Serological response to SARS-CoV-2 messanger RNA vaccines in Italian adult population: first results of a prospective study

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Background: Preventive vaccination is the safest and most cost-effective way to prevent COVID-19 illness and death. The BNT162b2 mRNA vaccine have been shown to induce anti-spike (S) protein-specific antibodies (anti-S). Antibodies developed after vaccination seem to correlate with a certain grade of protection and prevention of viral activity. Study aims to investigate, through serological analysis, the extent of the BNT162b2 vaccine induced antibodies against SARS-CoV-2 in a large cohort of Italian subjects belonging to the early vaccinated cohort in Italy.

Methods: A prospective study was conducted between December 2020 and May 2021 at the COVID-19 vaccination center of the Teaching Hospital of the University of Catanzaro. Study subjects included those identified as priorities by the Italian Minister of Health and teaching and administrative University staff. Three blood samples were collected for each participant: at the time of the first vaccine dose (T0), at the time of the second vaccine dose, (T1) and after 30 days from this last dose (T2).

Results: We enrolled 2,591 subjects fully vaccinated; 16.5% were fail subjects and 9.8% over 80 years aged. Overall, 2,541/2,591 (98.1%) subjects were seropositive when tested at T2;1,939/2,541 (76.3%) developed an IgG anti-S titer $\geq$4,160 AU/mL, adequate to develop viral neutralizing antibodies.

Conclusions: In summary, vaccination leads to detectable IgG anti-S titer in nearly all vaccine recipients. Some caution is required with interpretation of antibody results and any subsequent behaviour change and large-scale studies will be required to assess how protection from infection varies by antibody titre.