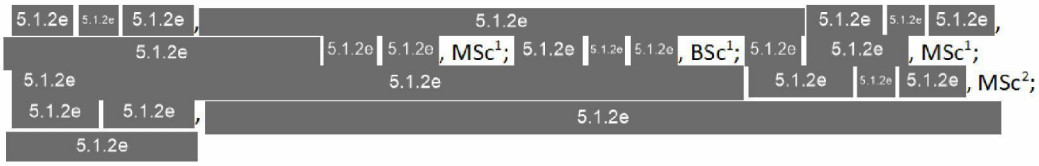
Persistence and maturation of IgG antibodies in the first seven months following infection with SARS-CoV-2 in a prospective nationwide study



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ABSTRACT

Background

The longevity of immunity following infection with SARS-CoV-2 is a major concern globally. Several studies report on a relative short period of circulating specific serum antibodies. Here, we study the concentrations of IgM, IgA and IgG-specific SARS-CoV-2 antibodies in seroconverted participants up to 7 months following onset of symptoms.

Methods

Longitudinal blood samples from seroconverted participants (N=353) in the prospective, nationwide ***Pienter-Corona study***, were collected. Per seroconverted participant, two to three consecutive serum samples were analysed for IgG, IgA and IgM antibody levels to SARS-CoV-2 Spike S1 and strength of antibody binding (avidity) in relation to the time since onset of disease symptoms.

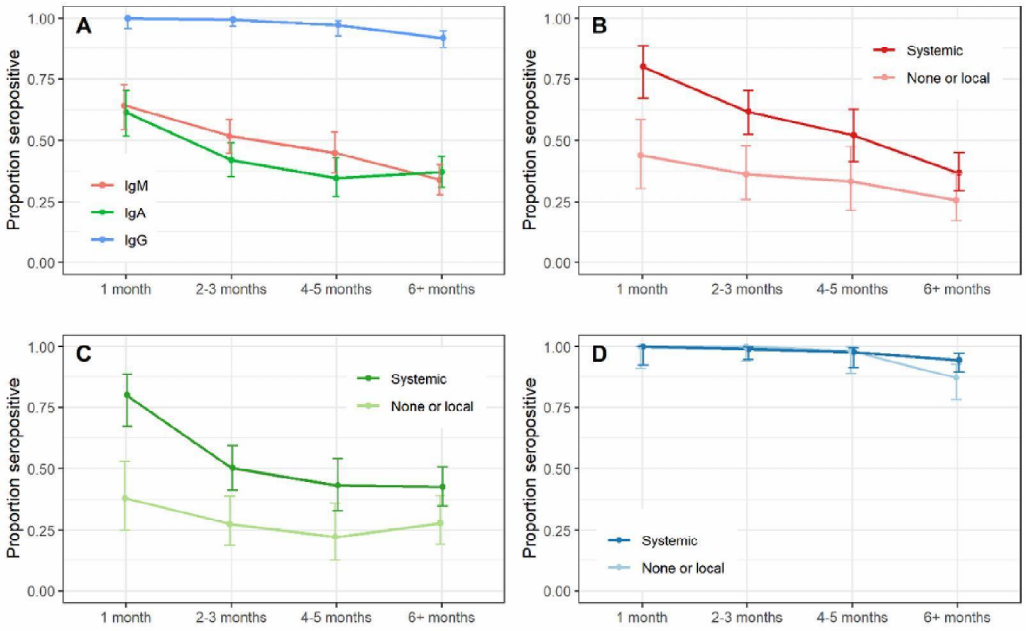
Results

While SARS-CoV-2-specific IgA and IgM antibodies were detected following infection, these declined after the first month post onset of disease. In contrast, specific IgG was still detected in 92% of the participants after 6-7 months. The half-life of IgG antibodies was 163 days and concentrations remained higher in symptomatic persons. Moreover, the avidity of IgG antibodies doubled over time.

Conclusions

SARS-CoV-2-specific IgA and IgM antibodies wane within a few months whereas ***IgG persisted*** and showed increasing avidity over time, indicative of higher functionality and an underlying maturation of cellular immunity. These data help explain the previous different estimates of the duration of SARS-CoV-2-specific antibodies in various studies and point towards the presence of a ***memory against SARS-CoV-2***.

Trial registration number: NL8473



The seroprevalence for SARS-CoV-2 antibodies in relation to time since onset of symptoms. A) *The proportion of individuals with IgM, IgA and IgG antibodies.* ***B)*** *The proportion of persons with IgM antibodies depending on having symptoms (Systemic) or not (None or local).* ***C and D)*** *data as in B for IgA (C) and IgG (D). Data show that symptomatic persons more frequently have antibodies to SARS-CoV-2, also half a year after contraction of the virus. And that almost all persons still have IgG antibodies after more than half a year since onset of symptoms.*