Facts and Stats: HIV and cancer risk

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Have you watched the movie Philadelphia? (Spoiler alert) There is an important scene where Tom Hanks' character reveals his skin lesions as visible proof that he had AIDS, proving that he was fired because he had AIDS. These skin lesions are a manifestation of Kaposi's sarcoma, a cancer often associated with AIDS since the early years of the epidemic.

People living with HIV face a greater risk of developing cancer, experiencing a more severe clinical course, a reduced response to treatments, and lower survival rates (1–4). Compared to the general population, people living with HIV are not only at greater risk of developing AIDS-defining cancers (e.g., Kaposi's sarcoma, non-Hodgkin lymphoma and cervical cancer), but also other virus-related cancers such as liver cancer and Hodgkin's lymphoma, as well as virus-unrelated cancers like lung cancer (1). For example, in Africa (where the HIV epidemic is most burdensome), HIV contributes to 21% of cervical cancers (5). Furthermore, around 10% of deaths in people living with HIV are attributed to cancer (6).

Risk in numbers (1)

Compared to the general population, people living with HIV have:

- **498** times higher risk of developing Kaposi's sarcoma
- **12** times higher risk of developing non-Hodgkin's lymphoma
- **7** times higher risk of developing Hodgkin's lymphoma
- **3** times higher risk of developing cervical cancer
- **3** times higher risk of developing liver cancer
- **2** times higher risk of developing lung cancer
- **2** times higher risk of developing larynx cancer

MECHANISMS

HIV contributes to cancer development in individuals with additional risk factors through two mechanisms: chronic inflammation and immunodeficiency. Chronic inflammation promotes the progression of initial lesions into invasive cancer. Impaired immunological function reduces tumor surveillance, hampers the ability of the people living with HIV to clear oncogenic virus infections, and increases the reactivation of latent infections. This is evident in cases involving hepatitis B virus and liver cancer, as well as human papillomavirus and cervical cancer. While less than 5% cancers in the general population are associated with oncogenic virus infections, this association is up to 40% in in people living with HIV. There is also growing evidence suggesting that HIV could induce malignant transformation and enhance malignant capacity of other oncogenic viruses, and hence directly increase the risk of cancer (3,5,7,8).

HIV TREATMENT

Since its introduction in 1996, HIV treatment has significantly improved the survival and quality of life of people living with HIV. It had also had some impact in reducing the occurrence of AIDS-defining cancers (3,9). For example, women on HIV treatment had a lower incidence of cervical precancerous lesions and invasive cervical cancer than their counterparts without HIV treatment (10). Similarly, the incidence of Kaposi´s sarcoma and non-Hodgkin lymphoma have declined by more than 80% and 50%, respectively, following the introduction of HIV treatment. Nevertheless, the frequency of these cancers remains higher among people living with HIV than in the general population, suggesting that the effect of early immunosuppression due to HIV could not be entirely reversed by restoration of the immune system; with chronic inflammation (persisting even with long-term viral suppression) playing an equally significant role. Conversely, with increased survival, the risk of non-AIDS-defining cancers, such as liver cancer and lung cancer, has increased among people living with HIV (3).

It is worth noticing that the impact of HIV extends beyond cancer development, posing challenges when staging tumors due to non-cancer associated lymphadenopathy. Moreover, during cancer treatment, HIV-related thrombocytopenia might increase the complications associated with surgery and chemotherapy (8).

TAKE HOME MESSAGE

When addressing cancer, it is important to consider specific subpopulations at greater risk of developing cancer with early onsets and courses that are more aggressive. It is imperative to have timely diagnosis and treatment in these populations. Moreover, preventions measures, such as vaccinations, should always be prioritized.

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