Case Report: A Rare Case of Glioblastoma in Patient with HIV-AIDS

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Abstract

Patients with HIV_AIDS have an increased risk to develop neurological disorders include a complication of intracerebral mass. Primary CNS tumors in this condition are rare and difficult to diagnose because it has uncommon presentation, unusual tumor growth and manifests at a young age in a patient with HIV-AIDS. Advanced imaging techniques with contrast-enhanced magnetic resonance scans should be used to guide diagnosis in this condition. in a patient with HIV-AIDS, biopsy should be carried out if standard imaging showed atypical features or in a patient who has a poor response to empirical treatment for neurotoxoplasmosis. In this case, we reported a case of A 26 years old male with HIV-AIDS with neurological deficits who later diagnosed with glioblastoma.

Keywords: *HIV-AIDS, Glioblastoma, Glioma*.

Introduction

Patients with HIV-AIDS are at risk to develop either infectious or non-infectious complications. Neurological disorder occurred in up to 60% of patients with AIDS and 10% of patients have an intracerebral mass as a complication of its condition.

Glial central nervous system (CNS) malignancy found in 0.05 percent of all CNS tumors, and although this tumor recognized as the most common primary CNS tumors, it is very uncommon to found in the patient with HIV-AIDS and very difficult to diagnosed because they present with uncommon features of tumor localization and unusual tumor growth as well as presenting at a younger age in a patient with HIV-AIDS. Incidence of glioblastoma in HIV-AIDS patients increasing mortality risk that already substantially high in those populations. (1, 2)

This case report discussing a rare case of new diagnosed young HIV-AIDS patient with a glioblastoma who has neurologic deficit as initial manifestation.

Case Description

A 26 years old male was admitted to the emergency department of RS Dr. Soetomo, Surabaya, Indonesia because of loss of consciousness 2 days before admitted to the hospital. Heteroanamnesis from other family members revealed that initial symptoms developed fluctuating. This complaint is accompanied by limb weakness but no complaint of facial palsy. History of projectile vomit was denied but there was a history of prolonging headache and febrile. In the last 1 month, the patient frequently complained of fever that gone with over-the-counter medicine but denied any history of recurrent oral ulcer, profuse diarrhea, weight loss, or history of swollen skin or tumor. There was no history of hypertension or diabetes mellitus.

In the last two days, the patient started to feel shortness of breath with an occasional cough. There was no history of head trauma. The patient was admitted to the emergency department and then tested positive for HIV/AIDS. Head imaging showed a brain tumor and the patient was offered to undergo a surgical removal but the family denied any surgical approach. The patient

worked as a metal worker and is currently not married with limited social interaction. The family didn't know about a history of sexual activity but denied a history of alcoholism or drug abuse.

From the physical examination, the patient was somnolence with Glasgow Coma scale E2 V3 M4, the vital sign was blood pressure 11/70 mmHg, heart rate 96 beats per minute, respiratory rate 24-26 times per minute, body temperature was 37.2o. On head examination, the patient was dyspneic but was not anemic, not icteric, oral thrust and there was no lymphadenopathy. Chest examination was symmetric, with normal heart sound and crackle on pulmonary examination. Abdomen examination within normal limit without liver or spleen enlargement. There was no edema on extremity.

Laboratory examination was Hb 11,3 g/dl, HCT 32.1 %, MCV 81,5 fL, MCH 28,7 pg, MCHC 35,2 g/dl, leukosit 7600 /mm^3, neutrophil 85,3 %, limphocyte 6,2 % mmol/l platelet 229.000/mm^3, serum creatinin 0.43 mg/dl, BUN 13.0 mg/dl SGOT 57 U/l, SGPT 63 U/L, serum albumin 3,8 g/dL, Sodium 128 mmol/l , Potassium 3.8 mmol/l, Chloride 91 mmol/l , PPT 14,2 seconds dan APTT 28.8 seconds with non reactive HbsAg and anti-HCV. Blood gas analysis results was pH 7.45, pCO2 33 mmHg, pO2 131 mmHg, TCO2 23.9 mmol/L, base excess -1.1 mmol/L, HCO3 22.9 mmol/L, and SO2 99%. 3 methods HIV test was 3 positives and CD4 was 5 cells/ μL (1.05%).

Chest radiography showed a diffuse pulmonary infiltration and normal cardiac imaging Head CT imaging with contrast showed a rim enhancing solid lesion 2.5x2.5.3.2 cm in internal capsule with an irregular inner wall and perifocal edema caused by narrowing down of right lateral ventricle dan midline shift to the left up to 1.9 cm suggesting a primary brain tumor (Glioblastoma). Later, evaluation with contrast-enhanced MRI of the head showed peripheral enhancing intra-axial, supratentorial lesion with hemorrhaging part and a necrotic area within internal capsule suggesting a glioblastoma.

The patient was assessed as HIV-AIDS, glioblastoma multiforme, suspected Pneumocystis Carinii Pneumonia, oral candidiasis, and mild hyponatremia. Patient treated with liquid diet 200 ml every 4 hours, IVFD NaCl 0.9% 1500 ml every 24 hours, 02 on a nonrebreathing mask 10 liters per minute, Ceftriaxone intravenously 1000 mg every 12 hours, Dexamethasone intravenous 5 mg every 6 hours tapered down based on clinical improvement, cotrimoxazole 960 mg every 12 hours, paracetamol tablet 500 mg every 6 hours and nystatin 2 drips every 12 hours. Laboratory examination planning was blood gas analysis evaluation, electrolyte serum, LDH serum, and smear sputum gram and culture and sensitivity of sputum. The patient denied to surgical approach for the tumor. 2 days after admission, the patient died in the hospital because of respiratory failure.

Discussion

HIV infection/AIDS is a global pandemic, with cases reported from virtually every country. It is estimated that 95% of people living with HIV/AIDS live in low- and middle-income countries; 50% are female, and 3.2 million are children aged under15 years.[3]

Concerning HIV and malignancy, A study showed that HIV patients had a 5.4-fold higher incidence of malignancy compared to the general population. Even after removing the incidence of Hodgkin's disease in the population with HIV-AIDS, there was still a 3.4-fold increase in the risk of malignancy. This includes an elevated risk of brain tumors, though not all of these were confirmed histologically.[4] Between 1986 and 1998, the population of patients with HIV-AIDS seen at Memorial Sloan-Kettering Cancer Center had a 45-fold higher risk to develop glioblastoma than normal patient.[5]

Glioma is a broad term used for primary brain tumors that are categorized based on their suspected cell of origin, for example, astrocytic tumors, ependymomas, oligodendrogliomas, and mixed gliomas. Account for almost 80% of all malignant primary tumors, it becomes the most common tumors of the central nervous system with glioblastoma multiforme as the most malignant and most frequent type of primary astrocytoma. Glioblastoma

was called glioblastoma multiforme because it varies in size and shape, but that term has not used nowadays. This type of tumors has a feature as highly invasive and infiltrating in brain parenchyma but typically limited in the central nervous system.[6, 7]

Some studies to link this disease to particular environmental and occupational exposures still inconclusive and underpowered. Ionizing radiation is one of the few recognized risk factors for glioma progression that has been proven. Ionizing radiation is one of the few recognized risk factors as seen years after radiation indicated for therapeutic for another tumor or condition.[8] Some specific genetic diseases are suspected to increase the risk of glioma development such as neurofibromatosis, tuberous sclerosis, Li-Fraumeni syndrome, and Turcot syndrome, but Glioma patients with a proven genetic disease account for fewer than 1% in all cases.[9] Glioblastoma has not been confirmed to be caused by other environmental factors such as smoking, synthetic rubber, electromagnetic field, or nonionizing radiation from cell phones.[10]

Gliomas develop from the malignant transformation of neuroectodermal-derived supporting cells and are presumed to link with mutation of tumor suppressor gene.[11] The immunocompromised condition of the patient with HIV/AIDS may facilitate the development of neoplasms, as seen in primary cerebral lymphoma and Kaposi sarcoma.[12] Evidence of interplay between immune system and pathogenesis of glioma in large epidemiological studies showed that patients with a history of the allergic disease have a lower risk for developing glioma, suggesting that a stronger immune system could be linked to a more effective intracranial response against certain neoplasm. Otherwise, immunosuppression caused by immunosuppressive drug therapy has been closely linked to a rise in the incidence of intracranial gliomas in organ transplant recipients.[1]

Some of the hypotheses associated with an increased risk of patients with HIV-AIDS for to develop brain tumor were associated with HIV gene regulators such as *nef* that alter astrocyte growth and morphology similar to neoplastic transformation in vitro studies. Besides, HIV infection also induces the secretion of proinflammatory cytokines such as IL-1, Il-6, IL-8, and TNF alpha which can facilitate the development of glioblastoma.[1, 13]

Initial symptoms of a patient with glioblastoma may vary depending on the size, location, and anatomic structure involved in the brain. The majority of typical symptoms are caused by increased intracranial pressure, such as headache and focal or progressive neurologic deficits. [14, 15] Three mechanisms that account for glioblastoma signs and symptoms are the direct effect of the tumors that resulted from damage in brain tissue, by secondary effect of increased intracranial pressure, and symptoms related to specific tumor location.[6] Concerning HIV-AIDS, a case report by Hall and Short showed most patients with HIV /AIDS who developed Glioblastoma were young (mean age is 38 years) with a CD4 count mean 400 cells/mm.[16]

Glioblastoma in a patient with HIV-AIDS is difficult to diagnose because of its uncommon features of tumor localization, unusual tumor growth, and presence at a younger age in a patient with HIV-AIDS. [2] referred non-invasive imaging techniques for brain tumors are MRI scans to visualizing the tumors. MR scans are the gold standard imaging because of their superior soft-tissue contrast to better visualization of complexity and heterogeneity of tumor lesion. CT scans are often recommended where a patient cannot perform an MR scan for several reasons, such as patients with pacemakers. T1–weighted MR scans can visualize hypointense lesions whereas proton density-weighted and T2-weighted images visualize hyperintense lesions. Gadolinium-enhanced MR scan of patients with glioblastoma typically shows a central area of necrosis, surrounded by white matter edema. Tumors are usually unifocal but can be multifocal. Latest imaging techniques with MR can also help to detect the hemodynamic changes, lesion architecture, and even cellular metabolism of tumors. This technique can be used to differentiate between active tumor or treatment effect on tumor itself. [7, 17]

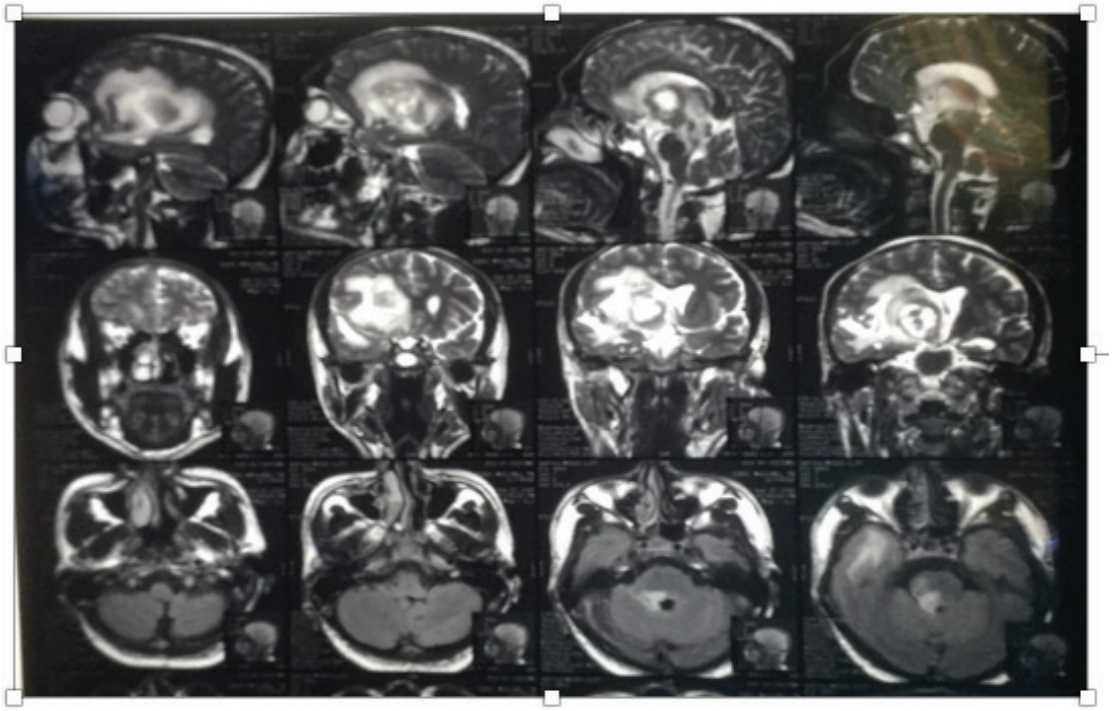

Figure 1. Patients head MRI with contrast showed a peripheral enhancing intra-axial, supratentorial lesion with hemorrhaging part and the necrotic area within the internal capsule suggesting a glioblastoma.

For intracerebral mass in a patient with HIV-AIDS, most protocols also recommend biopsy as the next diagnostic step if image features are atypical for neurotoxoplasmosis or after administration of empirical treatment not improved patient condition after 2 weeks. Current therapeutic options for glioblastoma in a patient with HIV-AIDS are similar to another patient, include surgery followed by radiotherapy and chemotherapy (temozolomide).[2, 16] The efficacy of specific antitumor therapies ultimately determines symptomatic treatment relief, but corticosteroids may temporarily help relieve neurologic symptoms caused by peritumoral edema.[7]

Surgical resection should be considered in glioblastoma to reduce the mass effect, cytoreduction, and diagnostic procedures such as histologic and molecular characterization, even in suspected low-grade glioma to provide more reliable tumor grading. However, glioblastoma is known as a very invasive tumor that may relapse in approximately 80% of cases. [6, 18, 19]

Radiotherapy following surgical resection has been shown to improve life expectancy, therefore this approach should be considered in all patients with glioblastoma.[20] To improve patient survival, several chemotherapeutic agents have been tested for the treatment of glioblastoma. Temozolomide and biodegradable polymers containing the alkylating agent carmustine, implanted into the tumor bed after tumor resection used to improved survival glioblastoma. Because glioblastoma express a high level of vascular endothelial growth factors (VEGFs), protease inhibitor preferred to use in HIV-AIDS treatment since it promoted inhibition of VEGF and decreased angiogenesis. [7, 21, 22]

In terms of prognosis, whether the tumor was a contributing factor for the accelerated progression to HIV-AIDS or, conversely, whether HIV-AIDS led to the faster growth of a tumor is still being studied. Despite a multimodal treatment, the prognosis is still grim and mostly determined by tumor progression. [1, 2]

Conclusion

It has been reported a young male recently diagnosed with HIV-AIDS with glioblastoma. The patient later died because of respiratory failure because of PCP. Because the increased incidence of non-AIDS-defining malignancies in patients with HIV-AIDS, it is important to include glioblastoma in the differential diagnosis of intracranial lesions, especially in patients presenting with neurological symptoms.

Conflict of Interest: No conflict of interest.

Funding: None.

Ethical Clearance: Not required for a case report.

Acknowledgment: The authors would like to thank to Faculty of Medicine, Airlangga University.

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