Seroprevalence of Anti-SARS-CoV-2 Antibodies Three Months Post Infection in Healthcare Professionals at an Oncology Hospital in Northern Portugal

Seroprevalência de Anticorpos Anti-SARS-CoV-2 Três Meses Após Infeção em Profissionais de Saúde

Keywords: Antibodies, Viral/blood; COVID-19; Immunoglobulin G; Immunoglobulin M; SARS-CoV-2
Palavras-chave: Anticorpos Antivirais/sangue; COVID-19; Imunoglobulina G; Imunoglobulina M; SARS-CoV-2

To the Editor:

In the context of the COVID-19 pandemic we performed an immunologic study in healthcare professionals to assess antibody prevalence after SARS-CoV-2 infection. Our data appears relevant because approximately two thirds of individuals tested had no detectable antibodies three months after symptom onset, and therefore remained susceptible to COVID-19, which goes against the Portuguese Directorate-General of Health, which considers that that vaccination should be withheld in individuals with previous infection.[1]

Studying the host's immune response to SARS-CoV-2 infection with serological tests is important to assess if infected individuals develop any functional immune response capable of protecting against additional SARS-CoV-2 infections, thus reducing transmission.[2] This matters because there are confirmed cases of reinfection.[3] In non-human primates, even low levels of antibody titres were associated with protection against COVID-19,[4] meaning that measuring antibodies and understanding how the titres evolve over time in the human species is of great importance in dealing with the pandemic.

We evaluated the serological response following COVID-19 three months after onset of symptoms in healthcare professionals that were infected with SARS-CoV-2 to find evidence of potential protective immunity. We used samples from 37 healthcare professionals from our institution that had COVID-19. They all had minor symptoms, and no one was hospitalized. Informed consent was obtained from all participants.

Infections were initially confirmed by real-time RT-PCR on blood samples collected three months after symptom onset which were analysed by enzyme-linked immunosorbent assay using the Meditecno® Gemini with NovaLisa® kits to detect IgG and IgM antibodies against SARS-CoV-2 antigens. Results were given in NovaTec Units, with a positive cut-off above 11 NTU.

IgG levels were only measurable in 14 cases (37.8%), with a mean of 17.54 NTU (ranging from 12.9 NTU to 26.6 NTU). As IgM is a marker of recent infection, its levels were, as expected, unmeasurable in all cases (Table 1).

Understanding the natural course of this infection can be an important step in controlling the pandemic. Assuming that the presence of IgG antibodies can be associated with immunity, the 37.8% seroprevalence estimate of IgG at three months, reflected in our results, suggests most of the mildly infected population may remain susceptible to COVID-19. However, the exact duration of detectable antibodies is still uncertain. A rapid decay of anti-SARS-CoV-2 IgG in early infection is seen in patients with mild illness,[5]

Table 1 – Subjects of the study and serologic test results

n	Gender	IgM	IgG (NTU)	n	Gender	IgM	IgG (NTU)
1	F	Neg	Neg	**20**	F	Neg	Neg
2	F	Neg	Neg	**21**	F	Neg	Neg
3	F	Neg	Neg	**22**	F	Neg	Neg
4	F	Neg	**Pos (19.5)**	**23**	F	Neg	Neg
5	F	Neg	Neg	**24**	F	Neg	**Pos (18.0)**
6	F	Neg	Neg	**25**	F	Neg	Neg
7	F	Neg	Neg	**26**	F	Neg	**Pos (14.4)**
8	F	Neg	Neg	**27**	F	Neg	**Pos (14.6)**
9	F	Neg	**Pos (15.4)**	**28**	F	Neg	**Pos (16.8)**
10	F	Neg	Neg	**29**	F	Neg	Neg
11	F	Neg	**Pos (13.2)**	**30**	F	Neg	**Pos (13.7)**
12	F	Neg	**Pos (12,9)**	**31**	F	Neg	Neg
13	F	Neg	Neg	**32**	F	Neg	**Pos (25.7)**
14	F	Neg	**Pos (26.6)**	**33**	F	Neg	**Pos (14.3)**
15	F	Neg	**Pos (16.1)**	**34**	F	Neg	Neg
16	F	Neg	Neg	**35**	M	Neg	Neg
17	F	Neg	Neg	**36**	M	Neg	**Pos (24.4)**
18	F	Neg	Neg	**37**	M	Neg	Neg
19	F	Neg	Neg				

Neg: negative; Pos: positive

which can partially explain our findings. However, there is evidence that subjects with asymptomatic, mild, moderate and severe COVID-19 had a seroprevalence of IgG close to 98% one-month post symptom onset and at six to eight months the percentage only dropped to 90%,[4] meaning that longer observation periods should be considered in future studies in order to determine how the antibody titres evolve and how they may influence protective immunity. With the rollout of COVID-19 vaccines, studies can be carried out to assess the influence of protective immunity in reinfection and antibody production thus making the research window for this matter wider.

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Recebido: 06 de abril de 2021 - **Aceite:** 07 de abril de 2021 - ***Online issue published*:** 01 de junho de 2021

https://doi.org/10.20344/amp.16336