Assessing the flat diaphragm in chronic obstructive pulmonary disease: Deep-diving is a better approach

Sir,

We read the article titled, "Study of the diaphragm in chronic obstructive pulmonary disease using ultrasonography"[1] published in *Lung India* with great interest. Sonographic assessment of the diaphragm is a specialized and relatively less explored domain in ultrasonography (USG) requiring an experienced operator. While it is heartening to note that sonographic assessment of the diaphragm in chronic obstructive pulmonary disease (COPD) is being embraced by pulmonologists, we wish to highlight certain concerns that the study has raised. We found the following ambiguous areas in the article.

The article does not meet the criteria laid down in the "STROBE guidelines" for reporting observational studies, as the authors fail to state the aims of study, inclusion and exclusion criteria, criteria to enroll controls, basis of sample size, or the statistical methods used to analyze the data.

We found the methodology sketchy as the procedure for diaphragm assessment (probe and mode used, patient position, and calculations used) and the operator (pulmonologist or radiologist) were not detailed. Standardized measures such as thickening fraction would have been better than "change in diaphragm thickness." Zone of apposition (ZoA) was defined as "the area where the abdominal contents meet the lower rib cage," while the precise description of ZoA is "the area of muscle fibers vertically oriented, in contact with the chest wall."[2]

The presentation of the results is also ambiguous. Diaphragm changes are "correlated" with pulmonary function and modified Medical Research Council (mMRC) dyspnea, wherein statistical correlations are not derived. The severity of COPD is referred to as Grade A, B, and C. If the authors are referring to the ABCD groups of COPD, lack of patients in Group D is surprising given the severity of airflow obstruction and mMRC dyspnea. Besides, it has been reported in this study that diaphragm movement and thickness increased with increasing severity of COPD, which indicates better diaphragm function. It is indeed difficult to fathom how diaphragm function can "improve" with worsening COPD, when all reported literature and common knowledge are to the contrary.[3-5]

In summary, the present paper is fraught with methodological, factual, and probably procedure-related errors. In view of this, the need to undertake and report a well-structured and executed study that truly corroborates the use of USG in diaphragm assessment in COPD has become imminent.

It is our sincere hope that standard checklists will be enforced by the publishing community and reviewers of widely read journals to ensure that all relevant aspects of research are reported in a scientific manner.

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Conflicts of interest
There are no conflicts of interest.

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