Respiratory disease factors link with reduced SARS-CoV-2 susceptibility in PWH

352

Irene. A. Abela[1,2] , Anthony Hauser[1] , Chloé Pasin[1] , Magdalena Schwarzmüller[1], Huldrych F.Günthard[1,2], Alexandra Trkola[1], Roger D. Kouyos [1,2] , for the Swiss HIV Cohort Study

[1]Institute of Medical Virology, University of Zurich, Zurich, Switzerland ,[2]Division of Infectious Diseases and Hospital Epidemiology, University Hospital Zurich, Zurich, Switzerland

BACKGROUND

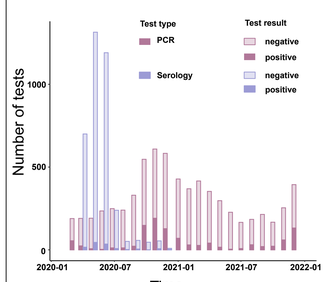
Despite favorable vaccine responses of people with HIV (PWH), **susceptibility to SARS-CoV-2 infection** and increased risk of COVID-19 in immunocompromised PWH continue to be of concern.

Here, we searched the **Swiss HIV Cohort Study (SHCS)** with >10'000 actively enrolled, optimally treated PWH to identify factors associated with SARS-CoV-2 infection in the pre-and post-vaccination area.

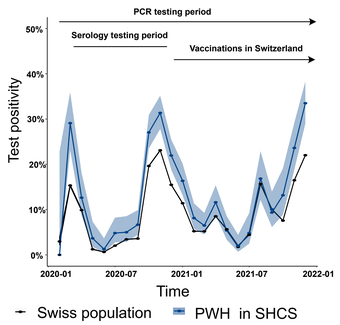
METHODS AND RESOURCES

We utilized information on SARS-CoV-2 events **reported to the SHCS in 2020 -2021**. To detect asymptomatic infection, we screened **pre-pandemic** (2019) and **pandemic** (2020-2021) bio- banked plasma for SARS-CoV-2 antibodies.

PCR and serological tests in the SHCS



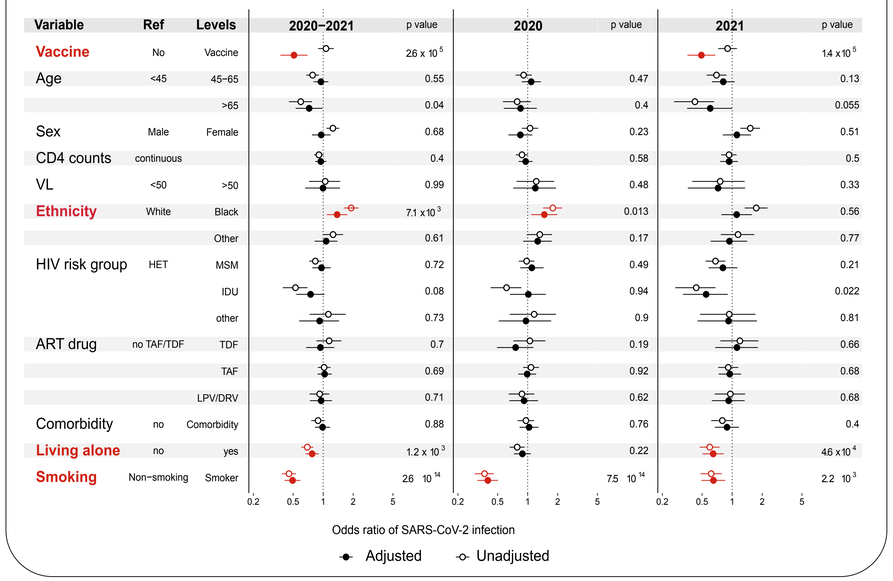
PCR positivity in PWH and in the Swiss population



SARS-CoV-2 infected and matched SARS-CoV-2 uninfected PWH were additionally screened for antibodies against S1 of the four endemic circulating human coronaviruses (HCoV). Data were compared to HIV negative controls. SARS-CoV-2 data and 25 behavioral, immunologic and disease-parameters available in the SHCS data base were analyzed by logistic regression, conditional logistic regression, and Bayesian multivariate regression.

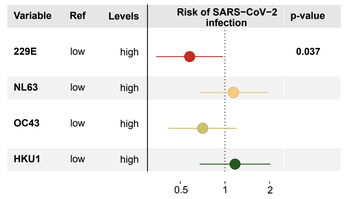
RESULTS

Risk of SARS-CoV-2 acquisition: No impact of HIV infection but strong impact of smoking and living alone

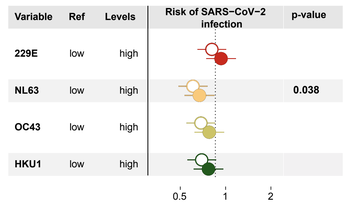


High pre-pandemic (2019) HCoV antibody levels are associated with a lower risk of subsequent SARS-CoV-2 infection

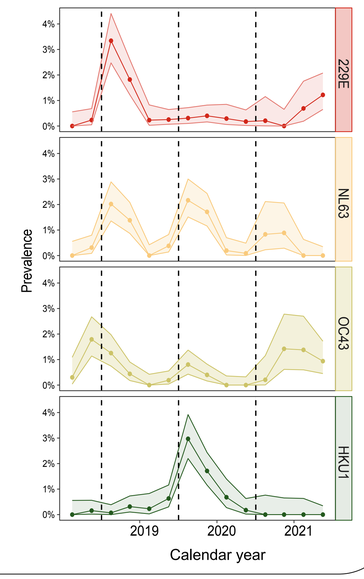
Impact of pre-pandemic (2019) HCoV antibody levels on SARS−CoV−2 infection (matched PWH case−control study)



Impact of HCoV antibody levels during early pandemic period (2020) on subsequent SARS−CoV−2 infection

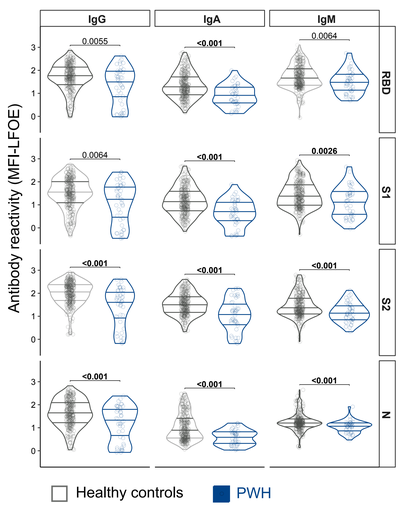


Patterns of HCoV type prevalence diagnosed during 2019-2021

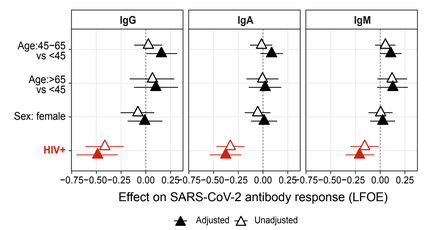


Dissecting factors that influence the SARS-CoV-2 antibody response

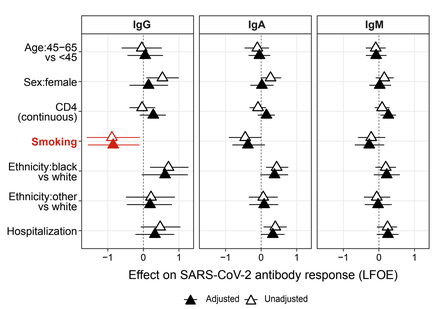
SARS−CoV−2 antibody response in PWH and healthy controls



Determinants of SARS-CoV-2 antibody responses in PWH and healthy controls: basic parameter screen

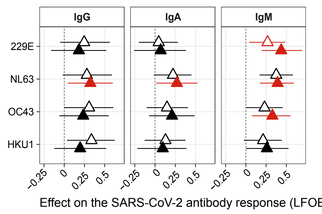


Determinants of SARS-CoV-2 antibody response in PWH: extended parameter screen

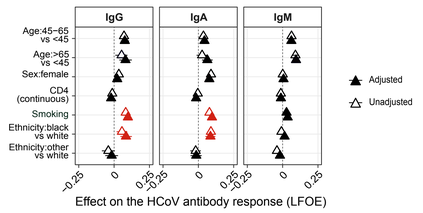


Dissecting the cross-talk between HCoV immunity, SARS-CoV-2 antibody responses and host demographics

Impact of pre-existing HCoV immunity on SARS−CoV−2 antibody responses following infection



Determinants of the HCoV antibody response
Observation period 2020-2021



CONCLUSIONS

Our unbiased cohort screen identified **two factors** affecting the respiratory environment - **smoking and immunity to HCoV responses** - that were associated with **reduced susceptibility to SARS-CoV-2**. Both factors are relevant to the general population. HIV-linked factors were not associated with increased SARS-CoV-2 infection risk but **overall weaker SARS-CoV-2** Ab responses in PWH are of concern and need to be monitored to ensure infection- and vaccine-mediated protection from severe disease.

ACKNOWLEDGEMENTS

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