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## Ultrasonography in Chronic Obstructive Pulmonary Disease: Fact or Fiction?

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Sir,

We read with interest the paper by Jain *et al.* titled “Study of the diaphragm in chronic obstructive pulmonary disease using ultrasonography.”<sup>[1]</sup>

This cross-sectional study included 48 chronic obstructive pulmonary disease (COPD) patients with 20 age-matched controls. They showed that the diaphragm thickness, movement, and zone of apposition were significantly reduced in mild-to-moderate COPD but increased in severe COPD.

The use of ultrasound to measure diaphragmatic dysfunction in COPD patients holds exciting promise in COPD management. The value of the findings would be more rigorous if some important variables were reported. Limited demographic and clinical data were available which, therefore make their result difficult to interpret and ultimately make it less generalizable. It was interesting to know the actual pulmonary function results, smoking history, presence of comorbidities, and anthropometric data as these factors can contribute to diaphragm dysfunction in COPD.<sup>[2]</sup>

The examinations procedure for their study was not presented in the methodology section to show how these measurements were taken, which highlights a major concern. The conflicting results to Corbellini *et al.*, 2018 could be explained by the confounding variables that influence the overall outcome.<sup>[3]</sup>

In the future, the inclusion of COPD phenotypes could add further understanding to their results. The severity of emphysema can play a major role in the abnormal motion of the diaphragm.<sup>[4]</sup> Therefore, patients with chronic bronchitis and frequent exacerbator phenotypes could have different responses when compared to emphysematous phenotype, and such differences should be considered in these measurements.<sup>[5,6]</sup>

In its current format with thanks to the authors, this paper leaves us with two important unanswered questions. (1) What would be the differences in the diaphragm thickness, movement, and zone of apposition among different COPD phenotypes? (2) Does airflow severity in COPD have a strong correlation to the diaphragmatic

dysfunction that independent of emphysematous phenotype?

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### Conflicts of interest

There are no conflicts of interest.

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