Serum neutralizing activity against SARS-CoV-2 variants in hospitalized COVID-19 patients

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Background:
The recent spreading of new SARS-CoV-2 variants, carrying several mutations in the spike protein, could impact on immune protection elicited by natural infection or conferred by vaccination. This study aimed at evaluating the neutralizing activity against the viral variants emerged in the United Kingdom (B.1.1.7), Brazil (B.1.1.28.1), and South Africa (B.1.351) in human serum samples from hospitalized patients infected by SARS-CoV-2 during the first pandemic wave in Italy in 2020.

Methods:
Serum samples of 42 COVID-19 patients hospitalized in Italy between March and May 2020, were included in the present study. Samples available for each patient at three time points were selected: hospital admission sample, sample showing the highest neutralizing antibody titre against 2019-nCoV/Italy-INM11 strain (Wuhan strain), and the last sample available during hospital stay. Samples were tested for SARS-CoV-2 neutralizing antibody against B.1.1.7, B.1.1.28.1, and B.1.351 wild type viruses by micro-neutralization assay.

Results:
The decrease of neutralizing antibody titre for all three variants was statistically significant at any time point. At discharge/decease, 59.5% of patients showed a decrease ($\geq$2 fold) in neutralizing antibody titre against the B.1.1.7 variant, 83.3% against the B.1.1.28.1 variant, and 90.5% against the B.1.351 variant with respect to the original strain.
Conclusions:
The reduction of neutralizing antibody titres against all analysed variants, and in particular B.1.1.28.1 and B.1.351 ones, suggests that previous symptomatic infection might be not fully protective to exposure of SARS-CoV-2 variants carrying a set of relevant spike mutations.

Key messages:
- A reduction in neutralizing antibody titres against B.1.1.7, B.1.351, and B.1.1.28.1 variants was observed.
- Previous symptomatic infection might be not fully protective to exposure of SARS-CoV-2 variants carrying a set of relevant spike mutations.