Evidence of reinfection with SARS-CoV-2 variants:


**Findings:** 1. NVX-CoV2373 vaccine (Novovax) was 51% efficacious against B.1.351 with no hospitalized patients. 2. Noteworthy, 30% of subjects in the study were seropositive for SARS-CoV-2 and there was no difference in symptomatic COVID-19 between seronegative and seropositive subject at 2 month follow-up (5.3% vs 5.2%). 3. Genome sequencing was available in 41 subjects with 38 (92.7%) being of the B.1.351 variant. 4. Subjects at the start of the study who were seropositive and subsequently developed COVID-19 at 2 months were thought to be reinfected with B.1.351.

- **Brazilian variant P.1.** Sabino EC. Resurgence of COVID-19 in Manaus, Brazil, despite high seroprevalence. Lancet. 02.06.2021;397 (10273):452-455. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00183-5/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00183-5/fulltext)

**Findings:** 1. In Manaus, Brazil, a study of blood donors revealed that 76% of the population had been infected with SARS-CoV-2 in October 2020. 2. Hospitalizations had remained stable for 7 months from May to November 2020 and then a surge occurred in December 2020 and the following month. 3. The P.1 mutation was discovered in Manaus in December 2020 during the resurgence suggesting waning of initial immunity or increased transmissibility to those not previously exposed to the variant. The latter seems more likely given what is known of protection from natural infection.

Modified from Sabino EC:

The fear is that variants of concern not only dominate prevalence due to increased transmissibility but that they escape natural and vaccine induced immunity. This article suggests the former is occurring as vaccination was not yet available.

Other References:


Importance of Testing: 1. Diagnostic testing informs clinicians of the need for quarantine or therapy; surveillance testing informs public health policy; and screening large groups of people maps out where the virus is going and potential hot spots. 2. Ring vaccination, a proven strategy with smallpox and Ebola, utilizes testing to identify hot spots and then vaccinates selectively around the outbreak. 3. Genetic sequencing identifies the viruses in circulation and identifies new variants of concern (VOC). 4. The fear is that VOC may develop that escape natural and induced immunity, no longer be suppressed by our current vaccines, and/or limit the usefulness of evolving therapies (monoclonal antibodies). The US has never had a robust testing strategy other than to maintain professional sports seasons. We have also been behind in sequencing but more funds have been directed toward this activity.

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Premise/Methods: 1. Serum NAB appear after SARS-CoV-2 infection and vaccination and are maintained for several months. 2. It is unclear if a similar response after infection with variants occur. 3. Serum samples were obtained from SARS-CoV-2 infection within 5-19 days of symptom onset; infected convalescent patients 32-94 days after symptom onset; and after the second dose of an mRNA vaccine. 4. Four variants were examined for inducing NAB in live-virus focus reduction neutralization tests (FRNTs).

Findings: 1. This study found neutralizing activity of infection- and vaccine-elicited antibodies against 4 SARS-CoV-2 variants, including B.1.1.7. 2. As additional variants emerge, neutralizing-antibody responses after infection and vaccination should be monitored for adequate NAB. It is noteworthy that studies that assess the response of T helper and killer cells following SARS-CoV-2 infection maintain that response to variants and to the current vaccines. The exception may be the Brazil P.1 lineage as noted in the review article above. It appears that seropositive individuals are not protected from the P.1 variant. Protection from the current vaccines remains to be studied though it is thought that protection against hospitalization and death occurs.

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**Premise/Methods:** 1. It remains unclear whether certain job functions or specific workplace activities, including care for individuals with known and unknown SARS-CoV-2 positivity, increase the risk of SARS-CoV-2 infection among HCP. 2. HCP serum was collected from a large multi-state study associated with the CDC to determine the prevalence of antibodies to SARS-CoV-2. 3. This study sought to identify risk factors associated with seropositivity, including HCP demographic characteristics, work location, work exposure to patients with COVID-19, and community exposure to COVID-19.

**Findings:** 1. 24,749 HCP participated: <50 years of age, 69.6%; women, 78.2%; White individuals, 61.2%; non-Hispanic individuals, 90.5%; Black persons, 20.7%; employment in acute care hospitals, 87.1%; nurse was the most common job role, 31.6%. 2. Seropositivity for SARS-CoV-2 was 4.4% (1080 HCP) overall and did not differ substantially by site. 3. There was no clear association between workplace contact with patients with COVID-19 and antibody positivity. 4. For HCP, the risk of SARS-CoV-2 infection from community exposures may exceed the risk from patient exposures.

“Importantly, these findings suggest that current infection control measures are effective for preventing SARS-CoV-2 transmission when working with patients, and HCP risk of infection may be driven by community and nonpatient care occupational exposures. Prioritizing efforts to practice optimal infection prevention in all health care facilities remains critical to keeping HCP and patients safe and may need to include assessments comparing transmission from patient-to-HCP and between HCP.”

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