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Case Report

Effect of Depression in The Elderly on Glaucoma and Pharmacotherapy Options

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Abstracts

Introduction: Depression in the elderly is often not detected because elderly people who are depressed show more somatic or cognitive complaints than affective complaints. The relationship between depression and the progression of glaucoma has been studied and taken into consideration in the selection of therapy to be given. **Methods**: This report is a case report from a patient who has been given an explanation and received consent regarding a psychiatric interview, physical examination and support, interventions, case discussion presentations, and the confidentiality of all patient personal information. **Case**: Education was carried out on a 72-year-old patient with a Major Depressive Episode without psychotic symptoms who also had glaucoma a few months after complaining of depression. The education provided includes knowledge about depression and its relationship to glaucoma, a management plan in the form of advice for hospitalization in a hospital that has a psychiatrist and an ophthalmologist. **Conclusion:** Depression in the elderly can affect the progression of glaucoma. The choice of psychopharmacological therapy needs to be adjusted by considering its side effects on the possibility of glaucoma or the risk of aggravating the progression of glaucoma.

Keywords: Depression, Elderly, Glaucoma, Pharmacotherapy Options, Health Risk

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INTRODUCTION

Depression is a psychiatric disorder characterized by at least five symptoms of decreased mood, loss of interest, decreased or increased weight or appetite, sleep disturbances, psychomotor agitation or retardation, fatigue, feelings of guilt or low self-esteem, decreased concentration, and recurrent thoughts about death, lasting most of the day for at least the same two weeks. The obligatory symptom is decreased mood or loss of interest [1]. The Diagnostic and Statistical Manual of Mental Disorders 5 (DSM 5) does not mention a specific diagnosis for depression in the elderly, so that the criteria for depressive episodes or recurrent depressive disorders can be used in this condition [2]. Depression in the elderly can be expressed as a depressive disorder that occurs in patients over 60 years of age [2, 3].

Depression has a reciprocal relationship with chronic disease. Both of them influence each other [4]. The higher the value of depressive symptoms associated with the higher the risk of experiencing chronic disease [5]. One of the chronic diseases is glaucoma [6].

Glaucoma is a neurodegenerative syndrome that results from retinal ganglion cell death and is characterized by progressive optic atrophy [7]. Glaucoma causes progressive loss of vision and is a major cause of irreversible blindness worldwide [6, 8].

There are studies that describe the effect of depression on the progression of glaucoma [9, 10] and the selection of appropriate psychopharmacological therapy for this condition [11].

METHODS

This report is a case report from a patient who has been given an explanation and received consent regarding a psychiatric interview, physical examination and support, interventions, case discussion presentations, and the confidentiality of all patient personal information.

CASE

A javanese female patient, 72 years old, thin stature and shabby-looking. She is a divorcee and housewife, has 5 children and lives with the family of her third child.

She came to the geriatric polyclinic at Dr. Radjiman Wediodiningrat Mental Hospital accompanied by her third child because she complained of a loss of interest. What is meant by loss of interest is that she no longer feels the desire or pleasure to carry out daily activities. She could perform daily activities with light assistance. That complaint was felt since 8 months before the examination. This started after living with the family of her second child. She felt unsuited to the behavior of his daughter-in-law who often takes the patient's belongings without the patient's permission. She harbored this problem because he did not want to make a fuss. She only told his third child who was close to her, but his third child also did not want to confirm this. According to his son's statement, she was also thinking about leaving for the Umrah pilgrimage which is still uncertain.

In addition to complaint of loss of interest, she also complain of frequent confusion. What is meant is that she doesn't know why they often suddenly feel pain all over their body and don't know what to do to reduce it. She often repeat talking about her pain complaint. Her appetite is reduced and her sleep feels restless.

Then she went to a psychiatrist who had treated her in 2007. She got therapy, namely Fluoxetine, Clobazam, Concoction Capsules, Antacids and Lansoprazole. She did not take the medicine because she remembered having felt pain all over her body after taking the medicine before.

She went to an ophthalmologist 2 months before the examination because she complained that her right eye was more blurred than her left. This complaint is felt to be burdensome when she thinks about the psychological problem. She was told that she had glaucoma. She was hospitalized for improvement of her eye condition. Currently, she is undergoing outpatient treatment by receiving eye drops but it is not used regularly

because she feels not getting any improvement.

She had just taken medicine from a psychiatrist after suffering from glaucoma but complained that her eyes were getting worse, especially when taking concoction drugs. When her eye hurts, her whole body becomes sore and her stomach becomes hard. This makes her increasingly feel confused and sometimes think it would be better to just die.

She became afraid and asked for frequent company because she was afraid that as she got older she would lose her sight. Currently, she lives with the family of her third child. Daily activities such as self-care can still be done independently, although sometimes light assistance is needed. There was no complaint of forgetfulness in her.

She had been hospitalized at Lawang Mental Hospital in 2007 for about 1 month because she felt sad and often cried due to crop failure. After being treated, she never went for control because he felt that she had improved and could return to her normal activities. There was no family history of mental illness or glaucoma.

The MADRS (Montgomerry-Asberg Depression Rating Scale) psychometric examination yielded a result of 43 (indicating major depression). The Barthel index results show a value of 15 (mild dependence). The Mini-Mental State Examination (MMSE) cannot be carried out considering her current condition.

Based on information from her son before her illness, she is a person who easily thinks of problems but always keeps them to herself. She tends to avoid conflict with others.

We diagnosed the patient as major depressive disorder, single episode, severe without psychotic features (F32.2). We provide psychoeducation to that patient and her son who accompany her. Psychoeducation that we provide about depression and the treatment plan that will be given. Consultation Liaison Psychiatry (CLP) cannot be performed in an outpatient setting due to the absence of an ophthalmologist at Lawang Hospital. The patient were advised to undergo hospitalization at a hospital that has a psychiatrist and ophthalmologist so that they can monitor the development of her mental condition and eyes in an integrated manner. The patient and her son consider going outpatient first while being under control at the ophthalmologist. She received a prescription for 25 mg of quetiapine orally every night and 12.5 mg of quetiapine orally if she feels confused in the morning or afternoon.

DISCUSSION

Depression in the Elderly

Depression in the elderly is often not detected because elderly people who are depressed may not convey affective complaints or a decrease in the mood they feel but rather show somatic complaints or cognitive complaints. Depression in the elderly has been shown to be associated with negative consequences, namely poor quality of life, difficulty with activities of daily living, comorbid physical illness, early death and cognitive impairment [12].

Globally, the prevalence of depression in the elderly reaches 13.3%. The prevalence in women is higher than in men, namely 11.9% compared to 9.7% [13]. In Indonesia, the 2018 National Basic Health Research Report mentions depression in the age group 65-74 years and 75 years and over at 8.0% and 8.9% respectively [14].

Glaucoma in the Elderly

The incidence of glaucoma increases with age [15]. The global prevalence of glaucoma is estimated to be 3.5% of the population aged 40-80 years [8] and is expected to reach nearly 112 million people in 2040 [6], [8]. The disease usually has poor visual and functional consequences at diagnosis because it is often asymptomatic until it is advanced. Glaucoma-related vision loss negatively affects quality of life and activities of daily living in the elderly [15].

Glaucoma Risk Factors

Glaucoma is a multifactorial disease with various risk factors that have been reported.

The main risk factors for this disease are intraocular pressure (IOP) and age. Other risk factors include race, gender, family history of glaucoma, myopia, central thin cornea, corneal hysteresis, low ocular blood flow, lamina cribrosa disorders, oxidative stress, neuroinflammation, and lifestyle factors [16, 17]. Risk factors for glaucoma progression are grouped into mechanical and vascular categories. The mechanical category includes increased IOP and large IOP fluctuations. The vascular category includes the presence of optic disc hemorrhage and blood pressure [9].

Effects of Depression on Glaucoma

The underlying mechanisms between depression and the development of glaucoma are unclear, but the two share some pathophysiological similarities that may explain the association. Neuroinflammation plays a role in both diseases. Neuroinflammation and microglial activation have been found in the brains of patients with depression and the optic nerve heads of patients with glaucoma. Inflammatory cytokines such as c-reactive protein, interleukin 6, and tumor necrosis factor (TNF) have also been reported to be increased in both [18].

Neuroplasticity in depression mediated by proteins such as BDNF is impaired. Reduced BDNF levels in depression may affect retinal ganglion cell survival in the development of glaucoma [18].

Depression is associated with unhealthy lifestyle behaviors including smoking and physical inactivity. Patients with depression have been found to have an increased risk of obesity, which may be due to genetic factors, changes in homeostatic adjustments such as the hypothalamic-pituitary-adrenal axis or immune response, and antidepressants. These lifestyle behaviors and obesity have been associated with increased intraocular pressure or an increased risk of glaucoma [18].

Depression is a reaction to stress. The amygdala plays a role in processing emotions when individuals experience stressful events. This emotional response evokes the secretion of neurotransmitters and stimulates the autonomic nervous system which affects many organs. Continuous emotional responses can damage the balance of the autonomic nervous system which plays a role in biological balance in the body, including regulating IOP and ocular blood flow. IOP is the most important modifiable factor in the development of glaucoma. Decreased ocular blood flow is also associated with the development of glaucoma. Autonomic nervous system dysfunction can interfere with this function. Emotional stress such as depression affects IOP variations and disrupts blood flow through an unstable autonomic nervous system [9].

The impact of depression on the progression of glaucoma is also influenced by decreased adherence to medication in individuals who are depressed. This makes the disease outcome worse [10].

Antidepressants and Glaucoma Risk

Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonine and Noradrenaline Reuptake Inhibitors (SNRIs) are first-line therapies for the treatment of depression [11, 19]. Both have the same mechanism of action, namely inhibiting the reuptake of serotonin from the synaptic cleft. Serotonin receptors 5HT1A, 5HT2A, 5HT2C, and 5HT7 are known to be located in the iris-ciliary body complex in ocular structures. Stimulation of 5HT1A receptors causes a reduction in aqueous humor thereby reducing IOP. Stimulation of 5HT2A, 5HT2C, 5HT7 receptors increases the production of aqueous humor, causing IOP to increase [11]. One of the side effects of SSRIs in the eye is an increase in IOP [19].

Another SNRI mechanism of action is to inhibit the reuptake of noradrenaline from the synaptic cleft. This can lead to an increase in IOP via α2 receptor blockade which reduces aqueous humor outflow [11].

Bupropion belongs to the noradrenaline and dopamine reuptake inhibitor (NDRI) class of drugs and is known to have anti-tumor

necrosis factor (TNF) effects [11, 19]. It is hypothesized that IOP may be raised by TNF through increased caspase activity or mitochondrial dysfunction in the aqueous humor outflow tract. TNF synthesis is decreased by activation of noradrenaline (β2 receptors) and dopamine (D1 receptors). This allows bupropion to have protective properties regarding IOP and glaucoma [11].

Tricyclic Antidepressant (TCA) causes mydriasis and cycloplegia due to its anticholinergic effect. This creates a blockage in the trabecular meshwork and results in glaucoma [11].

Atypical antipsychotics can function as antidepressants alone or in combination with other antidepressants [20]. Administration of antipical antipsychotics is generally not associated with glaucoma risk [11].

CONCLUSION

Depression in the elderly can affect the incidence and progression of glaucoma. The choice of psychopharmacological therapy needs to be adjusted by considering its side effects on the possibility of glaucoma or the risk of aggravating the progression of glaucoma.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest in the writing and publication of this case report.

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