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Antibodies to SARS-CoV-2 Are Detected up to Three Months after Infection, According to a Study Among Health Care Workers

The follow-up study in health care workers of the Hospital Clinic de Barcelona hopes to provide information on the duration of different antibodies to SARS-CoV-2 and their role in protecting from disease and reinfection

Barcelona, 20 November 2020- A new study in health care workers led by the Barcelona Institute for Global Health ([ISGlobal](#)), an institution supported by “la Caixa” Foundation and the Hospital Clínic of Barcelona, shows that **IgA and IgM antibodies to SARS-CoV-2 decay quickly, while IgG antibody levels are maintained for at least three months after infection**¹. The longer follow-up of this cohort will provide much-needed information on the duration of different types of antibodies to SARS-CoV-2, the virus that causes COVID-19, as well as their role in protecting from disease and reinfection.

Since the start of the COVID-19 pandemic, there have been two burning questions: how many people have really been infected, and whether infected people are protected from future reinfections or disease. ISGlobal researchers Carlota Dobaño and Alberto García-Basteiro joined forces to help answer these questions with the [SEROCOv1](#) study, which intends to **follow-up a cohort of over 550 health care workers at the Hospital Clínic of Barcelona**.

The team [showed](#) that, at the peak of the COVID-19 pandemic in Spain, the prevalence of SARS-CoV-2 infection among health care workers was 11.2% (9.2% had antibodies and 2% had active infection detected by PCR). This was slightly higher than the antibody prevalence among the general population in Barcelona (7%), estimated by a [national seroprevalence study](#) performed shortly after.

In this new study, researchers from ISGlobal and Hospital Clínic present **data after 3 months of follow-up of the same cohort of health care workers**. As in the first study, an immune [assay based on the Luminex technology developed by Dobaño’s team was used](#) to measure three main types of antibodies (IgM, IgG and IgA) directed against the receptor binding domain (RBD) of the SARS-CoV-2 *Spike* protein, which allows it to infect human cells.

The results show that, **one month after the initial seroprevalence assessment** conducted at the beginning of April 2020, the percentage of participants with evidence of previous or current infection had increased to 15% and that around 60% of the new infections detected were asymptomatic. “In one month, we found 25 new infections among the participants, which is quite high, considering that the peak of the pandemic had passed and the population had been confined for more than one month,” says **García-Basteiro**, who is also a medical doctor at the International Health Service of Hospital Clínic.

¹ IgA antibodies are associated to mucous membranes, for example those lining our nose. IgMs are the first antibodies produced by our body when fighting a new infection. IgGs are the most abundant antibodies and those that protect us the best from viruses and bacteria, since they have a higher affinity than IgMs.

Of the 82 seropositive participants detected at month 1, 66 were followed up for an additional two months. **By month three**, most (78%) had no longer detectable levels of IgM, some (24.5%) had no longer detectable IgA, but the majority (97%) maintained detectable levels of IgG. In fact, IgG levels in some of the participants increased as compared to the first analysis. Symptomatic cases had higher levels of IgA but no differences in the speed at which antibodies declined were observed between asymptomatic and symptomatic infections. Overall, IgG1 levels were higher, although high IgG2 levels correlated with a longer duration of symptoms.

“Our findings confirm that IgM and IgA antibodies rapidly decline within the first month or two after infection, which should be kept in mind when performing seroprevalence studies or interpreting serological results” says **Gemma Moncunill**, first author of the study. “While the duration of detectable IgG antibodies following infection is still unknown, our results show that they remain relatively stable for at least three months,” she adds. The SEROCOV1 team (which includes researchers from several ISGlobal’s programs and from the departments of Occupational Health, Preventive Medicine and International Health at Hospital Clínic) plans to follow-up this cohort for a longer time, in order to assess the evolution of the seroprevalence in this high risk group, the duration of detectable antibodies, including several isotypes and subclasses to several antigens, and their role in protecting from disease and reinfection.

An extremely powerful assay to measure SARS-CoV-2 antibodies

In fact, Dobaño’s team has recently developed and [published](#) a multiplex assay for simultaneously measuring IgM, IgA and IgG to a panel of eight different viral fragments (antigens) from SARS-CoV-2 spike (S), nucleoprotein (N) and membrane (M) proteins. The assays show a specificity of 100% and a sensitivity of over 95%, and have been optimized to minimize processing time. By combining multiple markers, these assays can detect a wider range of low-level antibody responses in the population. “In addition to better assessing SARS-CoV-2 immunity in the population, these assays can be of great value for evaluating markers of protection when testing COVID-19 vaccines,” says **Dobaño**.

Reference

Moncunill G, Mayor A, Santano R et al. [SARS-CoV-2 seroprevalence and antibody kinetics among health care workers in a Spanish hospital after three months follow-up](#). *Journal of Infectious Diseases*. 2020. doi: 10.1093/infdis/jiaa696.

Dobaño C, Vidal M, Santano R et al. [Highly sensitive and specific multiplex antibody assays to quantify immunoglobulins M, A and G against SARS-CoV-2 antigens](#). *J Clin Microbiol*. 2020 Oct 30; doi: 10.1128/JCM.01731-20.

About ISGlobal


The Barcelona Institute for Global Health, ISGlobal, is the fruit of an innovative alliance between the “la Caixa” Foundation and academic and government institutions to contribute to the efforts undertaken by the international community to address the challenges in global health. ISGlobal is a consolidated hub of excellence in research that has grown out of work first started in the world of health care by the Hospital Clínic and the Parc de Salut MAR and in the academic sphere by the University of Barcelona and Pompeu Fabra University. The pivotal mechanism of its work model is the transfer of knowledge generated by scientific research to practice, a task undertaken by the institute’s Education and Policy and Global Development departments. ISGlobal has been named a Severo Ochoa Centre of Excellence and is a member of the CERCA programme of the Generalitat de Catalunya.

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