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Using a qualitative test to assess COVID-19 severity and long-term persistence of anti-SARS-CoV-2 nucleocapsid IgG antibodies

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Anti-SARS-CoV-2 nucleocapsid IgG antibodies (anti-N IgG) are important for activating antibody-dependent cellular cytotoxicity. Implementing the N-protein in future vaccines could be beneficial. Anti-N IgG sample/cut-off indices (S/C) were measured by using the SARS-CoV-2 IgG qualitative test on the Abbott Architect ci4100. The influence of multiple factors on anti-N IgG serostatus was evaluated including gender, age, disease duration, disease severity, smoking status and vaccination status. Gender did not affect anti-N IgG S/C values (p=0.513) and they correlated positively with age (r=0.07; p=0.321). There was a negative correlation between anti-N S/C IgG and disease duration (r=-0.02; p=0.751) and between anti-N S/C and months post-recovery (r=-0.13; p=0.101). Smokers had a significant negative correlation between anti-N S/C IgG and months post-recovery (r=-0.39; p=0.003). Participants with severe disease had the highest mean (5.29 S/C ± 3.33, 95% CI: 3.69-6.89, IQR=5.8), followed by moderate (5.17 S/C ± 2.77, 95% CI: 4.43-5.91, IQR=4.5) and mild disease (4.95 S/C ± 2.78, 95% CI: 4.06-5.83, IQR=3.9). Asymptomatic participants had the lowest mean (4.86 S/C ± 2.67, 95% CI: 4.05-5.66, IQR=3.5). No significant difference was measured between vaccinated and unvaccinated participants (p=0.091), since vaccines contain spike protein only. A significant difference was measured when comparing disease severity and different vaccines ($\chi 2$=48.567, p=0.002). BNT162b2 was more prevalent in asymptomatic and mild forms of disease with an anti-N S/C mean (2.04 S/C ± 2.76, 95% CI: 1.57-2.51, IQR=3.4), whereas BIBBP-CorV was more prevalent in severe disease resulting in a higher mean (3.36 S/C ± 3.31, 95% CI: 2.27-4.45, IQR=4.3). Disease severity can be predicted by using a qualitative test. Non-smokers sustained seropositivity longer than smokers. Participants vaccinated with BNT162b2 had lower anti-N IgG S/C values possibly due to more robust protection compared to other vaccines.

Biography

Suad Meshikj graduated from the Faculty of Medicine at University Ss. Cyril and Methodius Skopje in 2018 at the age of 24. Currently he specializes in medical biochemistry at the Institute for Medical and Experimental Biochemistry, Skopje and works in NIKOB Lab, a private laboratory in Skopje.

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