A dual antigen-antibody test from a nasopharyngeal sample is a new tool for the clinical evaluation of SARS-CoV-2

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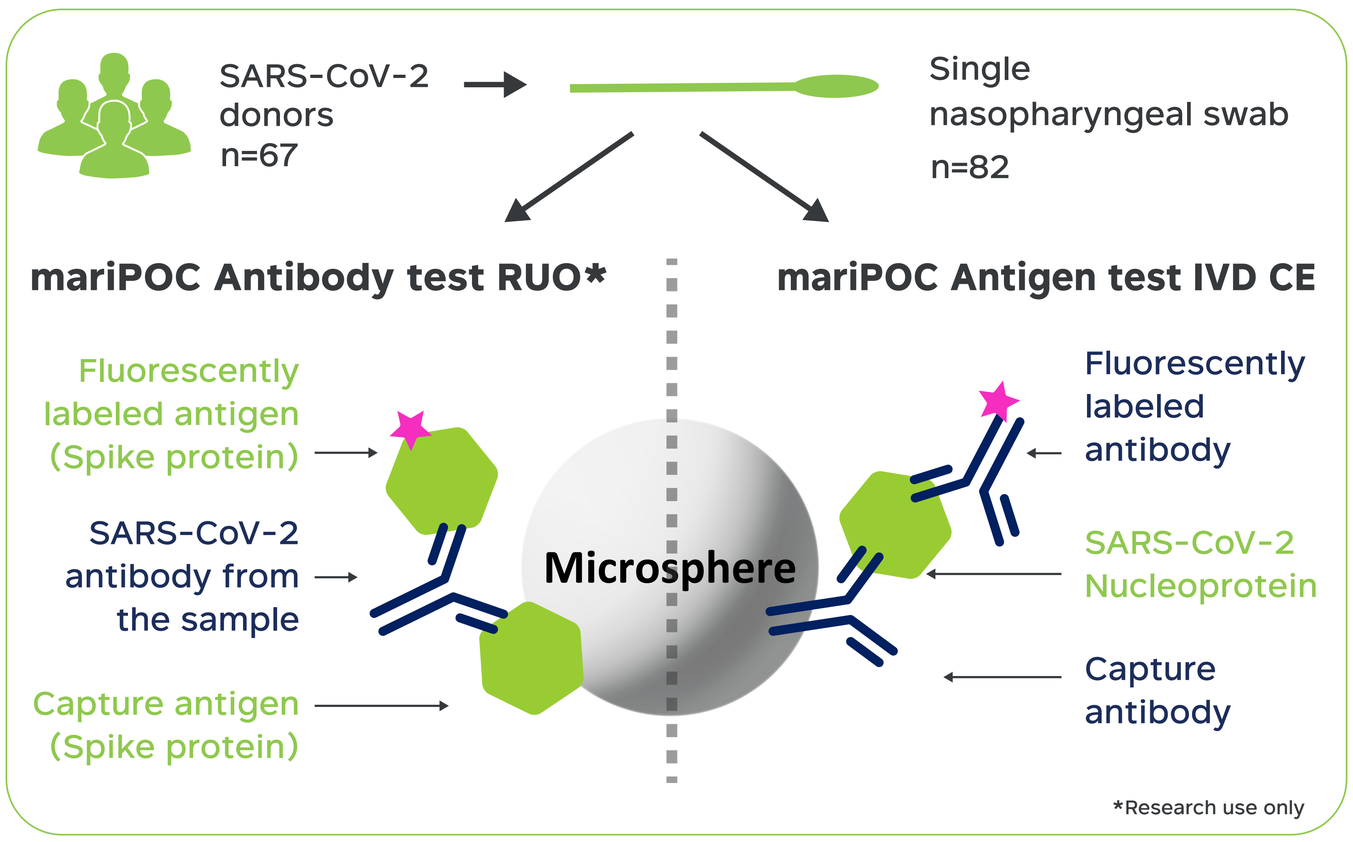
Introduction

Appropriate COVID-19 infection control relies on both accurate diagnosis and prediction of an individual's infectivity, as well as correctly timed patient isolation. Contagiousness can be easily assessed through SARS-CoV-2 antigen tests. This is thanks to the very high correlation between rapid antigen and viral culture test results. The aim of this study was to preliminary evaluate whether the negative predictive value of rapid testing for contagiousness could be further improved by the detection of SARS-CoV-2 antibodies from the same nasopharyngeal swab.

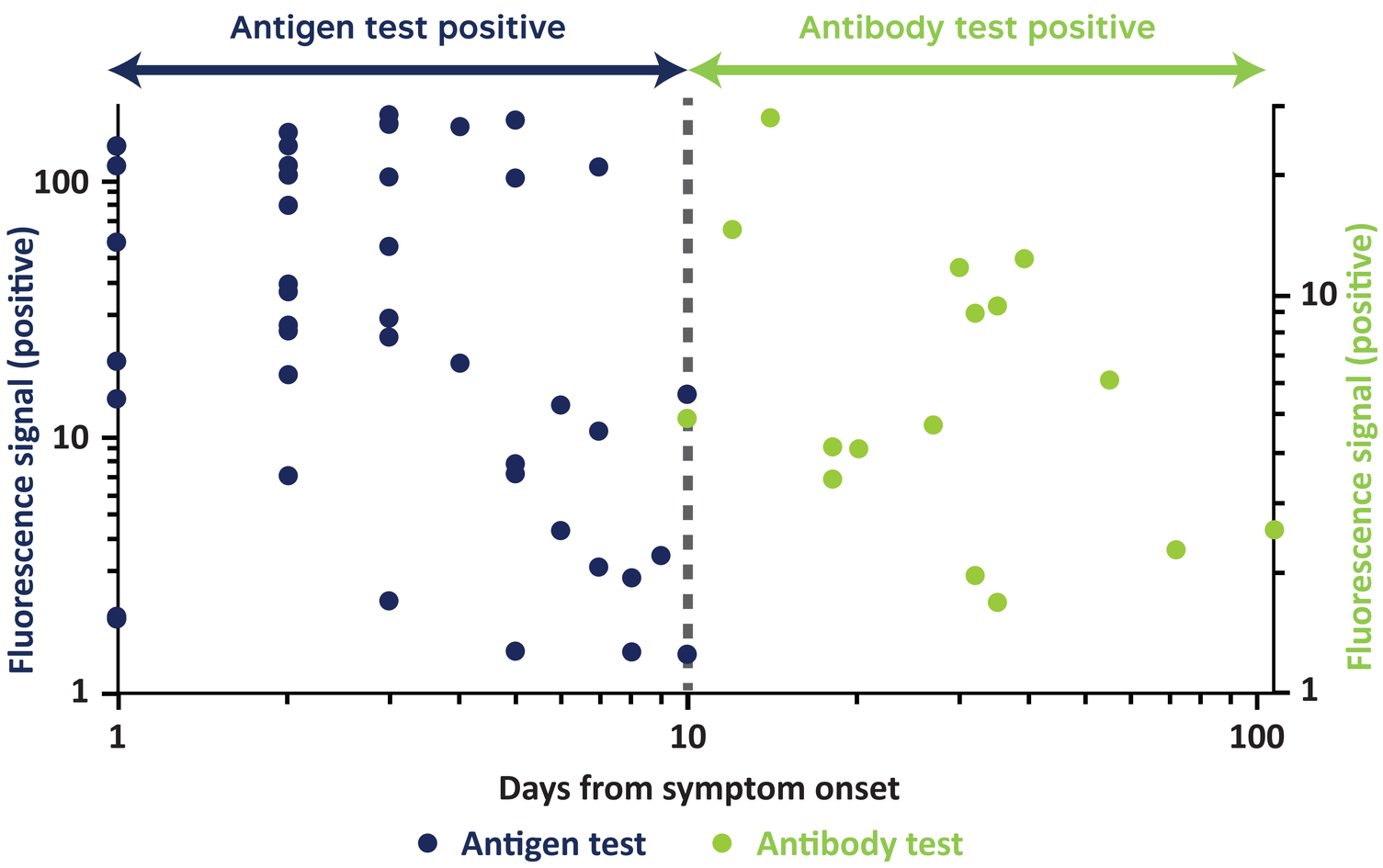
Materials and methods

Nasopharyngeal swab samples (N=82) were collected from voluntary donors (N=67) infected with SARS-CoV-2, ranging from 0 to 107 days from symptom onset. The samples were tested with mariPOC SARS-CoV-2 antigen test and a prototype mariPOC SARS-CoV-2 antibody test, which is based on the antibody bridging[1] principle and the use of SARS-CoV-2 spike protein for solid phase capture and fluorescent detection.



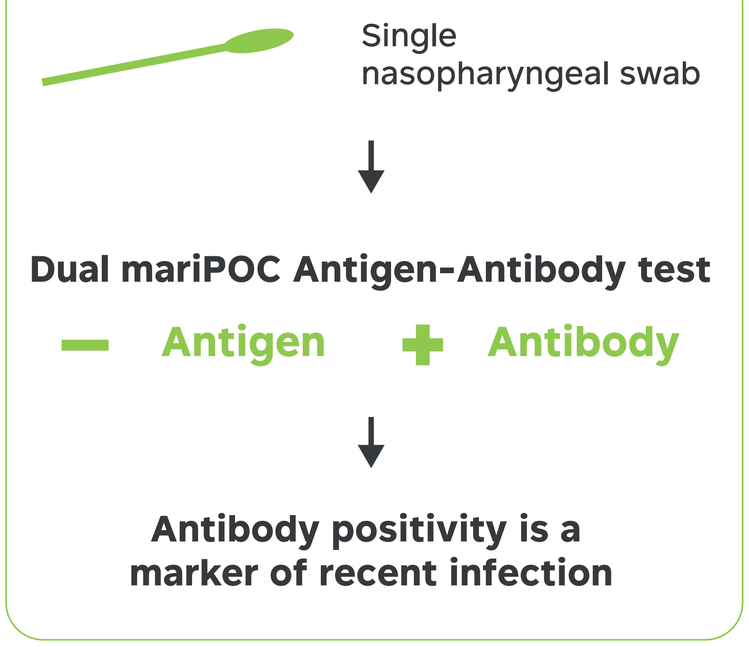
Results

Figure shows that samples collected between 0 and 10 days from symptom onset were positive only for SARS-CoV-2 antigen and negative for SARS-CoV-2 antibody test, while the samples collected after 10 days were negative for SARS-CoV-2 antigen and positive only for SARS-CoV-2 antibody test.



Conclusion

It is known that the nasopharyngeal secretion of antibodies is transient and ceases approximately two months after the onset of infection. A decrease in antigen levels correlates with an increase in antibody levels in the nasopharynx. Detecting antibodies in the absence of antigen positivity is a marker of recent infection and can be expected to increase the negative predictive value of rapid testing in ruling out infectivity.



Clinical insight

Dual antigen-antibody testing enables to obtain exact diagnosis in the acute phase, yet providing additional serological information in assessment of prolonged symptoms.

- Evaluation of the need for sickness leave
- Differential diagnosis in asthma like and long COVID symptoms
- Prognosis and need of follow ups for respiratory symptoms

[1] Smolander, H. (2010). A novel antibody avidity methodology for rapid point-of-care serological diagnosis. Journal of Virological Methods, 166(1–2), 86-91. ISSN 0166-0934.