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## Brief communication

# Cardiovascular disease in human immunodeficiency virus-infection as a cause of hospitalization: a case-series in a General Hospital in Peru



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## ABSTRACT

**Background:** Cardiovascular disease in the context of human immunodeficiency virus infection has become a major clinical concern in recent years. In the current report we assess hospitalizations due to cardiovascular disease in human immunodeficiency virus patients in a Social Security reference hospital in Peru.

**Methods:** A retrospective study was carried out between January 1996 and December 2012 in a General Hospital in Lima, Peru.

**Results:** We included 26 patients hospitalized due to cardiovascular disease. Mean age was 46.3 years (SD 12.5), predominantly male (57.7%). Ten patients (38.4%) were in Acquired Immunodeficiency Syndrome stages. Seventeen (65.4%) received high-active-antiretroviral therapy. Eleven (42.3%) had cardiac involvement and 15 (57.7%) had non-cardiac vascular involvement. The most frequent causes of cardiac involvement were pericardial effusion and myocardial infarction. On the other hand, deep vein thrombosis and stroke were the most frequent for non-cardiac vascular involvement.

**Conclusions:** Cardiovascular disease is an important cause of hospitalization in Peruvian human immunodeficiency virus patients, with differences between immunosuppression stages. Further studies analyzing associated factors are warranted.

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Human immunodeficiency virus (HIV) infection has been characterized by significant immunosuppression states that predispose patients to opportunistic infectious and neoplasias, as well as progressive dysfunction of organs and systems.<sup>1</sup> Since 1981, HIV infection, and particularly the Acquired Immunodeficiency Syndrome (AIDS), has evolved drastically from an acute lethal condition, with no therapeutic options, to a chronic disease with multiple available therapeutic regimens.<sup>2</sup> Unfortunately, AIDS epidemic affects primarily young adults, including a percentage of skilled educated persons causing high economic impact. Furthermore, it is still associated with stigma that could probably limit the response to this epidemic.<sup>3</sup> In Latin-America there are important differences between countries. According to data from ONUSIDA and CELADE, in 2010 there were 75,000 HIV-infected patients in Peru with a prevalence of 2.5 per 1000 inhabitants, being sexual intercourse the most important route of transmission (97%).<sup>4</sup>

Highly active antiretroviral therapy (HAART) significantly reduced morbidity and mortality related to AIDS-defining opportunistic diseases (ODs).<sup>4</sup> Since the introduction of dideoxynucleoside reverse transcriptase inhibitors (NRTIs) in 1985 and after the approval of the first protease inhibitor in 1995, the availability of new fixed-dose combinations regimens of new antiretroviral drugs, evolved faster in the developed world. Unfortunately, this is not the situation in low- and middle-income countries, especially in the rural setting, where HIV now is common.<sup>5</sup> The successful role of HAART has extended life expectancy and enhanced the overall well-being of HIV-infected individuals. Moreover, recent reports demonstrated that HAART could be useful strategy in prevention, as well as in treatment, point out the importance of drug adherence.<sup>4,5</sup> In Peru, EsSalud, a major social security health provider, incorporated HAART in 2001 with increasing coverage, as the medical and patient communities readily accepted it.<sup>4</sup>

However, there are increased concerns regarding HAART-mediated metabolic derangements and its potential risk for cardiovascular diseases (CVD) in the long term,<sup>1,3,5</sup> especially when certain classes of antiretroviral drugs, such as the protease inhibitors (PIs) are strongly implicated in this process.<sup>6</sup> CVD in HIV infection may result from cardiac involvement upon presentation of ODs in the presence of advanced immunosuppression, be a consequence of HIV-induced immune activation or derive from antiretroviral therapy-associated dyslipidemia and insulin resistance.<sup>7</sup> Besides that, such consequences have not been particularly addressed in Latin American countries, including Peru.<sup>1-7</sup>

CVD in patients with HIV infection, must be diagnosed and treated, because there is growing incidence, due to factors associated with the infection or with the use of some therapies.<sup>6</sup> According to the Joint United Nations Program on HIV and AIDS (UNAIDS) 2013 report, it has been estimated that 35.3 million were infected all over the world in 2012 (32.2 million–38.8 million). However, the annual incidence of new cases are decreasing as a consequence of HAART use.<sup>8</sup> Nonetheless, if on one hand new complex therapeutic regimens have favorably impacted life expectancy, on the other hand some clinical situations like CVD or adverse events have become very relevant.<sup>6,9</sup> Investigations assessing these

negative consequences of HAART should be conducted in settings like Peru, where there have no previous studies.<sup>10-15</sup>

Therefore, the aim our study was to describe the CVD complications as a cause of hospitalization in HIV-infected patients, in every stage of disease, in a General Hospital of Social Security in Lima, Peru.

We carried out a retrospective observational study (case series) at the Edgardo Rebaglatti Martins Hospital, a reference hospital from Peruvian Social Security (EsSalud), with 1500 beds, at Lima, Peru. This report corresponds to the period between January 1996 and December 2012.

Every hospitalization at the Infectious Diseases Unit during the study period was reviewed, looking for the diagnosis of HIV infection that ought to be described in the diagnosis list filled in at hospital admission and discharge. At discharge, diagnosis of “acute pericarditis”, “other diseases of pericardium”, “unstable angina”, “acute myocardial infarction”, “myocarditis”, “acute and subacute endocarditis”, “heart failure”, “cerebral infarction”, “intracerebral hemorrhage”, “thrombophlebitis”, “pulmonary embolism”, and “primary pulmonary hypertension”, according to ICD-10 classification, were reviewed.

Cardiovascular risk factors were defined as follows: arterial hypertension according to recommendations of the Seventh Joint National Committee or if the patient reported to be on hypertensive treatment; diabetes was defined if the patient had glucose level of 126 mg/dL or greater in two separate occasions, or if the patient was on treatment for this condition. Dyslipidemia was considered if the patient had total cholesterol of 200 mg/dL or greater, or were receiving hypocholesterolemic drugs. Obesity was considered when in patients with a body mass index of 30 or greater. Finally, a patient classified as smoker if he smoked any number of cigarettes at the time of hospital admission or had quit smoking less than a year before.

Data of clinical records of the eligible patients were abstracted using a form built for this study. Analysis was performed using the Statistical Package for Social Science (SPSS) version 21.0 (IBM Corporation 1994, 2014, USA). At descriptive level numeric variables were presented as means and standard deviations (SD) if they had normal distribution or with medians and interquartile ranges (IQR) if they had not. Categorical variables are showed as absolute frequencies and percentages.

We included 26 hospitalized HIV-infected patients with CVD in study period. No patient had more than one hospitalization for the same reason. Mean age was 46.3 years (SD 12.5), and were predominantly male (57.7%). Ten patients (38.4%) fulfilled the definition of AIDS. Out of the 17 (65.4%) patients who had received HAART, eight had received protease inhibitors. The overall median time of HAART use was 48 months (IQR 72), and of HAART including protease inhibitors was 72 months (IQR 90).

Prevalence of cardiovascular risk factors was low, with 15.4% with arterial hypertension and dyslipidemia, and type 2 diabetes or smoking in 7.7% (Table 1).

Eleven patients (42.3%) had some type of cardiac alteration and 15 (57.7%) had some type of vascular non-cardiac problem. The most frequently cardiac alterations were pericardial effusion (15.4%) and myocardial infarction (11.5%); among

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