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## COMPREHENSIVE GERIATRIC ASSESSMENT IN AN OLDER PERSON LIVING WITH HIV EXPERIENCING ACCELERATED AGING. CASE REPORT

**Keywords:** HIV; Aging, Premature; Geriatric Assessment; Advance Care Planning; Terminal Care

**Palabras clave:** VIH; Envejecimiento Prematuro; Evaluación Geriátrica; Directivas Anticipadas; Cuidado Terminal

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## ABSTRACT

**Introduction:** Older adults living with HIV experience accelerated aging, which often leads to the development of geriatric syndromes such as dementia and frailty. Comprehensive geriatric assessment is an essential tool for advance care planning in these patients.

**Case presentation:** A male patient diagnosed with stage 3C HIV in 2013 at the age of 50 was admitted in April 2022 to the institutional HIV program of a quaternary care center located in Bogotá, Colombia. The patient had adequate virological control but presented with multimorbidity, complications related to immunodeficiency, and severe functional dependence, which evidenced an accelerated aging process. Following his HIV diagnosis, he was also diagnosed with nine geriatric syndromes with insidious presentation that required multiple interventions. Due to the complexity of his conditions, the patient received palliative care and died 11 years after being diagnosed with HIV.

**Conclusions:** The heterogeneity of the aging process, as well as the difference between biological and chronological age in HIV patients, demonstrates the dual biopsychosocial vulnerability of this population. Therefore, a comprehensive geriatric assessment helps optimize quality of life during the aging process and ensure patients experience dignity at the end of life.

## RESUMEN

**Introducción.** Las personas mayores con VIH presentan envejecimiento acelerado, el cual suele ocasionar el desarrollo de síndromes geriátricos como la demencia y la fragilidad. En este sentido, la valoración geriátrica integral se presenta como una herramienta fundamental en la planeación anticipada de la atención de estos pacientes.

**Presentación del caso.** Hombre diagnosticado con VIH en estadio 3C en el año 2013 a la edad de 50 años, quien en abril de 2022 ingresó al programa institucional de VIH de una institución de salud de cuarto nivel de atención ubicada en Bogotá (Colombia). El paciente tenía un adecuado control virológico; sin embargo, presentaba multimorbilidad, complicaciones derivadas de su inmunodeficiencia y dependencia funcional severa, lo que evidenciaba un proceso de envejecimiento acelerado. Después de su diagnóstico de VIH se le diagnosticaron nueve síndromes geriátricos de presentación insidiosa, por los cuales fue sometido a múltiples intervenciones. Debido a la complejidad de sus patologías, el paciente recibió atención en cuidados paliativos y falleció 11 años después de ser diagnosticado con VIH.

**Conclusiones.** La heterogeneidad del proceso de envejecimiento, así como la diferencia entre la edad biológica y la cronológica en pacientes con VIH, evidencian la condición de doble vulnerabilidad biopsicosocial de esta población. La valoración geriátrica integral en esta población permite optimizar la calidad de vida durante el proceso de envejecimiento y promueve una muerte digna.

## INTRODUCTION

In recent decades, advances in treatment have increased the life expectancy of people living with HIV. Currently, it is estimated that one-fifth of the total global population living with HIV (approximately 7.5 million people) are over the age of 50 (1). In the United States, according to data from the Centers for Disease Control and Prevention (CDC), about 41% (441 614) of the nearly 1.1 million people diagnosed with HIV in 2021 were 55 years of age or older (2). This is of great relevance, since people living with HIV are considered to be part of the population aged 50 and over due to the accelerated aging caused by this infection (1,3).

Biological aging refers to the decline in tissue and organ function, while chronological aging simply refers to the time elapsed since birth (4). Biological aging involves various biological mechanisms, such as telomere shortening, DNA damage-mediated genomic instability, epigenetic alterations, cellular senescence, and replication arrest. It has also been proposed that the accumulation of reactive oxygen species, mitochondrial dysfunction (resulting in reduced energy availability), and the dysregulation of protein homeostasis (proteostasis) play a significant role in this process, as they lead to a reduction in the immune system's responsiveness and promote the development of age-related disorders such as dementia, frailty, and cardiovascular disease (5).

HIV infection is one of the factors that accelerate biological aging (4), given that the rapid development of specific clinical geriatric syndromes in people living with HIV may potentiate a metabolic profile associated with accelerated aging (5), leading to a discrepancy between biological and chronological age (4). Although antiretroviral therapy (ART) has become more accessible in the past few years and the life expectancy of people living with HIV has increased significantly (5,6), especially in countries with high healthcare coverage (6), aging carries a higher risk of comorbidities in this population (7).

People living with HIV who receive a successful treatment not only die at an earlier age compared to uninfected individuals but also show a higher incidence of age-related disorders due to a chronic inflammatory environment and immune cell activation (5). In older persons living with HIV (OPLHIV), comprehensive geriatric assessment (CGA) considers multiple clinical and biopsychosocial factors (8). A large percentage of OPLHIV may be frail and require significant support to meet their basic needs because many of the aging mechanisms are random and changes in these individuals are heavily influenced by the environment and their behaviors (8).

When conducting a literature review for the preparation of this case report, no research was found on the early detection of risk factors for geriatric syndromes in OPLHIV in Colombia. However, a study conducted by Brañas *et al.* (3) aimed at understanding the effects of frailty, geriatric syndromes, and comorbidities on the quality of life and mortality of OPLHIV confirms that adequate assessment is

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essential for the development of care models and strategies to promote healthy aging, in order to prevent reversible conditions and improve the quality of life of these patients.

According to a report published by the Fondo Colombiano de Enfermedades de Alto Costo (Colombian Fund for High-Cost Diseases), the incidence of HIV among adults aged 50 and over in Colombia was 12.7% in 2020, with functional disability being the second most common comorbidity in this population (preceded only by sexually transmitted infections) (9). Even so, the need for a timely geriatric approach is not well acknowledged, and therefore there are still significant barriers to its implementation. The shortage of professionals specializing in geriatrics and the lack of training in the care of OPLHIV worsens the prognosis for these patients (10). This situation is particularly critical in premorbid conditions such as pre-frailty, which affects up to 60% of people living with HIV (11), including younger individuals receiving combination ART (5,10-11).

## CASE PRESENTATION

A man diagnosed with stage 3C HIV in 2013 at the age of 50, was enrolled in April 2022 to the institutional HIV program of a quaternary health care center located in Bogotá, Colombia. The patient was a native of Bogotá, had an incomplete basic education, and, after receiving his HIV diagnosis, retired from his job as a driver.

At the time of enrollment in the institutional HIV program, the patient had primary hypertension controlled with losartan (100 mg/day) and amlodipine (10 mg/day), as well as type 2 diabetes mellitus (T2DM) (diagnosed at age 51) that required treatment with insulin therapy (7 units of degludec insulin every night) and linagliptin (5 mg/day). Since joining this program, he had been receiving ART with a combination of dolutegravir (50 mg), abacavir (600 mg), and lamivudine (300 mg) in daily doses. Such therapy lasted until the last month of his life. No information is available on previous treatment regimens or adherence to them.

The patient commenced outpatient HIV treatment in 2014, and between 2016 and 2018 began to experience difficulties with episodic memory (related to the ability to recall specific situations or events), as well as attention deficits, mood swings, and social isolation. In 2020, he began renal replacement therapy (RRT) due to chronic kidney disease of diabetic etiology with interdialysis on an outpatient basis. That same year, he began to experience fecal incontinence, but the study of this condition was limited due to the measures taken by health authorities to control the COVID-19 pandemic, which affected him in 2021 causing him to be admitted for three months to the intensive care unit (ICU) of another institution, without prior immunization. During his hospital stay, he required tracheostomy and gastrostomy with subsequent closure.

Upon discharge, the patient presented with double incontinence and total dependence for basic activities of daily living. Furthermore, his family reported that

his mood had changed from “cheerful and friendly” to “unsociable.” However, until that moment, he had not experienced any self-harm episodes, only attempts to remove the hemodialysis catheter, leading to the initiation of treatment with quetiapine (25 mg) prior to RRT sessions to control behavioral symptoms.

Once he joined the institutional HIV program (April 2022), the patient underwent outpatient follow-up by a multidisciplinary team that included professionals in infectious diseases, nursing, social work, and psychology. Follow-up laboratory tests were requested, including viral load and CD4 lymphocyte count, which showed adequate virological control (undetectable viral load) but persistent immune failure (Table 1).

Table 1. Laboratory tests performed as part of patient follow-up.

Date	CD4 lymphocytes (cell/mm <sup>3</sup> )	% of CD4 lymphocytes	CD4/CD8	VL (copies/mL)*	Classification†
28/10/21	103	8.19	0.13	<20 (No detectable)	Severe immunosuppression
21/05/22	82	10.29	0.16	<20 (No detectable)	Severe immunosuppression
18/11/22	80	8.54	0.14	<20 (No detectable)	Severe immunosuppression

VL: viral load

\* VL<20 copies: not detectable.

† Immunological classification for established HIV infection according to the World Health Organization (12): not significant: CD4: >500cell/mm<sup>3</sup>; mild: CD4: 350-499 cell/mm<sup>3</sup>; advanced: CD4: 200-349 cell/mm<sup>3</sup>; severe: CD4: <200 cell/mm<sup>3</sup>.

Source: Own elaboration.

At the time of enrollment in the institutional HIV program, the patient also had a diagnosis of major neurocognitive disorder of multiple etiology (vascular and secondary to HIV infection), a depression diagnosis (without recurrent use of psychotropic drugs and without institutional characterization), and motor and visual impairments. In June 2022, the psychiatry department requested a brain MRI, which revealed neurological changes (dementia) associated with HIV/AIDS and confirmed that the patient had cerebral small vessel disease, cortical atrophy in the anteromedial region of the temporal lobes, and moderate bilateral hippocampal atrophy. Then, approximately seven months after entering the institutional HIV program, the psychiatry department performed neuropsychological tests, finding significant impairments in multiple cognitive domains (Figure 1) and behavior, as well as marked apathy, leading to a diagnosis of severe major neurocognitive disorder.

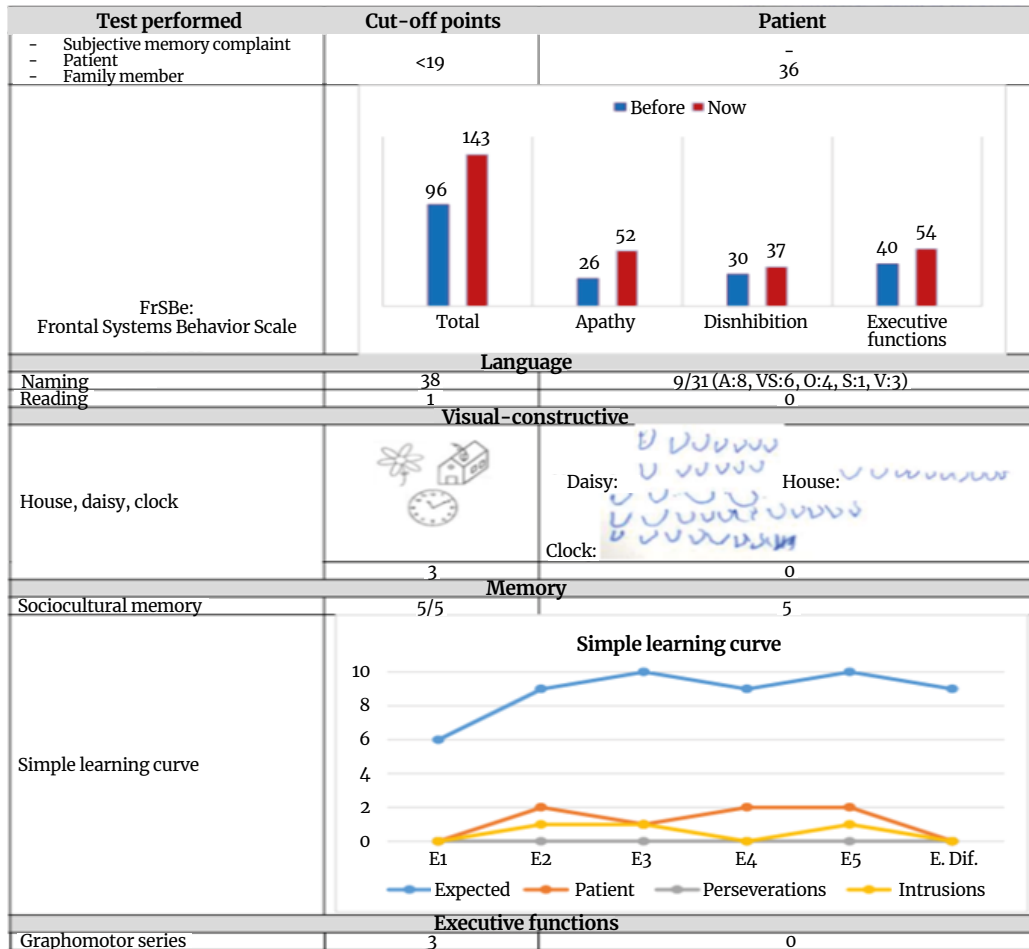


Figure 1. Neuropsychological tests.

Source: Image obtained while conducting the study.

At the end of June 2022, the patient was admitted to the same institution where he had started the institutional HIV program due to pancytopenia, severe anemia with hyperferritinemia, and hepatosplenomegaly with focal splenic lesions. During his stay, he underwent splenic biopsy and bone marrow aspiration, with no evidence of neoplasms or infection. The symptoms were associated with the need for frequent transfusions due to RRT (transfusion support of 2–3 units of red blood cells per month beginning in 2022 until the period prior to his death).

Similarly, the initial tests requested included a bone marrow culture, and the results made it possible to diagnose the patient with miliary tuberculosis that spread through the blood. Although detailed information on the tuberculosis treatment regimen administered during the intensive phase is not available, as it was administered on an outpatient basis, it is known that the patient completed the continuation phase with isoniazid (150 mg/day), rifampicin (300 mg/day), and pyridoxine (50 mg/day).

Since February 2023, the patient was repeatedly hospitalized due to falls, odontogenic cellulitis, persistent delirium (predominantly hypoactive), and a complicated upper urinary tract infection. Concomitantly, he sustained four pressure injuries (PIs) on his buttocks and on the dorsal side of his left foot (at the level of the talus bone), which were diagnosed by the geriatric service. Taking into account the patient’s clinical and functional condition (Table 2), the geriatric service suggested a CGA to evaluate decision-making in the scenario described and the formulation of short- and medium-term therapeutic objectives. However, this approach was not authorized as it was considered inappropriate for a 60-year-old patient.

Table 2. Clinical assessment performed by the geriatric service.

Domain assessed	Findings
Functional and cognitive	Complete dependence for performing BADL (score of 0/100 on the Barthel scale) and severe dementia of multiple etiologies.
Intrinsic factors	Dementia, delirium, immobility, polypharmacy, and malnutrition.
Extrinsic factors	Constant pressure, friction, skin atrophy (thinning of the skin), and double incontinence.
Risk of PIs	Norton scale: 7/20 (high risk). During the last hospitalization, he presented with 3 PIs.
Social determinants	Single patient with three siblings, living with two of them. Caregiver overload identified.

BADL: basic activities of daily living; PIs: pressure injuries.

Source: Own elaboration.

In May 2023, the size of the splenic lesions increased, so the infectious disease department requested a second biopsy. However, the patient’s family declined the procedure, arguing that the findings would not change the course of his disease or improve his quality of life if treated, and that they preferred not to perform it as it was a high-risk procedure that could worsen his condition. In view of the above, the institution’s clinical ethics committee was asked for its opinion, and it suggested reorienting the therapeutic plan toward symptom relief, suspending interventions considered futile, and prioritizing patient comfort.

During the same month, the case was evaluated by the palliative care team with the aim of analyzing the feasibility of discontinuing transfusions and hemodialysis. However, these treatments were maintained because the primary caregiver requested to wait for authorization from other family members. At that time, the patient was discharged at the request of the primary caregiver following a meeting with the palliative care team and the attending physician, and he continued outpatient follow-up with the infectious disease, nephrology, and endocrinology specialists. In June 2023, he was referred from his hemodialysis unit to outpatient palliative care due to failure to meet objectives. Moreover, the primary caregiver reported that before the patient lost consciousness (April 2023), he had signed

an advance directive refusing dialysis. At that time, the family had also reached a consensus to discontinue blood transfusions and hemodialysis.

Given that the patient was completely dependent for the performance of BADLs (score of 0/100 on the Barthel scale) and had a high risk of mortality (score of 18/30 on the PROFUND index), he was admitted to the home-based palliative care program and ultimately passed away a few days later.

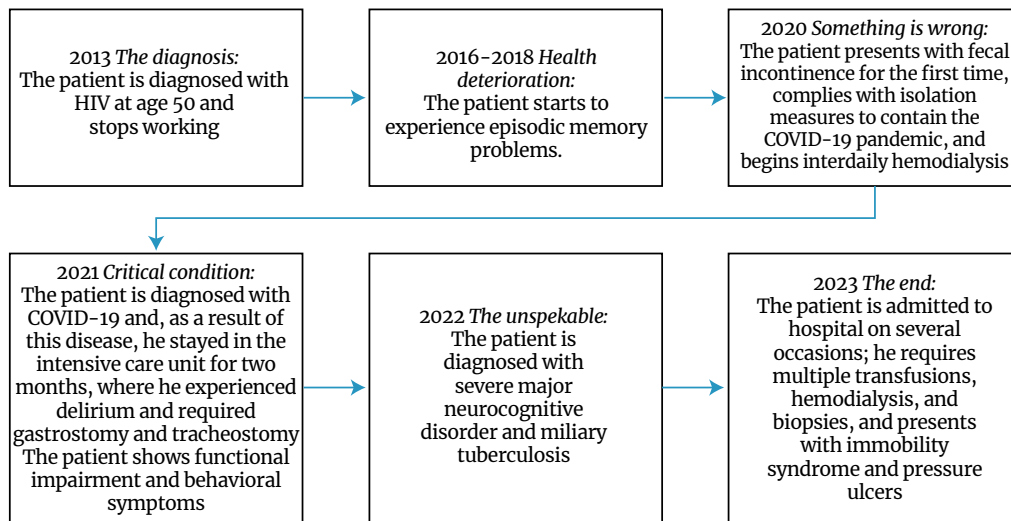


Figure 2. Case timeline.

Source: Own elaboration.

## DISCUSSION

Aging in people living with HIV is characterized by a series of multifactorial conditions that affect both their overall health and their medical care, increasing the complexity of treatment and management. This highlights the need to establish a comprehensive approach to address accelerated aging in this population (5).

HIV is a determining factor in the acceleration of biological aging (4). In this case, the patient's chronological age was inconsistent with his biological age, which became evident shortly after being diagnosed with HIV when he began to develop the usual comorbidities associated with OPLHIV, such as DM2, chronic kidney disease, and immune failure (3,13), with the latter being identified years prior to the diagnosis of miliary tuberculosis. The patient also exhibited several risk factors (depression, polypharmacy, chronic immune activation, among others) (8,3,14) and required multiple prolonged hospital stays (in the ICU with the use of ostomies), resulting in complications and interventions that contributed to his functional decline and the onset of geriatric syndromes (15) such as frailty, incontinence, falls, PIs, cognitive impairment, delirium, polypharmacy, malnutrition, and immobility (8,3,14,16), which led to complete dependence for the performance of basic activities of daily living.

In the present case, although no potential for rehabilitation, caregiver overload (17), and a delay in the initiation of palliative care were found during PIs assessment, the treating team blocked access to a CGA, resulting in the patient undergoing multiple unnecessary interventions, which led to various clinical complications. Given the foregoing, this case report is intended to describe this patient's journey and highlight the importance of conducting a comprehensive and timely assessment of people living with HIV, as the accelerated aging they experience can complicate their health situation.

In this patient, clinical deterioration began after he retired from work, when he showed signs of isolation and memory loss. Subsequently, there were situations in which he attempted to remove his hemodialysis catheter, which is understandable considering that he had expressed his advance wish not to continue with dialysis. Likewise, he was diagnosed with a depressive disorder, and although it has been established that rates of depression and cognitive impairment in patients living with HIV are high (11,18), these conditions must be addressed due to their potential impact on patients' overall health. However, it was unclear what psychological support he received.

It should be noted that the patient had access to the necessary and appropriate treatment plans for his conditions, based on a biomedical approach and using a multidisciplinary approach. Nonetheless, when conceptualizing health in terms of functionality, it is clear that the CGA can be an especially useful structured and systematic tool for the care of people living with HIV, as this condition causes accelerated aging, causing various geriatric syndromes (11,17).

This case report demonstrates the need for a healthcare system that is more responsive to the aging process in HIV (8,18). During this process, patients should receive multidimensional, continuous care that focuses on the individual and their caregivers. The purpose of this is to identify psycho-emotional and medical needs, establish indications for intervention, and therefore prevent moral distress and optimize support with shared goals until the end of life (11,15,17,19).

Determining the optimal moment to perform a CGA, initiating the transition to palliative care, and implementing advance care planning remains a clinical challenge. Accordingly, it is proposed to go beyond approaches focused exclusively on functionality, the management of comorbidities, socialization, or social security issues. Therefore, exploring and understanding what the person and their caregivers really worry about is essential to providing individualized, need-based care (20).

Colombia urgently needs to implement a geriatric care model focused on OPLHIV, which coordinates health services with educational processes that acknowledge the heterogeneity of this doubly stigmatized population (historically and socially). This model should promote comprehensive care, improved quality of life, and empowerment of OPLHIV in line with the principles proposed in the Glasgow Manifesto of the International Coalition of Older People with HIV (21).

## CONCLUSIONS

This case report highlights the importance of understanding the experience of older persons living with HIV in the context of a health care system in which challenges to person-centered care persist. Although Colombia has made progress in HIV coverage and management, training for professionals in geriatric care and palliative care is limited, hindering comprehensive and timely care as patients age. In this regard, CGA is proposed as a fundamental and cross-cutting tool in OPLHIV care, since its implementation not only optimizes quality of life throughout the aging process, but also promotes a dignified death while offering support to caregivers.

## ETHICAL CONSIDERATIONS

Informed consent (verbal and written) for the preparation of this case report was obtained from the patient's legal guardian following his death.

## CONFLICTS OF INTEREST

None stated by the authors.

## FUNDING

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