

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Annals of Medicine and Surgery

journal homepage: www.elsevier.com/locate/amsu

Correspondence

Barotrauma in covid - Causes and consequences

Pradipta Bhakta^{a,*}, Habib Md Rezaul Karim^b, Mohanchandra Mandal^c, Brian O'Brien^d, Antonio M. Esquinas^e^a Department of Anaesthesiology and Intensive Care, University Hospital Kerry, Tralee, Co, Kerry, Ireland^b Department of Anaesthesiology and Critical Care, All India Institute of Medical Sciences, Raipur, India^c Department of Anaesthesiology and Intensive Care, Institute of Postgraduate Medical Education and Research, Seth Sukhlal Karnani Memorial Hospital, Kolkata, West Bengal, India^d Department of Anaesthesiology and Intensive Care, Cork University Hospital, Cork, Ireland^e Department of Intensive Care, Hospital Morales Meseguer, Murcia, Spain

ARTICLE INFO

Keywords:

Barotrauma

Invasive mechanical ventilation

Covid-19 patients

Dear Editor,

In a retrospective case series of Covid-19 patients, Edwards et al. define barotrauma as the presence of 'extrapulmonary air' on chest X-ray (CXR) [1]. Clearly, one would include the occurrence of pneumo-pericardium within that category [2]. We note its presence on one of their images although it was not described as such. In using CXR to detect barotrauma, it of course has lower sensitivity and specificity than computerized tomographic (CT) imaging. Thus their dataset, though large, may underestimate the true risk of barotrauma. While it may not be always possible to routinely use CT imaging, perhaps ultrasound might have detected more, or better characterized known, cases [3].

Furthermore, although the authors reported following Acute Respiratory Distress Syndrome Network protocols in treating patients, the data shown in table 3 is at times inconsistent with that approach. In patients with chronic obstructive pulmonary disease and asthma, additional information on plateau and driving pressure, or airway resistance, better reflects the risk of barotrauma than peak or mean airway pressure (Ppeak, Pmean) [4]. Notably, some patients who developed pneumothorax had received lower positive end-expiratory pressure (PEEP), Ppeak, and Pmean. Therefore, it is crucial to know whether Peak, Pmean, and PEEP levels differed between those who did, and those who did not, suffer barotrauma [4,5].

Finally, and importantly, we wonder if barotrauma was associated with more severe COVID-19 infection (as measured by C-reactive

protein, lymphopenia, D-dimer, or viral load, for example) at presentation, or in terms of their overall clinical course. We would also inquire whether their sedation, muscle relaxant, and prone positioning requirements during mechanical ventilation differed from other patients, as crude markers of disease severity.

We thank the authors' for this useful study, and would greatly welcome clarification on the above issues.

Financial support

No funding other than personal was used in conducting the audit as well as writing the manuscript. We declare that we have no financial and/or personal relationships with other people or organizations that could inappropriately influence (bias) our work.

Ethical approval

Not applicable.

Consent

Not necessary as this is mere correspondence to published article in your journal.

* Corresponding author. Department of Anaesthesiology and Intensive Care, University Hospital Kerry, Tralee, Co, Kerry, Ireland.

E-mail addresses: bhaktadr@hotmail.com (P. Bhakta), drhabibkarim@gmail.com (H.M. Rezaul Karim), drmcmandal@gmail.com (M. Mandal), drbrien@hotmail.com (B. O'Brien), antmesquinas@gmail.com (A.M. Esquinas).

<https://doi.org/10.1016/j.amsu.2021.102189>

Received 2 February 2021; Accepted 17 February 2021

Available online 4 March 2021

2049-0801/© 2021 The Author(s). Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Author contribution

1. **Dr. Pradipta Bhakta:** Was involved analysis of the article, writing and editing the letter.
2. **Dr. Habib Md Rezaul Karim:** Was involved analysis of the article, writing and editing the letter.
3. **Dr. Mohanchandra Mandal:** Was involved analysis of the article, writing and editing the letter.
4. **Dr. Brian O'Brien:** Was involved analysis of the article, writing and editing the letter.
5. **Dr. Antonio M. Esquinas:** Was involved analysis of the article, writing and editing the letter.

Registration of research studies

1. Name of the registry: Not Applicable
2. Unique Identifying number or registration ID: Not Applicable
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): Not Applicable

Guarantor

Dr. Pradipta Bhakta, Consultant, Department of Anaesthesiology and

Intensive Care, University Hospital Kerry, Tralee, Co: Kerry, Ireland.
Email: bhaktadr@hotmail.com.

Declaration of competing interest

The authors report no conflicts of interest.

References

- [1] J.A. Edwards, I. Breitman, J. Bienstock, et al., Pulmonary barotrauma in mechanically ventilated coronavirus disease 2019 patients: a case series, *Ann Med Surg (Lond)*. 61 (2020 Nov 28) 24–29, <https://doi.org/10.1016/j.amsu.2020.11.054.eCollection.2021.Jan>.
- [2] P. Bhakta, J.R. McNamara, B. O'Brien, R. Plant, Isolated pneumopericardium caused by positive pressure ventilation: a rare complication, *J. Clin. Anesth.* 49 (2018) 5–6.
- [3] K.K. Chan, D.A. Joo, A.D. McRae, Y. Takwoingi, Z.A. Premji, E. Lang, A. Wakai, Chest ultrasonography versus supine chest radiography for diagnosis of pneumothorax in trauma patients in the emergency department, *Cochrane Database Syst. Rev.* 7 (7) (2020 Jul 23) CD013031.
- [4] G. Ioannidis, G. Lazaridis, S. Baka, I. Mpoukovanas, V. Karavasilis, S. Lampaki, et al., Barotrauma and pneumothorax, *J. Thorac. Dis.* 7 (Suppl 1) (2015) S38–S43.
- [5] D.H.L. Lemmers, M. Abu Hilal, C. Bnà, et al., Pneumomediastinum and subcutaneous emphysema in COVID-19: barotrauma or lung frailty? *ERJ Open Res* 6 (4) (2020) 385–2020.