

# Promoting the inclusion of vital-capacity data in the bronchodilator response

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## Dear editor

I read with interest the manuscript of Torén et al<sup>1</sup> asking for a change in the interpreting way of the reversibility test. The authors have opted for a difference between the predicted normal values after and before bronchodilation (ABD, BBD, respectively).<sup>1</sup> They have included three spirometric data (forced expiratory volume in the first second [FEV<sub>1</sub>], forced vital capacity [FVC] and slow vital capacity [SVC]), and they have proposed three thresholds to be significant at 9, 4 and 6%, respectively, for FEV<sub>1</sub>, FVC and SVC. Such papers are encouraged since vital-capacity (FVC and SVC) data are still “neglected” by the Global Obstructive Lung Disease (GOLD).<sup>2</sup> Moreover, in the GOLD 2017 Report, it was clearly stated that “assessing the degree of reversibility of airflow limitation does not aid the diagnosis of COPD, differentiate COPD from asthma, or predict the long-term response to treatment.” However, the following three points should be highlighted:

Point 1 concerns the expression of ABD data in units of percentage predicted normal. This method could be a source of confusion for clinicians. First, almost all the spirometric norms were established for BBD data, and up to day, only two ABD spirometric norms were published.<sup>3,4</sup> It appears that the use of BBD instead of ABD reference values gives 3.2% of false-negative diagnosis of airflow obstruction.<sup>4</sup> Second, it seems that ABD prediction equations gave higher predicted spirometric data than existing BBD equations and that bronchodilators’ (BD) response decreased with age.<sup>3</sup> So for that reason, to better understand how patients with chronic respiratory conditions respond to BDs, it will be more helpful to derive ABD norms from healthy and sick subjects.<sup>5</sup>

Point 2 concerns the inclusion of FVC and SVC as clinical outcomes measure of BD reversibility. This forgotten message from GOLD<sup>2</sup> should be promoted from now on. First, the acute FVC response to BD was significantly correlated with numerous health-related quality-of-life items and activities of daily living, which was not the case for the FEV<sub>1</sub> response.<sup>5</sup> Second, an improvement in FVC provides useful information about the function of small airways, the most important sites of inflammatory and remodeling processes that are difficult to measure.<sup>5</sup> Third, the assessment of vital-capacity data was proposed as a means to obtain additional information regarding hyperinflation.<sup>5</sup>

Point 3 concerns the extent of the BD response of the 100 patients with a “likely” mild COPD (their ABD FEV<sub>1</sub> mean was 86%).<sup>1</sup> Comparison with a subgroup of 92 stable COPD patients (GOLD I and II) aged 63 years<sup>5</sup> found similar data expressed either in absolute terms in mL ( $\Delta$ FVC: 209±261 vs 220±280<sup>5</sup>;  $\Delta$ FEV<sub>1</sub>: 170±177 vs 160±160<sup>5</sup>) or as a percentage of the baseline values (% $\Delta$ FVC: 6.0±7.7 vs 8.0±11.0<sup>5</sup>; % $\Delta$ FEV<sub>1</sub>: 7.3±7.6 vs 9.0±10.0<sup>5</sup>). However, comparison with a subgroup of 76 COPD

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patients (GOLD III and IV)<sup>5</sup> found different results concerning  $\Delta$ FVC ( $330\pm 210$  mL),  $\Delta$ FEV<sub>1</sub> ( $110\pm 120$  mL), % $\Delta$ FVC ( $18\pm 13$ ) and % $\Delta$ FEV<sub>1</sub> ( $13\pm 13$ ).<sup>5</sup> It appears that the BD response was clinically significant in the more severe sub-population than in the less severe one.

In conclusion, in daily practice, reversibility should be identified using the changes not only in FEV<sub>1</sub> but also those of static volumes. Sufficient evidence is now available to justify the promotion of this message.

## Disclosure

The author reports no conflicts of interest in this communication.

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## Author reply

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## Dear editor

We appreciate the comments by Dr Ben Saad and take the opportunity to add a few remarks: 1) The difference between

the values after bronchodilatation (% predicted normal) minus the value before bronchodilatation (% predicted normal) is rather insensitive to the particular reference equation applied to calculate the predicted normal. 2) The final conclusion by Dr Ben Saad that forced vital capacity and slow vital capacity should be included when assessing the effect of bronchodilatation is quite in line with our opinion.

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