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Letter to the Editor

Qualitative serology in patients recovered from SARS CoV 2 infection

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Lee YL et al in this journal recently reports the Dynamics of anti-SARS-Cov-2 IgM and IgG antibodies among COVID-19 patients.[1] In this study authors performed an anti-SARS-CoV-2 IgG/IgM test on 14 confirmed COVID-19 patients and 28 negative controls. Antibody response varied with different clinical manifestations and disease severity. and development of anti-SARS-CoV-2 IgM antibodies had a shorter duration of positive RT-PCR result and no worsening clinical conditions compared to those without the presence of anti-SARS-CoV-2 IgM antibodies.

Previous studies have evaluated the possible role of a quick detection approach targeting viral IgM or IgG antibody using different methods. Results have been conflicting with respect to the sensitivity of this approach. Thus, antibody determination is not advocate for SARS-CoV 2 infection diagnosis.[2–4]

The knowledge of antibody's significance and frequency in patients cured of SARS CoV 2 is extremely limited. We aimed to evaluate the frequency of antibodies generated against SARS CoV 2 in patients cured of the infection.

We performed the Biozec COVID-19 IgM/IgG Rapid Test lateral flow immunoassay (LFIA) in 66 consecutive patients in a real-life study performed in a hospital partially devoted to COVID 19 infection.

Patients with COVID-19 disease, which diagnosis was based on clinical evaluation and positive RT -PCR SARS Cov 2 identification, have been prospectively followed-up.

Patients in the recovery phase of infection, after the resolution of symptoms and a negative result for the first RT-PCR test, performed the second RT-PCR determination at least 24 hours afterward as well as a serologic qualitative determination of IgM / IgG to SARS CoV2.

Biozec COVID-19 IgM/IgG was performed according to the manufacturer’s instructions.

Patients were informed that the serological test results would not influence any clinical decisions about their specific case and gave oral informed consent.

We have evaluated 66 patients with confirmed SARS Cov 2 infection. The median age was 59.5 years (44-70). Thirty-two patients were women. The overall median time of symptoms was 7 days.[6–9] Thirty-seven patients had mild disease, 26 had moderate disease, and 3 severe disease. The mean neutrophils count upon diagnosis was 3,690 X109 (2,470-5,082) and lymphocytes count was 1,040 X109 IQR (852-1,335). The median CPR upon diagnosis was 2.7 mg/dl (1.26-8.7). In our sample, 21 patients had a previous history of hypertension, and 8 had Diabetes Mellitus. Thirty-eight have been treated with hydroxychloroquine, 37 with azithromycin and in 10 patients a five-day course of methylprednisolone was used.

The rapid serologic test was performed on the day of the second NT-PCR swab test (as cure definition). The mean time from the beginning of symptoms up until this second swab test has been 20.5 days (18-23). Fifty-six patients have had a positive result for IgG (85 % of the whole sample).

We did not have identified any variable associated with a positive rapid test result in univariate analysis.

Our results showed that 85% of patients have IgG identification by LFIA method upon 20.5 days of symptoms initiation. These results suggest that most patients develop antibodies against SARS CoV 2. The clinical significance of these antibodies could not be evaluated in our study.

Humoral immune response, especially the production of neutralizing antibody, plays a protective role by limiting the infection and prevents re-infection in the future. In our study, 15 % of the patients did not produce a significant amount of IgG to be detected by LFIA. In fact, even when using ELISA in the same type of patients, there is up to 30% of patients that has low levels of antibodies.[5]

How these patients have recovered without developing antibodies against SARS Cov 2 virus (or with low titters of antibodies) and whether they are at risk of re-infection should be addressed in further studies.

A previous report evaluated the seroconversion using three immunoassays, both in post-exposure and in post-symptoms onset simultaneously using ELISA, LFIA, and chemiluminescence immunoassay. The diagnostic performance was identical among the three methods. The median seroconversion time for IgM and IgG antibodies was 18 and 20 days post-exposure and 10 and 12 days post-symptom onset, respectively. These results have shown that qualitative and quantitative tests are alike in terms of the identification of antibodies.[6]

In our study, we used a qualitative LFIA test. We hypothesize that it might be used together with molecular diagnostic tests to achieve better accuracy in the diagnosis of SARS CoV 2 infection. It might also be useful in an epidemiologic context.

Previously, we have reported that this test has a low sensitivity in SARS CoV 2 infection diagnosis.[6] Our current results give some insight into its potential in two ways. First, to individualize people who have had contact with the virus, to avoid disease spread; and second, to study the real prevalence of the disease.

Previous studies have shown that IgM and IgG against SARS CoV were detectable 7 days after infection and persisted for 2–3 years. Like SARS CoV, COVID-19 patients also showed similar characteristics. As demonstrated by Zhang et al., both IgM and IgG can be detected 5 days after the onset of the disease using anti-SARS CoV 2 ELISA assay.[7–9]

Our results support the hypothesis that the emergence of IgG antibodies, as detected by LFIA, might be considered as surrogate evidence of recovery.

The utilization of this test has some limitations, namely because it is a qualitative test. For a quantitative evaluation of IgG levels, ELISA assay should be used. However, the complexity associated with its realization and the fact that its results take longer make it less useful for the intended purposes: preventing the spread of the disease and the epidemiological assessment of disease prevalence.

In summary, studying 66 consecutive patients, we have shown that most of the patients develop IgG antibodies reporting that more than 4 in every five patients with contact to SARS CoV 2 disease develop antibodies detectable with LFIA.

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