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Measuring antibodies in saliva is a useful and easy strategy to detect SARS-CoV-2 infections

The study results from a collaboration between ISGlobal and Hospital SJD, and tested over 1,500 children in Barcelona during the summer of 2020

Barcelona, November 25, 2021-. Saliva samples are easy to obtain and useful for **measuring antibodies to SARS-CoV-2 in children**, which could facilitate epidemiological surveillance in school settings. The study, a collaboration between the Barcelona Institute for Global Health (ISGlobal), an institution supported by "la Caixa" Foundation, and the Hospital Sant Joan de Déu (HSJD), followed over **1,500 children** who last year attended **summer schools in Barcelona**. The results were published in BMC Medicine.

One of the pressing questions during this pandemic has been **understanding children's susceptibility to SARS-CoV-2 infection and their capacity to infect others**. An obstacle to answer this question is that most infections in children are mild or asymptomatic, and are therefore missed. To establish whether an individual has been exposed to SARS-CoV-2 in the past, one needs to look for virus-specific antibodies in blood. Measuring the prevalence of antibodies over time in a cohort of children can provide very valuable epidemiological information. However, this requires techniques that are sensitive (capable of detecting low antibody levels) and minimally invasive (so they can be done frequently).

In this **study**, performed through the Kids Corona platform, the team led by **Carlota Dobaño**, from ISGlobal, and **Iolanda Jordan**, from HSJD, **used saliva instead of blood to measure virus-specific antibodies** in over 1,500 children who attended different summer schools in Barcelona in 2020, as well as around 400 adult staff. Two saliva samples per participant were analysed, one at the beginning and one at the end of the camp stay, and different antibody types (IgG, IgA and IgM) targeting different viral antigens were measured.

The results show that **3.2% of the summer school participants developed antibodies between the first and second sample**, which is indicative of new infections. This is **6 times higher than the infection rate estimated by weekly PCR screening**. "It has been reported that some **children** can be positive for antibodies despite being negative by PCR, which suggests that they **can generate an immune response that prevents the establishment of SARS-CoV-2 infection,"** explains **Dobaño**, first author of the study. It can also be due to the fact that asymptomatic children have lower viral loads or that they clear the virus faster.

In addition, the analysis shows that the **percentage of new infections was higher in adults (2.94%) than in children (1.3%)**, which suggests differences in infection and transmission dynamics. Finally, contrary to what has been observed in blood, asymptomatic people had higher levels of anti-Spike antibodies in saliva, suggesting these antibodies play a protective role in respiratory mucosae. "This means that **anti-Spike antibodies in saliva could be used to measure protective immunity upon vaccination**, especially in the case of intranasal vaccines," says **Gemma Moncunill**, senior coauthor of the study.

"We previously demonstrated in other Kids Corona studies **that saliva is useful for detecting virus by PCR**. With this study, we demonstrate that **it's also an effective and much friendlier**

way to measure antibodies, making it the ideal sample for children, instead of the more invasive nasal swab," says **Jordan**.

"Studies using saliva are much easier to perform and do not require specialized staff for its collection," says **Juan José García**, Chief of Pediatrics at HSJD and coordinator of the Kids Corona study, which means this strategy could prove very useful to measure the incidence in school settings and guide decisions on the kind of measures that need to be implemented.

Reference:

Dobaño C, Alonso S, Fernández de Sevilla M, et al. Antibody Conversion rates to SARS-CoV-2 in Saliva from Children Attending Summer Schools in Barcelona, Spain. BMC Medicine. 2021.

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. Its working model is based on the generation of scientific knowledge through Research Programmes and Groups, and its translation through the areas of Training and Analysis and Global Development. ISGlobal has been named a Severo Ochoa Centre of Excellence and is a member of the CERCA system of the Generalitat de Catalunya.

About Hospital Sant Joan de Déu Barcelona

Sant Joan de Déu-Barcelona Children's Hospital (SJD) is a university hospital specializing in maternal, child and adolescent health care. Founded in 1867, SJD belongs to the Hospitaller Order of Saint John of God and is a private, non-profit institution that has been integrated in the public network of the Spanish national health system since 1973. SJD is the largest children's hospital in Spain and is one of the most recognized of its category across Europe. The hospital is accredited by the Spanish Ministry of Health as a reference centre for all Spain in a wide range of specialties such as Onco-haematology, Cardiology and Cardiac Surgery, Orthopedics, Neurosciences, Genetics, Rare Diseases, Ophthalmology and Reconstructive Surgery to name a few. The hospital is also accredited by the European Commission in 14 European Reference Networks for specialized care in rare diseases.

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