



The “Long COVID” Respiratory Symptoms—Concerns with Frailty and Respiratory Diseases

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Respiratory complications are more common in elderly patients, especially in those with a history of respiratory disorders. Additionally, before the coronavirus disease 2019 (COVID-19) outbreak, respiratory diseases (e.g., chronic obstructive pulmonary disease) and pulmonary complications due to lower respiratory infections were some of the leading causes of death in the elderly population.¹ Thus, there is a rising concern in long-term symptoms due to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, mainly in frail elderly people with respiratory pathologies and comorbidities.^{2–4}

Recently, the term “Long COVID” had being introduced to describe the long-term symptoms of the SARS-CoV-2 infection in patients recovered and discharged from hospital.⁵ The SARS-CoV-2 virus interact with angiotensin-converting enzyme 2 negatively affecting the vascular endothelium and leading to systemic injury.⁶ Amidst, the respiratory system is directly lesioned by COVID-19, which may require health strategies for elderly patients with preexisting respiratory diseases, mainly in low-income and middle-income countries due to limited resources. Additionally, SARS-CoV-2 infection severity and mortality has been clearly related to vulnerability due to age-related accumulation of deficits, rather than chronological age itself.^{3,4} In this scenario, the need of research support is a necessary step to understand, in an international and interdisciplinary perspective, the long-term symptoms of COVID-19 in this population to manage and preserve their health lifelong. Thus, we performed a literature review on PUBMED database until December 16, 2021 using keywords and Medical Subject Headings terms related to “postacute COVID-19 syndrome” and “respiratory

system,” of which the main findings were summarized in the paragraph below.

Emergent data suggested that 1 to 3 months after discharge, patients still had radiologic abnormalities consistent with pulmonary dysfunction (e.g., interstitial thickening and fibrosis), decreased diffusion capacity for carbon monoxide, and diminished respiratory muscle strength.^{7–10} In addition, it was observed airflow obstruction, as well as reduced lung volume measurements (total lung capacity, forced vital capacity, and forced expiratory volume in one second) after more than 1 month postdischarge or more than 2 months postadmission.¹¹

With the abovementioned symptoms, this leads to concerns about the elderly population with vulnerability due to a history of preexisting respiratory diseases. Frailty is a complex condition characterized by declining function across several homeostatic systems leading to increased vulnerability to stressors and risk of adverse health outcomes with age.^{12–14} At the beginning of COVID-19 pandemic era, initial reports from Wuhan revealed that most cases of COVID-19 have occurred in people aged 60 or above.¹⁵ Additional reports from Italy and the United Kingdom, which are among the most hit countries in Europe, have confirmed the high risk of death in older adults, particularly in those with preexisting diseases (e.g., cardiovascular and respiratory diseases).^{16–18} SARS-CoV-2 is a novel virus, which means there is still much that the medical and wider research community do not know. Thus, well-conducted long-term research is needed to follow-up discharged patients with symptoms from “long COVID” to treat sequelae in the vulnerable population, taking into account frailty assessment and the history of comorbidities.^{5,14,19}

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We hope this Letter encourage future researches to identify and manage long-term complications due to COVID-19 infection and support elderly patients with vulnerability due to preexisting comorbidities, mainly in the respiratory system.

Authors' Contributions following the CRediT (Contributor Roles Taxonomy)

R.A.B.N.: Conceptualization, writing - original draft.

W.J.F.: Supervision, writing - review and editing.

Conflict of Interest

None declared.

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References

- 1 Beard JR, Officer A, de Carvalho IA, et al. The World report on ageing and health: a policy framework for healthy ageing. *Lancet* 2016;387(10033):2145–2154
- 2 Adeloye D, Elneima O, Daines L, et al; International COVID-19 Airways Diseases Group. The long-term sequelae of COVID-19: an international consensus on research priorities for patients with pre-existing and new-onset airways disease. *Lancet Respir Med* 2021;9(12):1467–1478
- 3 Aliberti MJR, Szlejf C, Avelino-Silva VI, et al; COVID HCFMUSP Study Group. COVID-19 is not over and age is not enough: using frailty for prognostication in hospitalized patients. *J Am Geriatr Soc* 2021;69(05):1116–1127
- 4 Bashir S, Moneeba S, Alghamdi A, et al. Comorbidities in patients with covid-19 and their impact on the severity of the disease. *J Health Allied Sci* 2020;11:1–7
- 5 Mahase E. Covid-19: what do we know about “long Covid”? *BMJ* 2020;370:m2815
- 6 Subbarao K, Mahanty S. Respiratory virus infections: understanding COVID-19. *Immunity* 2020;52(06):905–909
- 7 Zhao YM, Shang YM, Song WB, et al. Follow-up study of the pulmonary function and related physiological characteristics of COVID-19 survivors three months after recovery. *EClinicalMedicine* 2020;25:100463
- 8 Huang Y, Tan C, Wu J, et al. Impact of coronavirus disease 2019 on pulmonary function in early convalescence phase. *Respir Res* 2020;21(01):163
- 9 George PM, Barratt SL, Condliffe R, et al. Respiratory follow-up of patients with COVID-19 pneumonia. *Thorax* 2020;75(11):1009–1016
- 10 Torres-Castro R, Vasconcello-Castillo L, Alsina-Restoy X, et al. Respiratory function in patients post-infection by COVID-19: a systematic review and meta-analysis. *Pulmonology* 2021;27(04):328–337
- 11 Long Q, Li J, Hu X, Bai Y, Zheng Y, Gao Z. Follow-ups on persistent symptoms and pulmonary function among post-acute covid-19 patients: a systematic review and meta-analysis. *Front Med (Lausanne)* 2021;8:702635
- 12 Rockwood K, Mitnitski A. Frailty in relation to the accumulation of deficits. *J Gerontol A Biol Sci Med Sci* 2007;62(07):722–727
- 13 Fried LP, Tangen CM, Walston J, et al; Cardiovascular Health Study Collaborative Research Group. Frailty in older adults: evidence for a phenotype. *J Gerontol A Biol Sci Med Sci* 2001;56(03):M146–M156
- 14 Maltese G, Corsonello A, Di Rosa M, et al. Frailty and COVID-19: a systematic scoping review. *J Clin Med* 2020;9(07):2106
- 15 Report of the WHO–China Joint Mission on Coronavirus Disease 2019 (COVID-19). Coronavirus Age, Sex, Demographics (COVID-19)–Worldometer. Accessed December 16, 2021 at: <http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-fea8db1a8f51>
- 16 Onder G, Rezza G, Brusaferro S. Case-fatality rate and characteristics of patients dying in relation to COVID-19 in Italy. *JAMA* 2020;323(18):1775–1776
- 17 Docherty AB, Harrison EM, Green CA, et al; ISARIC4C investigators. Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO Clinical Characterisation Protocol: prospective observational cohort study. *BMJ* 2020;369:m1985
- 18 Chakrabarty B, Das D, Bulusu G, Roy A. Network-Based Analysis of Fatal Comorbidities of COVID-19 and Potential Therapeutics. Accessed December 16, 2021 at: https://chemrxiv.org/articles/Network-Based_Analysis_of_Fatal_Comorbidities_of_COVID-19_and_Potential_Therapeutics/12136470
- 19 Guan C, Niu H. Frailty assessment in older adults with chronic obstructive respiratory diseases. *Clin Interv Aging* 2018;13:1513–1524