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## Influence of HIV-related immunodeficiency on the risk of hepatocellular carcinoma

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### Objective

To investigate HIV-related immunodeficiency as a risk factor for hepatocellular carcinoma (HCC) among persons infected with HIV, whilst controlling for the effect of frequent co-infection with hepatitis C and hepatitis B viruses.

### Design

A case-control study nested in the Swiss HIV Cohort Study (SHCS).

### Methods

Twenty-six HCC cases were identified in the SHCS or through linkage with Swiss Cancer Registries, and were individually matched to 251 controls by SHCS centre, gender, HIV-transmission category, age and year at enrolment. Odds ratios (OR) and corresponding confidence intervals (CI) were estimated by conditional logistic regression.

### Results

All cases and 53 percent of controls (92% of controls among intravenous drug users [IDU]) were positive for hepatitis B superficial antigen (HBsAg) or antibodies against HCV (anti-HCV). HCC cases included 14 IDU (three positive for HBsAg, 13 for anti-HCV), and 12 men having sex with men (MSM)/heterosexual/others (11 positive for HBsAg, three for anti-HCV), revealing a strong relationship between HIV transmission route and hepatitis viral type. Latest CD4+ cell count was significantly

associated with HCC (OR for lowest *versus* highest tertile = 4.26, 95% CI: 1.18–15.5). This effect was concentrated among MSM/heterosexual/others (OR = 18.2, 95% CI: 1.61–207) rather than IDU (OR = 1.79, 95% CI: 0.39–8.23). HAART use was not significantly associated with HCC risk (OR for ever *versus* never = 0.59, 95% CI: 0.18–1.91).

### Conclusion

More than CD4+ cell counts increased the risk for HCC among persons infected with HIV, an effect that was particularly evident for HBV-related HCC arising in non-IDUs.