



Time course of exercise capacity in patients recovering from COVID-19-associated pneumonia. Authors' reply

Elisabetta Zampogna¹, Nicolino Ambrosino², Giovanni Battista Migliori³,
Dina Visca^{1,4}

"I have come here to bury Caesar, not to praise him."

William Shakespeare. Julius Caesar, Act 3, Scene 2

The early phase of the COVID-19 pandemic forced health systems to undertake continuous organizational changes, often more empiric than evidence-based ones.⁽¹⁾ In addition, rehabilitation professionals had to revise programs in a newly changed environment: spaces, equipments, and aids could not be used as in the past; the professionals could not wear their usual "clothes," but had to wear personal protective equipment.⁽²⁾ This was a process that required time and a solid scientific basis to guarantee adequate treatment.

The pandemic has been associated with an increase of "last-minute" and retrospective publications with a high level of retractions.⁽³⁾ However, we could not wait for well-designed prospective randomized controlled trials before starting interventions in daily clinical practice. Therefore, we believe that, despite all the inbuilt limitations of observational, uncontrolled, or retrospective studies, the scientific community had to answer the emerging questions posed by the pandemic, including those in the field of rehabilitation, in order to make use of the available data timely.

That is why we thank Borghi-Silva et al.⁽⁴⁾ for their editorial, who showed interest in our study⁽⁵⁾ and gave constructive criticism, most of which we agree with. We were and are well aware of the unavoidable limitations of that⁽⁵⁾ and other studies⁽⁶⁾ published by our group on that topic and will not annoy the readers in an attempt to "defend" our work.

However, we are happy to provide a few answers and comments. Comparing the inpatients undergoing rehabilitation with those discharged, the former group presented with lower six-minute walk distance (6MWD) in % of predicted values [median = 65% (IQR, 58-82) vs. 98 (IQR, 74-109); $p = 0.0007$]; higher oxygen

desaturation ($p < 0.0001$), and lower Short Physical Performance Battery scores ($p = 0.03$), with no other differences (unpublished data). Patients undergoing rehabilitation might have experienced faster/better functional recovery, although all of the enrolled subjects with a 6MWD $< 75\%$ of predicted improved, even those not undergoing rehabilitation.

We find the issue raised by Borghi-Silva et al.⁽⁴⁾ regarding the best way to assess physical performance other than the 6MWD used in our study very interesting.⁽⁵⁾ Recently, we have reviewed the types of measures used in order to assess physical performance in COVID-19 survivors.⁽⁶⁾ We found that a wide variety of tests have been used, making comparisons among the studies difficult. All such measures show impairment in physical performance in those patients. However, the quality of most of the studies was considered low or fair.⁽⁶⁾ Therefore, we agree on the need to standardize a common battery of evaluations to improve the characterization of functional limitations of patients.

Another issue discussed in the editorial⁽⁴⁾ and in our study⁽⁵⁾ was the need to follow up those patients strictly. In addition to presenting with lung function damage, they might show impairment in their physical performance six months after the infection.

In conclusion, we thank again Borghi-Silva et al.⁽⁴⁾ for their stimulating comments, addressing at least two important issues in the COVID-19 era: the need of rigorous methodology in scientific research (analysis and reporting of data even in emergency conditions) and the attention that clinicians must pay to long-term functional limitations associated with COVID-19 (and the measures to assess them).

"Things without all remedy should be without regard: what's done is done."

William Shakespeare. Macbeth. Act 3, Scene 2.

REFERENCES

1. Winck JC, Ambrosino N. COVID-19 pandemic and non invasive respiratory management: Every Goliath needs a David. An evidence based evaluation of problems. Pulmonology. 2020;26(4):213-220. <https://doi.org/10.1016/j.pulmoe.2020.04.013>
2. Ippolito M, Vitale F, Accurso G, Iozzo P, Gregoretti C, Giarratano A, et al. Medical masks and Respirators for the Protection of Healthcare Workers from SARS-CoV-2 and other viruses. Pulmonology. 2020;26(4):204-212. <https://doi.org/10.1016/j.pulmoe.2020.04.009>

1. Divisione di Pneumologia Riabilitativa, Istituti Clinici Scientifici Maugeri – IRCCS – Tradate, Italia.

2. Divisione di Pneumologia Riabilitativa, Istituti Clinici Scientifici Maugeri – IRCCS – Montescano, Italia.

3. Servizio di Epidemiologia Clinica delle Malattie Respiratorie, Istituti Clinici Scientifici Maugeri – IRCCS – Tradate, Italia.

4. Dipartimento di Medicina e Chirurgia, Malattie Respiratorie, Università degli Studi dell'Insubria, Varese/Como, Italia.

3. Boschiero MN, Carvalho TA, Marson FAL. Retraction in the era of COVID-19 and its influence on evidence-based medicine: is science in jeopardy?. *Pulmonology*. 2021;27(2):97-106. <https://doi.org/10.1016/j.pulmoe.2020.10.011>
4. Borghi-Silva A, Krishna AG, Garcia-Araújo AS. Importance of functional capacity assessment and physical exercise during and after hospitalization in COVID-19 patients: revisiting pulmonary rehabilitation. *J Bras Pneumol*. 2021;47(4):e20210277.
5. Zampogna E, Ambrosino N, Saderi L, Sotgiu G, Bottini P, Pignatti P, et al. Time course of exercise capacity in patients recovering from COVID-19-associated pneumonia. *J Bras Pneumol*. 2021;47(4):e20210076. <https://doi.org/10.36416/1806-3756/e20210076>
6. Simonelli C, Paneroni M, Vitacca M, Ambrosino N. Measures of physical performance in COVID-19 patients: a mapping review [published online ahead of print, 2021 Jun 24]. *Pulmonology*. 2021;S2531-0437(21)00125-2. <https://doi.org/10.1016/j.pulmoe.2021.06.005>