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LETTER TO THE EDITOR

# Nasopharyngeal SARS-CoV-2 viral RNA shedding in patients with diabetes mellitus

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## Dear Editor

The paper by Buetti et al. [1] regarding the prolonged SARS-CoV-2 viral shedding in lower respiratory tract samples of critically ill patients presented a fascinating finding. In this Swiss cohort, the presence of diabetes mellitus (DM) in critically ill patients proved to be a risk factor for prolonged SARS-CoV-2 RNA. In a recent work, we assessed clinical and demographic risk factors for prolonged viral RNA shedding and time to achieve the cessation of viral RNA shedding (CVS) in 251 patients with COVID-19 based on nasopharyngeal samples only [2].

We identified 34 (14%) patients with DM (Table 1). These patients were older (60 years [IQR 15.5] vs. 50 years [IQR 28]; $p < 0.001$) and had a higher frequency of comorbidities such as obesity, coronary artery disease, chronic obstructive pulmonary disease, and heart failure ($p < 0.01$) when compared to patients without DM. Patients with DM were more frequently hospitalized (61.8 vs. 18.9%; $p < 0.001$) than patients without DM. Dyspnea, diarrhea, and dizziness were more frequently seen in patients with DM ($p < 0.01$) at the time of diagnosis. Despite these differences, there was no difference in time to achieve CVS when compared to patients with and without DM (24 days (IQR 11.8) vs. 23 days (IQR 12); $p = 0.591$). This is best observed in Fig. 1. Interestingly, dizziness was more commonly reported at the time of CVS in patients with DM. DM was not associated with prolonged viral RNA shedding in a univariate regression model ($p = 0.49$).

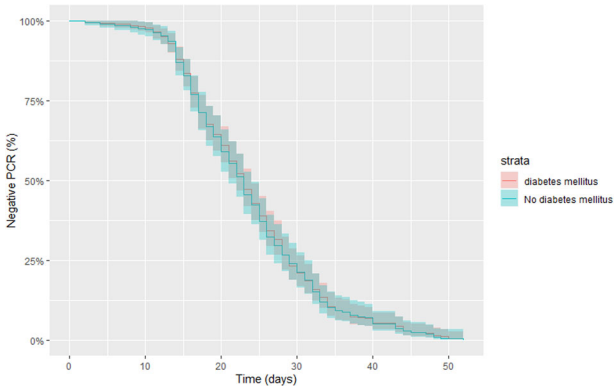


**Fig. 1** Time to cessation of SARS-CoV-2 viral RNA shedding in people with and without diabetes mellitus

In contrast to Buetti et al., our findings suggest that patients with DM do not show prolonged RNA viral shedding based on nasopharyngeal sampling despite older age and a higher frequency of comorbidities. DM has been described by Wang et al. [3] as a risk factor for viral RNA detection in both nasopharyngeal and sputum samples. Nevertheless, the presence of DM was not associated with prolonged shedding in their sample either. The determination of whether prolonged viral RNA shedding in lower respiratory samples represents a particular phenomenon of patients with DM or other immunocompromising states requires additional research and collaboration that combines different types of samples, timelines, and clinical characteristics.

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**Table 1** Clinical characteristics, timing of PCR test, symptoms at diagnosis, and symptoms after cessation of viral shedding of COVID-19 patients with and without diabetes mellitus

| Clinical characteristics | Diabetes mellitus ($N = 34$) | No diabetes mellitus ($N = 217$) | Total ($N = 251$) | $p$ value |
|---|---|---|---|---|
| Demographics | | | | |
| Age, years | 60 (15.5) | 50 (28) | 53 (27) | **<0.001**[a] |
| Male | 20 (58.8%) | 128 (59%) | 148 (59%) | 0.986[b] |
| Hospitalized | 21 (61.8%) | 41 (18.9%) | 62 (24.7%) | **<0.001**[b] |
| Comorbidities | | | | |
| Coronary artery disease | 25 (73.5%) | 45 (20.7%) | 70 (27.9%) | **<0.001**[b] |
| Obesity | 19 (55.9%) | 56 (25.8%) | 75 (29.9%) | **<0.001**[b] |
| Chronic obstructive pulmonary disease | 9 (26.5%) | 13 (6.0%) | 22 (8.8%) | **<0.001**[b] |
| Chronic kidney disease | 5 (14.7%) | 15 (6.9%) | 20 (8.0%) | 0.119[b] |
| Heart failure | 4 (11.8%) | 5 (2.3%) | 9 (3.6%) | **0.006**[b] |
| Asthma | 3 (8.8%) | 43 (19.8%) | 46 (18.3%) | 0.123[b] |
| Use of anti-neoplastic chemotherapy, immunomodulators, or immunosuppressive drugs | 3 (8.8%) | 13 (6.0%) | 16 (6.4%) | 0.53[b] |
| Initial symptoms | | | | |
| Cough | 30 (88.2%) | 181 (83.4%) | 211 (84.1%) | 0.475[b] |
| Dyspnea | 26 (76.5%) | 107 (49.3%) | 133 (53.0%) | **0.003**[b] |
| Fever ($T > 38.5$ °C) | 16 (47.1%) | 110 (50.7%) | 126 (50.2%) | 0.694[b] |
| Subjective fever | 8 (23.5%) | 43 (19.8%) | 51 (20.3%) | 0.617[b] |
| Chills | 19 (55.9%) | 104 (47.9%) | 123 (49.0%) | 0.388[b] |
| Shivering | 0 (0.0%) | 1 (0.5%) | 1 (0.4%) | 0.692[b] |
| Muscle pain | 27 (79.4%) | 139 (64.1%) | 166 (66.1%) | 0.079[b] |
| Diarrhea | 17 (50.0%) | 55 (25.3%) | 72 (28.7%) | **0.003**[b] |
| Headache | 12 (35.3%) | 82 (37.8%) | 94 (37.5%) | 0.78[b] |
| Sore throat | 15 (44.1%) | 94 (43.3%) | 109 (43.4%) | 0.93[b] |
| Ageusia | 7 (20.6%) | 44 (20.3%) | 51 (20.3%) | 0.966[b] |
| Anosmia | 7 (20.6%) | 48 (22.1%) | 55 (21.9%) | 0.841[b] |
| Dizziness | 14 (41.2%) | 43 (19.8%) | 57 (22.7%) | **0.006**[b] |
| Timing to PCR tests | | | | |
| Days from symptoms to positive PCR (IQR) | 2 (5.5) | 3 (6) | 3 (6) | 0.509[a] |
| Days from symptoms to negative PCR (IQR) | 24 (11.8) | 23 (12) | 23 (12) | 0.591[a] |
| Symptoms at time of negative PCR | | | | |
| Cough | 7 (20.6%) | 55 (25.3%) | 62 (24.7%) | 0.55[b] |
| Dyspnea | 0 (0.0%) | 2 (0.9%) | 2 (0.8%) | 0.574[b] |
| Chills | 0 (0.0%) | 1 (0.5%) | 1 (0.4%) | 0.692[b] |
| Muscle pain | 11 (32.4%) | 65 (30.0%) | 76 (30.3%) | 0.777[b] |
| Diarrhea | 1 (2.9%) | 1 (0.5%) | 2 (0.8%) | 0.13[b] |
| Headache | 1 (2.9%) | 13 (6.0%) | 14 (5.6%) | 0.471[b] |
| Sore throat | 7 (20.6%) | 42 (19.4%) | 49 (19.5%) | 0.866[b] |
| Ageusia | 6 (17.6%) | 41 (18.9%) | 47 (18.7%) | 0.862[b] |
| Anosmia | 6 (17.6%) | 45 (20.7%) | 51 (20.3%) | 0.677[b] |
| None | 9 (26.5%) | 56 (25.8%) | 65 (25.9%) | 0.934[b] |
| Unknown | 1 (2.9%) | 10 (4.6%) | 11 (4.4%) | 0.659[b] |
| Dizziness | 6 (17.6%) | 12 (5.5%) | 18 (7.2%) | **0.011**[b] |

[a]Kruskal–Wallis rank sum test

[b]Pearson's Chi-squared test

Bold values indicate statistical significance

## Compliance with ethical standards

**Conflict of interest** J.C.O. has provided consulting services for Elsevier, Inc and Bates College.

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