Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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The Role of Incentive Spirometry for Patients with COVID-19

In reply:

We thank the authors for their thoughtful discussion on the need for more rigorous data regarding the use of incentive spirometry (IS) in patients affected by the 2019 Coronavirus Disease (COVID-19). We appreciate their focus on evidence-based medicine and the time they put into assessing this intervention at their institution. Originally, we proposed that COVID-19 patients may benefit from IS via its proposed mechanism of improving ventilation/perfusion mismatch and alveolar-PaO_2 gradient, thus reducing intrapulmonary shunting and the risk of atelectasis [1,2]. Patients with COVID-19-related acute respiratory distress syndrome have decreased PaO_2:FiO_2 ratios due to intrapulmonary shunting; thus, it is conceivable that they may benefit from IS. Nonetheless, we acknowledge that there is a paucity of evidence surrounding the beneficiality of IS and that there is a critical need for practitioners to be judicious in their use of resources while the healthcare system is burdened by the pandemic. Despite these points, we would be remiss to dismiss the potential role of IS in COVID-19 patients so early based on what the authors have presented.

In their reply, the authors included data from a small, retrospective study that they conducted at their institution. As with any research, it is important to acknowledge the limitations of the presented study. First, the sample size was quite small and thus was very likely underpowered to be reporting on a primary outcome as significant as mortality. It was composed of 155 COVID patients total, with only 41 of those having been prescribed IS. Additionally, it should be noted that prescription of IS does not equate to actual usage. There were likely many more confounding variables which were not, and likely could not have been, adequately controlled for given the retrospective nature of the study. Given the concern of this being an underpowered study with the possibility of significant confounding variables, we believe that the authors' study is insufficient to confirm or deny the benefit of IS in COVID-19 patients.

The authors also correctly brought up that IS is not a costless intervention and this must be considered in the resource-limited times we are experiencing. One of the reasons that we wanted to share the idea of using IS in COVID-19 patients is because we see potential for it to be a cost-saving measure. When COVID-19 patients decompensate to the point of requiring hospitalization, especially ICU admission, it can result in lengthy and costly hospital stays. In some situations, IS could be the more judicious choice rather than waiting for a patient to need a hospital bed. We agree with the authors that a cost:benefit ratio analysis would be helpful to determine if IS is a fiscally responsible intervention for patients presenting with COVID-19.

As the authors noted, randomized-controlled trials are needed to further assess the use of IS in COVID-19 patients so that the potential confounding factors seen in a retrospective study may be avoided. We suggest that future studies comment not only on mortality and intubation rates as the authors did, but also on long-term morbidity outcomes, such as the incidence of pulmonary-related post-COVID-19 conditions, also referred to as “long COVID” or “post-acute sequelae of COVID-19.” Finally, when performing and prescribing IS, it is important to ensure proper training and technique, as the authors noted. We agree that mere provision of IS without training is likely inadequate to provide any benefit to patients. Again, we want to thank the authors for the opportunity to further discuss IS use in COVID-19 patients so that we may continue to improve how we care for this patient population.

Meetings

None.

Grants

None.

Conflicts of interest

None.

Author contributions

None except listed.

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