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Commentary

A new group at increased risk of a SARS-CoV-2 infection emerges: The recently vaccinated



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On December 27th, 2020, the first doses of an approved Covid-19 vaccine arrived in Frankfurt, Germany. First in line to receive a vaccination, and among the first in Germany altogether, were health care workers (HCWs) at the University Hospital Frankfurt. They had been designated a high priority to become vaccinated, either because of high occupational risk of becoming infected, or close contact to particularly vulnerable patients [1]. Vaccination has been eagerly awaited by many, and the arrival of the first doses of a Covid-19 vaccine welcomed as a relief from worries to become severely ill and to also reduce the risk of transmitting the virus onward to vulnerable patients. The first vaccine that was available to the health care workers was Comirnaty® by BioNTech/Pfizer. In the phase 3 trial, the efficacy of this vaccine in preventing a symptomatic SARS-CoV-2 infection with onset at least 7 days after the second dose has been demonstrated to be an astonishing 95%, justifying a sigh of relief among the newly vaccinated.

But in the days following the start of the vaccination campaign, a new development became evident: Several of the recently vaccinated HCWs developed symptoms of Covid-19, and an infection with SARS-CoV-2 was confirmed by PCR. Of the 1306 HCWs who had received a first dose of the vaccine by January 18th, 2021, seven HCWs tested positive. A symptomatic infection was confirmed on day two, four, seven, eleven, sixteen, seventeen and nineteen after receiving the first dose, respectively. The recently vaccinated made up 35% of the total number of the 20 employees of the University Hospital who tested positive in that time period, meaning the recently vaccinated were overrepresented among those with a symptomatic infection. Of those who had been inoculated and later tested positive, some may have already been in the incubation period when receiving the vaccine, but others likely became infected shortly after receiving the first dose.

And indeed, it is not at all surprising that symptomatic Covid-19 may develop shortly after receiving the first dose, and this does not indicate failure of the immune response to the vaccine. In the phase 3 trial of Comirnaty®, partial protective effects were observed starting 12 days after the first dose. Between the two doses, vaccination is believed to be about 52% effective in preventing symptomatic disease [2].

A likely explanation for the high rate of Covid-19 among the recent vaccinees is an individual overestimation of the protective effect that occurs shortly after receiving the first dose. Weary from a year into the pandemic, the recently vaccinated HCWs may have exhibited a less defensive behavior towards becoming infected after the first dose, falsely assuming they are already protected. For example, they may have been less vigilant when meeting on breaks in the hospital [3] or when socializing outside of the work environment. This may have led not only to an overall increased individual risk of symptomatic Covid-19 in these HCWs, but also to an increased risk of onward transmissions.

The cycle threshold (Ct-)values observed in six out of the seven recent vaccinees with confirmed Covid-19 were 22.4–24.9 (Roche cobas SARS-CoV-2 assay, target: ORF-region; Roche diagnostics, Basel, Switzerland) and 18.9 (Xpert Xpress® SARS-CoV-2/Flu/RSV assay; Cepheid, Sunnyvale, USA), values that correlate with in-vitro infectivity [4].

These recent observations in our University Hospital indicate that in vaccination campaigns against Covid-19, the recipients of the vaccines approved in the European Union today must be urged to keep vigilant and uphold a defensive behavior towards both becoming infected and transmitting an infection onward. This is particularly important for HCWs.

Making all members of the public aware that full protection will not be in effect until after the vaccination schedule of the administered Covid-19 vaccine has been completed is also essential to prevent public doubts about these vaccines extremely high efficacy, to combat novel “variants of concern” [5] and therefore to unveil their full potential in preventing deaths, and ending the pandemic.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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