



## HIV-Infection Prediction and Co-morbid Risks for Cancer

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### Introduction

Prevalence and incidence of HIV-infections, as described by prevailing risk factors including partnership factors, stress levels and drug use/abuse imply that the incidence of cancer progression among infected individuals involves several self-destructive behaviors demanding attention. Relationship between sexual functioning, sociodemographic factors, biomedical markers, and depressive symptomatology all affect the general health prognosis for HIV-individuals.

### Prediction and Co-morbid Risks

Serodiscordant relationships are defined by situations in which one partner is infected by HIV and the other remains uninfected, as opposed to serocordant relationships in which both partners are infected by the virus. In serodiscordant relationships, partners face a specific challenge due to the ongoing situation that one partner in that relationship is positive for HIV. Among serodiscordant partners, the question arises as to which risk factors are more likely to be associated with the disorder condition. In a large cohort of serodiscordant co-habiting partner-couples in Zambia (N=3049), genetic assays were used to classify the incident of infections whether acquired from the case partner (linked) or were acquired from an outside partner (unlinked). The risk for female unlinked infection was associated with drunkenness reports on weekly/daily basis vs. moderate/non-drinkers at baseline, genital inflammation at the time of follow-up with adjustments for age, years of co-habitation, income level, contraceptive use, previous pregnancies, history of sexually transmitted infections, and sexual indulgence with case partner without use of condoms [1]. Concurrently, the risk of male participant unlinked infection was associated with genital inflammation or genital ulceration, report of more than one outside sexual partner during follow-up, and report of drunkenness weekly/daily versus moderate/non-drinkers at baseline, control for age level, income, circumcision status, and history of sexually transmitted infection. A risk-prediction algorithm for HIV transmission from a South African cohort (N=8982) has identified seven factors as being significant predictors for HIV infection, these include greater than 25 year-of-age, status of single/not co-habiting, parity (more than 3), age at sexual debut (more than 16 years), more than three sexual partners, applications of injectable substances and prevailing diagnosis with a sexually transmitted infection(s) [2]. Among women with HIV-infection, perceived stress predicted heavy alcohol drinking with accompanying co-morbidities [3]. The incidence of anal cancer in HIV-infected individuals is increased by an alarming 28-fold [4-6]. It has been shown also that deleterious sexual functioning affects individuals presenting HIV in several respects that are related to negative biomedical and psychosocial factors [7]. Among these latter factors the presence of transdiagnostic vulnerabilities, e.g. smoking and mental health issues, are found to regulate general health parameters [8].

It has been found that males indulging in sexual intercourse with other males present a four times greater likelihood to be screened for anal cancer than otherwise while males indulging in sexual intercourse with other men were six times more likely to have follow-up diagnosis following an abnormal anal Pap test in comparison with heterosexual men or women of any type of sexual orientation [9]. New HIV infections

in men who have sex with men occur principally among conglomerates of acutely HIV-infected prolifically-promiscuous sexually active young men, within whom the acquisition and transmission of infection are related in space and time [10]. By the time the adopted antiretroviral treatment for prevention renders its effects, most of the new HIV infections in men who have sex with men would have occurred already. Taken on a global level, fewer than 6% of all reports regarding the HIV care-cascade from 1990 to 2016 included men who have sex with men, and only 2.3% concerned men who have sex with men in low/middle-income countries. Studying the expressions of human papillomavirus biomarkers for the prediction of anal histological high-grade squamous intraepithelial lesions in gay and bisexual men (N=617), aged 49 years, living in Sydney, Australia, it was found that all the disease biomarkers were associated markedly with the grade of human papillomavirus-associated anal lesions [11]. Risk factors for cancer in general among a Chinese population of HIV-infected individuals were: current smoking; 30.3%, current alcohol consumption; 24.4% and overweight and obesity 12.5% [12]; in this context, trends for individuals with AIDS also express the increased risk for developing cancers [13]. Further, Anal carcinoma expresses an elevated incidence among HIV- and AIDS-presenting individuals with human papillomavirus infection as the etiological basis of disorder thereby rendering more essential the adequate diagnosis and treatment of the precursor lesions, i.e., anal intraepithelial neoplasia [14]. A strongly marked burden of anal high-risk human papillomavirus infection, abnormal anal cytology, and high-grade squamous intra-epithelial lesions was observed in the cross-sectional cohort of HIV-infected female patients, aged 25-65 years, that were recruited from an HIV clinic in Johannesburg, South Africa [15], a sober indication of the prevalence of anal dysplasia in HIV-infected women from sub-Saharan Africa. Among HIV-negative women single low-risk human papillomavirus infections occurred in 12% of the women and multiple single low-risk human papillomavirus infections in 2%, with single high-risk human papillomavirus infections in 9%, and multiple high-risk human papillomavirus infections among 2% of the women. Single low-risk human papillomavirus infections were persistent in 6%, without persistent multiple high-risk human papillomavirus infections, with single high-risk human papillomavirus infections persistent in 4% and multiple high-risk human papillomavirus infections were persistent in 0.3%. On the other hand, among HIV-positive women at baseline, single low-risk human papillomavirus infections occurred in 19%, multiple single low-risk human papillomavirus in 6%, single high-risk human papillomavirus infections occurred in 17%, and multiple high-risk human papillomavirus infections in 12% [16].

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## Conclusion

In summary, the conditions determining prevalence and incidence of HIV-infection, whether or not culminating in AIDS, seem defined by several risk factors among which partnership factors, stress levels and drug use/abuse ought to be attended to; concurrently, the incidence of cancer development among infected individuals is indicative of a myriad of self-destructive behaviors, such as sexual habits, suitable for preventive and interventional measures.

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