Rapid Reduction of Anti-SARS-CoV-2 Antibodies after Mild Illness

Journal Article, Correspondence
Ibarrando FJ, Fulcher JA, Goodman-Meza D, et al. Rapid Decay of Anti-SARS-CoV-2 Antibodies in Persons with Mild Covid-19. N Engl J Med online publication ahead of print 21st July 2020
doi: 10.1056/NEJMc2025179

Summary

Methods

- The study was conducted at School of Medicine, University of California, Los Angeles
- After screening 41 willing patients who had recovered after a mild COVID-19 infection, 34 were studied.
- Infection had been confirmed by RT-PCR assay in 30 of 34 participants. The other 4 were close contacts of COVID-19 patients, and had symptoms compatible with COVID-19
- Two participants received low flow supplemental oxygen and leronlimab (a CCR-5 antagonist), but not remdesivir
- Blood samples were analysed by ELISA to detect anti-SARS-CoV-2 spike receptor binding domain IgG and further modified to quantify antibodies using control anti-receptor-binding domain monoclonal IgG

Results:

- There were 20 women and 14 men with mean age of 43 years (21-68)
- 31 of 34 participants had two serial measurements of IgG levels and the remaining 3 participants had 3 serial measurements. The first measurement was at a mean of 37 days (18-65) after the onset of symptoms and the last measurement was at a mean of 86 days (44-119).
- The initial mean IgG level was 3.48 $\log_{10}$ ng/ml (2.52-4-41).
- On the basis of a linear regression model that included the participant's age and sex, the days from symptom onset to the first measurement, the estimated change (slope) was 0.0083 $\log_{10}$ ng/ml (0.0352-0.0062)
- This corresponds to a half-life of 73 days over the observation period (95% CI 52-120)

Conclusion:

- Humoral immunity may not be long lasting in persons with mild disease who comprise the majority of persons with COVID-19

Appraisal:

- Strength
  - First study characterising the temporal course of antibody response to COVID-19.
- Weakness
  - Relatively small number of cases
  - Temporal profile of antibody decline cannot be predicted with certainty after 90 days, since the study duration was short. It is possible that the decay may decelerate.
  - Temporal profile in patients with severe infections may be different, and needs to be studied.

Opinion:

This study corroborates the earlier study by Long et al. in the Chinese population (doi: 10.1038/s41591-020-0965-6), which demonstrated that 40% of asymptomatic patients were seronegative for IgG at 8 weeks. The decline in protective antibody titre is quicker than that reported for SARS-CoV-1. Hence 'immunity passport' for infected COVID-19 patients is questionable. Also, duration of vaccine efficacy is a matter of concern and will have to be assessed meticulously; and addressed accordingly.

Appraisers

Dipankar Bhowmik, Megha Brijwal and Animesh Ray, Departments of Nephrology, Microbiology and Medicine, All India Institute of Medical Sciences, New Delhi.