



Letter to the Editor concerning: pulmonary artery trunk enlargement on admission as a predictor of mortality in in-hospital patients with COVID-19

Luis Carlos Lozano-Carrillo¹ · Yenitseh Ana Karen Hernández-Garate¹ · Alejandro Quiroga-Garza¹ · Rodrigo Enrique Elizondo-Omaña¹ · Santos Guzman-Lopez¹ 

Received: 21 June 2021 / Accepted: 2 July 2021 / Published online: 15 July 2021
© Japan Radiological Society 2021

Dr. Guang-Bin Wang,

We sincerely applaud the work done by Zhu et al. [1] in which they analyze the morphometric changes of the pulmonary artery trunk as a possible mortality predictor in COVID-19 patients. This work provides evidence with a multivariate analysis of the prognosis of COVID-19 patients according to anatomical characteristics and their correlation to the pathology. Its results can be extrapolated as a valuable tool for determining mortality risk by medical professionals and improve resource and treatment administration.

Anatomical characteristics play an important part in the clinical scenarios. This study was well-designed potentiating its validity and provides important information concerning diagnostic tools for COVID-19. However, it is important to stratify the sample populations by age groups and body mass complexion. The history of physical activities should also be considered to determine prognosis and outcome.

Another parameter to consider is the normal diameter of the pulmonary trunk for readers to know the difference in patients with COVID-19 and without it. The pulmonary trunk may have anatomical variations in different populations. For example, Yildiz et al. conclude that a diameter of the PA > 31 mm is an independent risk factor for mortality [2]. Physiological changes should also be considered. The mean diameter of the pulmonary artery was 28.3 mm in systole, and 22.9 mm in diastole in healthy men 20 to 29 years of age, in the study performed by Burman et al. [3]. Furthermore, this parameter will also determine how

much of your population in danger. The current study also mentions patients with 33.2 mm in their pulmonary trunk diameter at the day of admission were related to survival versus the 25.2 mm in non-survival patients. However, in the results a diameter > 29 mm was set as a significant predictor of subsequent death in COVID-19 patients with severe disease. Could the cut-off point please be clarified as well as how severe disease was defined? A valuable observation described was the presence of pulmonary embolism, which can cause distension of the pulmonary artery in hospitalized patients, however, it was not clearly defined if the increase in diameter was before the embolism, or as a cause of it, and how many of the patients had a satisfactory recovery.

The discussion mentioned myocarditis and coagulopathy with an increased diameter of the PA and associated with COVID-19 infection predict a more unfavorable prognosis. However, the results do not mention how many of the patients studied presented these complications and the relationship they have is omitted. It would be helpful to know if the study being purely anatomical was a limitation and reduced the applications. Including symptoms and laboratory values related to inflammation, could provide valuable data in a similar study, such as this one reported by Aleksova et al. [4].

References

1. Zhu QQ, Gong T, Huang GQ, Niu ZF, Yue T, Xu FY, Chen C, Wang GB. Pulmonary artery trunk enlargement on admission as a predictor of mortality in in-hospital patients with COVID-19. *Jpn J Radiol.* 2021;39:589–97. <https://doi.org/10.1007/s11604-021-01094-9>.
2. Yildiz M, Yadigar S, Yildiz BŞ, Aladag NB, Keskin O, Ozer RS, Topel C, Kahraman S. Evaluation of the relationship between COVID-19 pneumonia severity and pulmonary artery diameter

✉ Santos Guzman-Lopez
dr.santos.anato@gmail.com

¹ School of Medicine, Human Anatomy Department, Universidad Autonoma de Nuevo Leon, Ave. Madero y Dr. Eduardo Aguirre Pequeño s/n, Col. Mitras Centro, 64460 Monterrey, Nuevo León, México

- measurement. *Herz*. 2021;46(1):56–62. <https://doi.org/10.1007/s00059-020-05014-x>.
3. Burman ED, Keegan J, Kilner PJ. Pulmonary artery diameters, cross sectional areas and area changes measured by cine cardiovascular magnetic resonance in healthy volunteers. *J Cardiovasc Magn Reson*. 2016;18:12. <https://doi.org/10.1186/s12968-016-0230-9>.
 4. Aleksova A, Gagno G, Sinagra G, Beltrami AP, Janjusevic M, Ippolito G, Zumla A, Fluca AL, Ferro F. Effects of SARS-CoV-2 on cardiovascular system: the dual role of angiotensin-converting enzyme 2 (ACE2) as the virus receptor and homeostasis regulator-review. *Int J Mol Sci*. 2021;22(9):4526. <https://doi.org/10.3390/ijms22094526>.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.