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Characteristics and Clinical Presentation of Optic Neuropathy Patients with HIV in Eye Polyclinic of Sanglah General Hospital Denpasar from January 2019 – December 2020

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ABSTRACT

Purpose: Human Immunodeficiency Virus (HIV) is a virus that attacks the immune system, complemented by clinical, immunological, and virological disorders. Ocular manifestations were reported in 54% of patients with HIV in Indonesia, with manifestations of posterior segment abnormalities in HIV. This study aims to determine the characteristics and clinical features of optic neuropathy patients with HIV in the Eye Polyclinic of Sanglah General Hospital Denpasar.

Methods: This is a case series study within an observational cross-sectional approach. Data were collected retrospectively by recording the characteristics and clinical features of optic neuropathy in HIV patients at the Eye Polyclinic Sanglah General Hospital Denpasar based on medical records from January 2019 to December 2020. The subjects in this study were 16 people. Characteristics male gender dominates optic neuropathy patients with HIV with 13 patients (81.25%), range of 20-40 years (68.75%).

Results: Decreased visual acuity is the most clinical presentation found in optic neuropathy patients with HIV in this study with 16 patients (100%), with edema papil in 10 patients (62.5%), atrophy in 6 patients (37.5%). Positive CMV laboratory test results were found in 15 patients (93.75%), the duration of HIV diagnosis to the diagnosis of optic neuropathy was mostly seen with range time six months to 1 year as many as ten patients (62.5%), with CD4 cell counts <100 cell/mL in 12 patients (75%).

Conclusions: A multidisciplinary approach is needed to diagnose optic neuropathy with HIV to get the proper management, which will affect the patient's quality of life.

Keywords: Human Immunodeficiency Virus (HIV), optic neuropathy, CD4

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INTRODUCTION

Human Immunodeficiency Virus (HIV) is a retrovirus that causes Acquired Immune Deficiency Syndrome (AIDS). Since its discovery, HIV/AIDS has emerged as a global health problem. Worldwide, 35 million people living with HIV, and 19 million people do not know their HIV positive status, with a worldwide prevalence of 0.8%. Based on data from the Directorate General of Disease Prevention and Management (DG P2P) in 2017, there were 2,441 HIV patients in Bali, and 736 people with AIDS.^{1,2}

Ophthalmic manifestations were reported in 54% of patients with HIV in Indonesia, with expressions of posterior

segment abnormalities in HIV quite common. They can cause vision loss, namely retinal microangiopathy, CMV retinitis (cytomegalovirus) (30-40%), VZV retinitis (Varicella zoster), toxoplasma retinochoroiditis, syphilis chorioretinitis, optic neuropathy, and atrophy, decreased contrast sensitivity, abnormal color vision, retinal detachment.³⁻⁵ In general, T-CD4 + lymphocyte counts have been used to predict the onset of certain common conditions and eye infections in HIV positive patients. A CD4 + T cell count below 500 cells / μ L was associated with Kaposi's sarcoma, lymphoma, and tuberculosis (TB). CD4 + T cell counts below 250 cells / μ L were associated with pneumocystosis and toxoplasmosis.

A CD4 + T cell count of fewer than 100 cells / μ L was associated with the following: Retinal or conjunctival microvasculopathy, optic disc swelling, optic atrophy, CMV retinitis, VZV retinitis, Mycobacterium avium complex infection, Cryptococcosis, Microsporidiosis, HIV encephalopathy, progressive multifocal leukoencephalopathy. Unlike other eye diseases, eye infections in these immunosuppressed patients have minimal inflammation signs.^{6,7}

HIV patients experience blindness ranging from 6.9 - 23% of all HIV patients, so it is highly recommended that HIV patients be referred to an ophthalmologist for screening so that there are no treatment delays. Because often, patients who come

to eye polyclinics with HIV are already in the condition of optic neuropathy. Therefore, the researchers wanted to present a description and demographic characteristics of optic neuropathy patients in HIV patients at Sanglah Hospital eye clinic in January 2019 - December 2020.

METHOD

This study is a case series study with a cross-sectional study approach (cross-sectional) observational. Data were collected retrospectively by recording the characteristics and clinical features of optic neuropathy in HIV patients with consecutive sampling technique at the RSUP Sanglah Denpasar Eye Polyclinic based on medical records from January 2019 to December 2020. Research data included gender, age, domicile, ethnicity, occupation, main complaints, visual acuity, contrast sensitivity, visual field, color vision, duration of HIV to optic neuropathy, the period of use of Anti Retroviral Therapy (ART), laboratory results.

Data analysis was performed using descriptive statistics on the variables studied. Characteristics were analyzed univariately with categorical variables presented in the form of proportions and numerical variables presented in the form of mean if the distribution was normal and median (minimum-maximum) if the distribution was not normal. The description of optic neuropathy patients with HIV is presented on a case by case basis.

RESULT

In this study, 16 subjects with inclusion and exclusion criteria, 13 patients (81.25%) were male, compared to 3 (18.75%) women. Based on age, the most age was found in the age range of 20-40 years 11 (68.75%), > 40 years 4 (25%), and <20 years 1 (6.25%). The domicile of the subjects mostly came from Denpasar 6 (37.5%), followed by Badung as 5 (31.25%), Gianyar 3 (18.75%), Singaraja, and outside Bali (West Nusa Tenggara) 1 (6.25%). The ethnic groups of the research subjects mostly came from Bali 12 (75%), Java 3 (18.75%), West Nusa Tenggara 1 (6.25%). The occupations of the research

subjects were dominated by entrepreneurs 11 (68.75%), three housewives (18.75%), a driver, and a student each (6.25%).

Optic neuropathy patients' main complaint with HIV was a blurred vision in 16 people (100%). A decrease in initial visual acuity in optic neuropathy patients obtained a visual acuity of $\leq 3/60$ 13 (81.25%), another clinical finding was that the RAPD examination was positive in 8 (50%), the condition of the optic nerve papules found edema in 10 (62.5%) and atrophy 6 (37.5%).

The group receiving HAART therapy for less than 1 year was almost two times larger than the group receiving HAART therapy for more than 1 year. Duration of ART consumption 6 months - 1 year were 9 (56.25%), > 1 year were 5 (31.25%), <6 months were 2 (12.5%).

Duration of HIV diagnosis until optic neuropathy was found at most after 6 months - 1 year 10 (62.5%), after > 1 year 4 people (25%), after <6 months 2 people (12.5%). This study found that the number of CD4 levels <100 cells / μL was found in 12 people (75%).

DISCUSSION

Human Immunodeficiency Virus (HIV) is a retrovirus that causes Acquired Immune Deficiency Syndrome (AIDS). Since its discovery in 1981, HIV / AIDS has emerged as a global health problem.¹ Worldwide, 35 million people living with HIV, and 19 million people do not know their HIV positive status, with a global prevalence of 0.8%.² One of the complications that this disease can cause can occur in the eye. Blindness can also be a problem that disrupts someone's life with HIV.⁸ This study was conducted to determine the characteristics and clinical picture of optic neuropathy patients with HIV in the RSUP Sanglah Denpasar eye clinic for January 2019 - December 2020. In this study, 16 research subjects met the inclusion and exclusion criteria, where the majority of patients were male. 13 people (81.25%), compared to 3 women (18.75%). Based on age, in the age range of 20-40 years 11 (68.75%), > 40 years 4 (25%), and <20 years 1 (6.25%). This study is in line with research conducted by Odoom in Ghana, where it was found that the age range of 31-45 years was found with the

most eye abnormalities in HIV patients.⁸

The domicile of research subjects mostly came from Denpasar 6 (37.5%), followed by Badung 5 (31.25%), Gianyar 3 (18.75%), Singaraja, and outside Bali (West Nusa Tenggara) 1 (6.25%). The ethnic groups of the research subjects mostly came from Bali 12 (75%), Java 3 (18.75%), West Nusa Tenggara 1 (6.25%). The occupations of the research subjects were dominated by entrepreneurs 11 (68.75%), 3 housewives (18.75%), a driver, and a student each (6.25%).

Optic neuropathy patients' main complaint with HIV was a blurred vision in 16 people (100%). A decrease in initial visual acuity in optic neuropathy patients obtained a visual acuity of $\leq 3/60$ 13 (81.25%), another clinical finding was that the RAPD examination was positive in 8 people (50%), the condition of the optic nerve papules found edema in 10 people (62.5%) and atrophy as many as 6 people (37.5%). This study is in line with the research of Demirkaya, et al. patients with CD4 <100 cells / μL more found a significant reduction in the mean thickness of the optic nerve, then enter the initial phase where there is swelling of the optic nerve papules because the axons are disrupted by mitochondrial toxicity mediated by HIV / ART, which eventually leads to nerve atrophy optics.⁹ The pathophysiology of optic neuropathy with HIV is still unclear. Cases of optic neuropathy with HIV without any visual impairment or visual field defects without retinitis showed degeneration of the optic nerve's axons by macrophages. Other studies also exist that state the inflammation mechanism, which negatively affects visual acuity after being given anti-retroviral therapy. Some patients also show good visual acuity changes after being given intravenous steroids. Optic neuropathy has a broad differential diagnosis, such as ischemia, infection, inflammation, or compression / infiltrative lesions, trauma, glaucoma.¹⁰⁻¹²

Optic neuropathy cases with HIV are still rare, more frequent cases with HIV retinopathy and complications associated with opportunistic infections such as CMV retinitis. Optic neuropathy is usually associated with damage to the optic nerve, visual field loss, dyschromatopsia, and RAPD if the neuropathy is unilateral.

Research by Shah KH, et al. indicates CMV is a major risk factor in patients with HIV. Changes in contrast sensitivity, color vision, and visual field can be seen in HIV patients. (Shah KH, et al., 2006) Freeman, et al. showed 12% of patients with HIV showed decreased contrast sensitivity and color vision, and visual fields.¹⁰

This study is in line with the previous studies that 50% of confrontation examinations were difficult to evaluate due to severe visual impairment. Contrast sensitivity examination, FD15, Ishihara also found that 50-81.25% could not be assessed due to a severe visual acuity decrease.

Kumarasamy, et al., the use of ART reduced the incidence of eye complaints.¹³ Research Odoom, et al. showed that patients who have received ART have a lower risk of developing ocular manifestations than patients who have not received ART.⁸ The study of Amsalu, et al. showed that patients who received HAART therapy for less than 5 years were 2.5 times more likely to develop ocular manifestations than the opposite group. This is because long-term use of HAART reduces plasma HIV RNA to low levels permanently, decreases viral load, increases CD4 cell count, and increases the patient's immune status, which can reduce the incidence of opportunistic infections.¹⁴ These findings are consistent with this study in which the group receiving HAART therapy for less than 1 year was almost twice as large as the group receiving HAART therapy for more than 1 year. This study is following previous studies where the duration of ART consumption for 6 months - 1 year was 9 people (56.25%), > 1 year as many as 5 people (31.25%), < 6 months as many as 2 people (12.5%).

Amsalu's research, et al. showed that ocular manifestations were more common in patients with HIV infection who had been diagnosed for less than 12 months, namely 86.6% compared to those without ocular manifestations. Compared with a diagnosed duration of more than 12 months, the group diagnosed with < 12 months tended to have a higher prevalence (Amsalu et al, 2017). This is in line with this study where the duration of

HIV diagnosis until optic neuropathy was found at most after 6 months - 1 year 10 (62.5%), after > 1 year 4 people (25%), after < 6 months 2 people (12.5%).

This study found the number of CD4 levels < 100 cells / μ L was found in 12 people (75%), this is in line with the research of Freeman, et al. where the number of CD4 levels < 100 cells / μ L is known to increase the risk of the incidence of ocular manifestations by 31.5%. This study contradicts a study in Chiang in 2018 where patients with CD4 > 200 cells / μ L experienced more ocular manifestations of HIV (22.4%) than CD4 < 200 cells / μ L and also research conducted by Labh, et al. where patients with CD4 > 200 cells / μ L had more ocular manifestations of HIV (57.5%) and this study. This study got more presentations because patients with HIV infection only carry out eye examinations if it has interfered with their daily activities.¹¹

CONCLUSION

The incidence of optic neuropathy with HIV patients who came to the RSUP Sanglah eye clinic for January 2019 - December 2020 was 16 cases. The majority were men, middle age with the most clinical picture of very severe visual impairment with optic nerve edema conditions. with a majority CD4 cell count < 100 cells / μ L, CMV was the major risk factor in this study identified in the majority of patients. The duration of patients who have HIV until they were diagnosed with optic neuropathy was mostly found at 6 months - 1 year after being diagnosed with HIV and had been taking ARV for 6 months - 1 year.

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