diabetic retinopathy would eventually lead to depression. Macula oedema and ischemia, caused by damage to the blood-retinal barrier and leakage of plasma fluid in the retina, could precipitate a loss of vision in DR. The prevalence of macula oedema in diabetic patients was 10% and increased in severe diabetic retinopathy. From this study, it was obtained two patients with mild DR and five patients with severe DR or PDR had mild depression. Out of four patients with severe or PDR, two had moderate depression and two had severe depression. The result of this study was suitable with a previous study by Gyneth et al., which stated a correlation between NPDR or PDR and depression.[5] Previous studies reported that vision loss in DR had social and emotional

impairment, which affected patients' mental health.[16,17] Several psychosocial factors are affecting a person's mental health, including lack of social function, loss of autonomy, lack of family support, and a high environmental stressor. Back Theory stated that cognitive process also plays an essential role in emotional impairment, such as negative thought that patients are not able to function well and have to rely on someone else.[17]

This study revealed that most subjects had less than one million salaries per month and worked as housewives. The low socioeconomic status could further aggravate depression. As the long duration of DR therapy was needed to prevent disease progression and preserve visual function, most subjects in this study underwent treatment for more than a year. However, the treatment of DR also affecting the patients' psychological condition due to the additional transportation cost to travel to the district hospital.

The degree of diabetic retinopathy was closely related to visual function, hence directly affecting the patients' quality of life. Trento et al. confirmed that patients with loss of vision experienced trouble in performing daily activities.[18] Several debilitating effects related to vision loss in DR, including loss of independence, greatly affected patients' quality of life.[19] This study found that 70.6% of patients with severe to very severe NPDR and 66.7% of patients with PDR had a poor quality of life, while only 22.8% of patients with mild to moderate NPDR had a bad quality of life. It can be concluded that as the disease progresses, it can negatively affect patients' quality of life. This result corresponded with a study by Alcubierre et al., which found that patients with more severe DR had significantly worse quality of life.[11]

This study has several limitations. Depression is a multifactorial disease which greatly affected by various internal or external condition. Although it is covered fully by the national health

insurance, currently there is only one hospital in Aceh Province that offers diabetic retinopathy treatment. Consequently, this study may need to take into account the data of patients' residence and the distance from Zainoel Abidin Hospital. The HDRS and SF-36 questionnaires also may not reflect the entire mental condition of the diabetic patients during their course of disease. Based on this study, p-value obtained was 0.004 and 0.037 (p<0.05) with moderate correlation. To conclude, there was a moderate correlation between the type of diabetic retinopathy with depression level and quality of life in DM patients in eye clinic in RSUD dr. Zainoel Abidin Banda Aceh.

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