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Assessing the impact of HAART on the incidence of defining and non-defining AIDS cancers among patients with HIV/AIDS: A systematic review

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Acquired immunodeficiency syndrome; Highly active antiretroviral therapy; Carcinoma; Incidence

Summary After highly active antiretroviral therapy (HAART) became widespread, several studies demonstrated changes in the incidence of defining and non-defining AIDS cancers among HIV/AIDS patients. We conducted a systematic review of observational studies evaluating the incidence of malignancies before and after the introduction of HAART in people with HIV/AIDS. Eligible studies were searched up to December 2012 in the following databases: Pubmed, Embase, Scielo, Cancerlit and Google Scholar. In this study, we determined the cancer risk ratio by comparing the pre- and post-HAART eras. Twenty-one relevant articles were found, involving more than 600,000 people with HIV/AIDS and 10,891 new cases of cancers. The risk for the development of an AIDS-defining cancer decreased after the introduction of HAART: Kaposi's sarcoma (RR = 0.30, 95% CI: 0.28–0.33) and non-Hodgkin's lymphoma (RR = 0.52, 95% CI: 0.48–0.56), in contrast to invasive cervical cancer (RR = 1.46, 95% CI: 1.09–1.94). Among the non-AIDS-defining cancers, the overall risk increased after the introduction of HAART (RR = 2.00, 95% CI: 1.79–2.23). The

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incidence of AIDS-defining cancers decreased and the incidence of non-AIDS-defining cancers increased after the early use of HAART, probably due to better control of viral replication, increased immunity and increased survival provided by new drugs.
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Introduction

Since 1996, when highly active antiretroviral therapy (HAART) became widespread in North America, Europe and Australia, the mortality rate in HIV-infected patients dropped dramatically, mainly because of the decrease in the incidence of opportunistic infections. In addition to life expectancy, the therapy also affected the epidemiology of non-AIDS-defining cancers (NADCs) and has an important impact on the evolution of these tumors [1].

Before HAART, cancers were responsible for less than 10% of deaths among HIV-infected patients [1]. After HAART, 28% of deaths in this population have been attributed to neoplastic causes [2], despite the substantial decline in the risk of acquiring AIDS-defining cancers (ADCs), especially Kaposi's sarcoma (KS) and non-Hodgkin's lymphoma (NHL) [3]. It is believed that this phenomenon occurs as

a function of the increase in the incidence and mortality of NADCs [4]. However, it is still not clear in the literature whether the higher incidence of carcinomas in the post-HAART era is only due to the larger number of new cases of NADCs or if there are other factors involved, such as the longer life expectancy afforded by HAART [3].

Some studies speculate that as HIV patients live longer after the introduction of HAART, there is a greater potential to develop cancers [5]. Other authors believe that the association between different risk factors, such as HIV-infection chronicity and its probable oncogenic role, may be involved [2].

In fact, despite the advances in medicine, cancer is now one of the leading causes of death among patients who live with HIV [6]. This article aims to provide a systematic review to evaluate the impact of HAART on the incidence of defining and non-defining AIDS cancers.

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