

Clarification on Pleural Effusions in COVID-19

Avinash Aujayeb

Respiratory and Acute Medicine Consultant

Northumbria HealthCare NHS Foundation Trust

Care of Tracy Groom, Northumbria Way, Cramlington, Northumberland, NE23 6NZ, United Kingdom

Email: avinash.aujayeb@nhct.nhs.uk

Contributorship: A.A. wrote the whole manuscript.

Funding: There are no funders to report for this submission.

Competing interests: There are no competing interests for any author.

Manuscript type: letter to the editor

Editor:

We thank Tabatabaei et al for their recent paper on CT characteristics of 120 patients with COVID-19 with a wide range of clinical outcomes (1). 12.5% (19/96) of ward patients, 45% (9/11) of those in intensive care, and 23% (3/13) of those deceased had pleural effusions. The authors rightly mention that the incidence of pleural effusions is out of keeping with other published studies that pleural effusions are uncommon in COVID-19 (2). Therefore, we must dispute this finding in the absence of further explanations. It would be important to know if the effusions were unilateral or bilateral, whether those patients had any co-existing co-morbidities such as concurrent heart, renal, or liver failure or any disseminated malignancies, which are by far the most common cause of pleural effusions, and more importantly whether any of those effusions were sampled and what were the resultant biochemical and microbiological characteristics. So far, in the literature, there is only one report of pleural effusions in deceased COVID-19 patients being positive for the virus (3). However, patient characteristics in that study are also not described. We run a large pleural service in the North East of England, and this would greatly inform local and national practice (4). Current British Thoracic Society guidance suggests that all pleural procedures are potentially aerosol generating and could spread the virus, but the statement mentions that the evidence is poor (5). We believe the case series will be greatly enhanced if the details above are provided. If they cannot be provided, perhaps a note of caution should be added to the article by way of reply to this letter? We would also welcome any chance of international collaboration on the matter.

References

1. Tabatabaei ISMH, Talari H, Moghaddas F and Rajebi H Computed Tomographic Features and Short-term Prognosis of Coronavirus Disease 2019 (COVID-19) Pneumonia: A Single-Center Study from Kashan Radiol Cardiothorac Imaging 2020 2:2;e200130.
<https://doi.org/10.1148/ryct.2020200130>
2. Ng MY, Lee EYP, Yang J, Yang F, Li X, Wang H, Lui MM, Lo CS, Leung B, Khong PL, Hui CKM, Yuen K and Kuo MD Imaging Profile of the COVID-19 Infection: Radiologic Findings and Literature Review Radiol Cardiothorac Imaging 2020 2:1;e200034.
<https://doi.org/10.1148/ryct.2020200034>
3. Schaller T, Hirschtbühl K, Burkhardt K, Braun G, Trepel M, Märkl B, Claus R Postmortem Examination of Patients With COVID-19. JAMA. Published online May 21, 2020.
10.1001/jama.2020.8907
4. Aujayeb A, Parker S, Bourke S, Miller J and Cooper D A review of a pleural service. J R Coll Physicians Edinb 2016;46:26–31 <http://dx.doi.org/10.4997/JRCPE.2016.108>
5. British Thoracic Society. COVID-19: information for the respiratory community. <https://brit-thoracic.org.uk/about-us/covid-19-information-for-the-respiratory-community> Accessed May 22, 2020.

Response:

Seyed Mohammad Hossein Tabatabaei¹, MD; Hamidreza Talari¹, MD; Fahimeh Moghaddas², MD; Hamid Rajebi³, MD

1. Department of Radiology, Kashan University of Medical Sciences, Kashan, Iran
2. Department of Psychiatry, Kashan University of Medical Sciences, Kashan, Iran
3. Department of Radiology, University of Texas Health at San Antonio, San Antonio, Texas, USA

Hamid Rajebi

Address: Department of Radiology, University of Texas Health at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX, 78229

Email: hamid.rajebi@gmail.com

Manuscript type: Letter to the Editor

Conflict of interest

The authors declare no conflict of interest. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

We would like to thank the authors for their professional comments [1] on our article [2], and greatly appreciate their suggestions.

In our study, a total of 20 patients (out of the 120 patients) had pleural effusion (PE), of which twelve belonged to the routine hospitalization group, five to the ICU group, and three to the mortality group. A total of twelve patients had bilateral pleural effusion. In 16 of the 20 patients, pleural effusion was trace to small, and four had moderate pleural effusion. Of the four patients with moderate pleural effusion, three had history of congestive heart failure (CHF) and one had no underlying disease but very extensive (> 80%) lung parenchymal involvement. One of the patients with moderate pleural effusion underwent diagnostic thoracentesis, which showed serous fluid with no microbial growth. Of the 12 patients with pleural effusion who were admitted to the routine ward, two had diabetes mellitus (DM) and one had CHF. Of the five patients in the ICU group, one had CHF and, one had chronic renal failure and DM. Of the three patients who had died, one had CHF and one had DM. It is worth mentioning that pleural effusion occurs more commonly in diabetic patients, especially in the setting of community-acquired pneumonia [3].

The reported prevalence of pleural effusion in COVID-19 pneumonia has been variable in recently published investigations [4]. All the 120 patients in our study were inpatients with more pronounced symptoms than outpatients, which can explain the higher prevalence of pleural effusion than other studies. According to the study by Shi et al [5], the prevalence of pleural effusion varies depending on the stage of the disease, with a reported prevalence of 13% in the third week after symptoms onset. Pleural effusion may also be predictive of a worse prognosis and can indicate bacterial superinfection in COVID-19 [4].

In conclusion, it seems that an accurate comment on the prevalence and etiology of pleural effusion in COVID-19 infection should be based on the presence or absence of underlying medical conditions, study setting, disease stage, and concurrent superimposed bacterial pneumonia. Hence, the presence of pleural effusion cannot always be solely attributed to COVID-19 pneumonia.

References

1. Aujayeb, A. Clarification on Pleural Effusions in COVID-19. *Radiol Cardiothoracic Imaging* 2(3):e200330.
2. Tabatabaei SMH, Talari H, Moghaddas F, Rajebi H. Computed Tomographic Features and Short-term Prognosis of Coronavirus Disease 2019 (COVID-19) Pneumonia: A Single-Center Study from Kashan, Iran. *Radiol Cardiothoracic Imaging* 2020 Apr 20;2(2): e200130. DOI: <https://doi.org/10.1148/ryct.2020200130>
3. Falguera M, Pifarre R, Martin A, Sheikh A, Moreno A. Etiology and outcome of community-acquired pneumonia in patients with diabetes mellitus. *Chest*. 2005 Nov 1;128(5):3233-9. DOI: <https://doi.org/10.1378/chest.128.5.3233>
4. Ye Z, Zhang Y, Wang Y, Huang Z, Song B. Chest CT manifestations of new coronavirus disease 2019 (COVID-19): a pictorial review. *European Radiology*. 2020 Mar 19:1-9. DOI: <https://doi.org/10.1007/s00330-020-06801-0>
5. Shi H, Han X, Jiang N, Cao Y, Alwalid O, Gu J, Fan Y, Zheng C. Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study. *The Lancet Infectious Diseases*. 2020 Feb 24. DOI: [https://doi.org/10.1016/S1473-3099\(20\)30086-4](https://doi.org/10.1016/S1473-3099(20)30086-4)