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Reviewer A

The authors have performed a prospective observational study to follow closely lung function and exercise capacity changes for 1 year following hospitalization for COVID-19. The observation involves a comparison to healthy subjects. I do believe that the authors have done a good job at following the patients prospectively at close intervals. However, this study does not add anything new to the literature. As the authors mention in their discussion, their results are consistent with previous studies. Closer intervals of follow up do not help us much because it has not revealed any novel information and it does not appear that there is any good reason to adopt such a practice. The fact that the lung function and exercise capacity are lower than healthy subjects is not a surprise. At this point, fortunately or unfortunately, we have enough pre-existent literature to make the current paper not critical for publication.

Reply: Thank you for your comment. Our study showed the improvement of lung function and exercise capacity with shorter intervals time of follow up. Moreover, the study about COVID-19 pneumonia on long term outcome in Thai population is still limited. Our study added information that the long-term impacts of COVID-19 pneumonia in Thai population which were the same as other population.

Reviewer B

The work presented is comprehensive and methodologically accurate.

The following points should be revised:

1. The adopted English should be extensively revised.

Reply: Our manuscript was edited by a native English speaker.

2. Any correlations between the data presented and any imaging data should be deeper discussed.

Reply: The correlation between data presented and any imaging data was revised. Revised manuscript in the results section, page no.9-10, line 189-217, highlighted.

3. The paper could be integrated ocn the insights provided by these two articles.

Orzes N, Pini L, Levi G, Uccelli S, Cettolo F, Tantucci C. A prospective evaluation of lung function at three and six months in patients with previous SARS-COV-2 pneumonia. Respir Med. 2021 Sep;186:106541. doi: 10.1016/j.rmed.2021.106541. Epub 2021 Jul 10. PMID: 34280885; PMCID: PMC8272067.

Pini L, Montori R, Giordani J, Guerini M, Orzes N, Ciarfaglia M, Arici M, Cappelli C, Piva S, Latronico N, Muiesan ML, Tantucci C. Assessment of respiratory function and exercise tolerance at 4-6 months after COVID-19 infection in patients with pneumonia of different severity. Intern Med J. 2023 Feb;53(2):202-208. doi: 10.1111/imj.15935. Epub 2022 Sep 28. PMID: 36114661; PMCID: PMC9538800.

Reply: We integrated these articles in the introduction section and discussion section per your suggestion. Revised manuscript in the introduction section page no.4, line 71-75, highlighted and in reference section page no. 17, line 364-369, highlighted.

Reviewer C

1. Can you provide detail studies on IMPULSE Oscillometry.

Reply: We provided more detail of IOS in the methods section per your suggestion. Revised manuscript in the methods section page no.6-7, line 130-143, highlighted.

2. Can you provide details of laboratory studies necessary in pneumonia.

Reply: We provided more detail of laboratory studies necessary in pneumonia in the table 1 per your suggestion. Revised manuscript in the table 1 page no.21, highlighted.

3. Can you conclude in better way.

Reply: The conclusion section was revised per your suggestion. Revised manuscript in the conclusion section page no.14, line 308-312, highlighted.

4. Discussion needs to be modified by authors for detailed previous studies according to their setup.

Reply: The discussion section was revised per your suggestion. Revised manuscript in the discussion section page no.11-13, line 227-292, highlighted.

Reviewer D

This is an observational study on the trajectories of different aspects of pulmonary lung function and exercise capacity in COVID-19 pneumonia of different severity survivors. The Authors explored this issue through different pulmonary function tests at different time points in the follow-up of these patients, showing some residual impairment that makes these patients not completely comparable to healthy subjects 1 year after the infection. Although the effort of the Authors must be acknowledged and congratulated, the manuscript in its present form has many flaws and the flow of it is difficult to follow:

1. Novelty: the authors claim the repeated time points of testing as an element of novelty, but this seems to be something anyhow explored in literature. Particularly, DLCO represented the PFT mostly reported as impaired in the long term follow up of COVID-19 survivors (see for example Huang et al Lancet Respir Med 2022;10: 863–76); the lack of this data in the dataset presented is quite a limitation for this study (as the Authors themselves fairly acknowledged in the discussion). The evaluation of pulmonary mechanical properties through IOS on the

other hand is of some novelty, and the paper could definitely be more focused on that point. Regarding FeNO, it is not clear the possible correlation with COVID-19 and possible sequelae, and while the Authors make some references to negative studies on the subject, it does not emerge why they choose to include the test in their protocol.

Reply: We added the novelty of IOS information and more discussion of IOS per your suggestion. Revised manuscript in the introduction section page no.4, line 75-76, highlighted and in the discussion section page no.9-10, line 199-206, highlighted. However, the study of FENO in our study aimed to confirm the results of previous studies which were mention in the discussion section. Revised manuscript in the discussion section page no.10, line 207-212, highlighted.

2. Structure: the introduction goes too much in deep into the literature, reporting data that would have been useful in the discussion. The results are reported extensively in the text (this could be cut and presented adding some tables), while the discussion is mostly a repetition of the results. The data obtained from the study should be put more in the context of contemporary literature.

Reply: The introduction section was revised per your suggestion. Moreover, we moved some part of introduction to the discussion part. Revised manuscript in the introduction section page no.4-5, line 71-93, highlighted.

3. Methodology: The Authors present a sample size calculation, which is based on testing the hypothesis that there is a difference between COVID-19 pneumonia survivors at 1 month from the disease and healthy control in the 6 minute walk distance, making this the main outcome of their study (which is not made clear when presenting the study). As the calculation is based on a previous study on COVID-19 survivors, from a methodological

point of view, it seems that this study has the power to replicate a previous study (adding to the reduced novelty of the data).

Reply: The main finding of our study was lung function and exercise capacity. Therefore, the sample size was calculated form the findings of previous publication. However, the results of lung function especially for IOS may be under power due to small sample size. We mentioned this limitation in the discussion section. Revised manuscript in the discussion section page no.14, line 302-305, highlighted.

4. Data discussion and interpretation: firstly, the control group presents a significant fluctuation of the PFT data, particularly from the 9-month time point to 12-month time point. The Authors should account in some way for this when discussing their results. As mentioned above, the discussion does not focus enough of the clinical interpretation of the results and on the comparison with previous literature. Particularly, the data about IOS should be discussed more in depth as both the technique is less utilized in clinical practice and less available in lung function testing labs and as some results deserve more explanation (why do the R5 keep on growing through time while X5 at 12 month seems to be comparable to X5 at 1 month in the COVID-19 survivor group? This pattern seems to be more related to changes in central airways rather than small airways as stated in the discussion). See for example Veneroni C, Perissin R, Di Marco F, et al. Home monitoring of lung mechanics by oscillometry before, during and after severe COVID-19 disease: a case study. ERJ Open Res 2023.

Reply: The discussion section was revised per your suggestion. We added more discussion about a significant fluctuation of the PFT data in control group in the discussion section. Revised manuscript in the discussion section page no.11, line 239-244, highlighted. We added more discussion about IOS results in the discussion section. Revised manuscript in the discussion section page no.11-12, line 245-266, highlighted. We also added the limitation of

IOS using in some clinical setting in the discussion section. Revised manuscript in the discussion section page no.14, line 305-307, highlighted.

5. Language: written English could be improved.

Reply: Our manuscript was edited by a native English speaker.