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Scientific letter

**Oropharyngeal persistence of SARS-CoV-2: Influence of viral load**

*Persistencia orofaríngea de SARS-CoV-2: influencia de la carga viral*

Dear Editor:

Several clinical factors have been associated with oropharyngeal persistence of SARS-CoV-2. Our study included the viral load determination by quantitative PCR (Exact Diagnostics SARS-CoV-2 Standard; Bio-Rad, Texas, USA) of 33 COVID-19 patients with persistent PCR in nasopharyngeal samples >4 weeks and 33 controls, adjusted for age and sex, who tested negative before. Values are expressed as Log10 mean viral load (N and R genes) and cycle threshold (Ct) values. The Clinical Research Ethics Committee (CREC) of Cantabria approved the study. Student’s t-test or Mann–Whitney U were used to compare quantitative variables, and chi-square or Fisher’s test for qualitative variables. All analyses were performed using SPSS 23.0 software (Chicago, IL, USA). A p value <0.05 was considered statistically significant.

The viral load of COVID-19 patients with mild disease (outpatients) and persistent SARS-CoV-2 was significantly higher than that of their controls in copies/ml (Log10: 7.04 ± 1.81 copies/ml vs. 5.15 ± 2.14 copies/ml; p = 0.018) and Ct of the N gene (25.7 ± 5.6 versus 31.3 ± 6.7 in controls; p = 0.02). Their clinical profile showed no peculiarities (Table 1). Hospitalized patients with persistent SARS-CoV-2 (49 ± 20 days) had the same viral load as their controls (Log10: 6.21 ± 2.06 copies/ml vs. 5.98 ± 1.97 copies/ml; p = 0.73 and Ct values of the N and R genes) and there were no differences in terms of their clinical characteristics (Table 1).

Viral shedding in respiratory samples varies from 2 to 3 weeks after the onset of symptoms, but it has been reported up to 83 days later. Various clinical factors are related to this fact, including male gender, age over 65, the use of invasive mechanical ventilation, the presence of immunodeficiency or diabetes. Some studies find that persistence is more common in seriously ill hospitalised patients with high comorbidity; however, others associate it with asymptomatic cases. The use of corticosteroids and lopinavir/ritonavir also seems to be associated. Our study has the limitations of observational studies and we do not know the clinical translation of the persistence of SARS-CoV-2; however, we consider it important to continue analysing the problem of prolonged shedding and fluctuations of the virus.

**Table 1**

| COVID-19 patients. | | |
|-----------------|------------------|------------------|
| **Variables**   | **Outpatients**  | **Controls**     |
| **Age (years)** | 57 (20)          | 56 (20)          | 0.85 |
| **Sex, n (%)**  | **65, 71 (16)**  | 72 (13)          | 0.78 |
| Smoking, n (%)  | **65, 74 (40)**  | 64 (40)          | 0.63 |
| ACE or ARB, n (%) | **65, 56 (40)** | 49 (20)         | <0.001 |
| Comorbidities, n (%) | **65, 74 (40)**   | 20 (50)         | 0.19 |
| Hypertension    | 3 (20)           | 1 (7)            | 0.35 |
| Dyslipidemia    | 3 (20)           | 3 (20)           | 0.60 |
| Diabetes mellitus | 0 (0)             | 1 (7)            | 0.46 |
| Asthma          | 0 (0)            | 0 (0)            | –   |
| Atrial fibrillation | 1 (7)            | 1 (7)            | 0.72 |
| Neoplasms       | 1 (7)            | 0 (0)            | 0.53 |
| COPD            | 0 (0)            | 0 (0)            | –   |
| Symptomatic, n (%) | 11 (73)           | 7 (47)           | 0.18 |
| Duration of symptoms, (days) | 15 (8) | 12 (5) | 0.48 |
| Chest x-ray, n (%) | 2 (20)          | 1 (7)            | 0.42 |
| Pulmonary infiltrates, n (%) | 2/1 (66) | 0/1 (0) | 0.36 |
| **Viral load**  | Log10 (copies/ml) | 7.0 (1.8) | 5.1 (2.1) | 0.018 |
| N gene Ct       | 25.7 (5.6)       | 31.3 (6.7)       | 0.020 |
| R gene Ct       | 25.1 (7.0)       | 28.5 (7.5)       | 0.12 |
| Hospitalized patients | | | | |
| **Variables**   | **Outpatients**  | **Controls**     |
| **Age (years)** | 71 (16)          | 72 (13)          | 0.78 |
| **Sex, n (%)**  | 7 (40)           | 7 (40)           | 0.63 |
| Days until negative PCR | 49 (20) | 64 (40) | <0.001 |
| Smoking, n (%)  | 0 (0)            | 4 (22)           | 0.10 |
| ACE or ARB, n (%) | 8 (44)          | 4 (22)           | 0.14 |
| Comorbidities, n (%) | 11 (61)           | 7 (39)           | 0.15 |
| Hypertension    | 7 (39)           | 10 (56)          | 0.25 |
| Dyslipidemia    | 2 (11)           | 2 (11)           | 0.64 |
| Diabetes mellitus | 1 (5.6)        | 0 (0)            | 0.50 |
| Asthma          | 0 (0)            | 2 (22)           | 0.24 |
| Atrial fibrillation | 0 (0)            | 1 (5)            | 0.50 |
| Neoplasms       | 0 (0)            | 3 (17)           | 0.30 |
| Duration of symptoms, (days) | 14 (7) | 16 (10) | 0.49 |
| Chest x-ray, n (%) | 18 (100)        | 18 (100)         | –   |
| Pulmonary infiltrates, n (%) | 12 (67) | 17 (94) | 0.10 |

**Mean (SD) or n (%).**

| ARBs: angiotensin receptor blockers; COPD: chronic obstructive pulmonary disease; ACE: ACE inhibitors. |

Mean (SD) or n (%).

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**Conflicts of interest**

The authors declare that they have no conflicts of interest.

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