patients with moderate to severe COPD (36% of moderate to 76% of very severe patients) [3]. In my group's own studies, we found that the presence of the paradoxical movement of the lower ribcage was independently associated with a higher degree of dyspnoea (both at rest and after exercise) and higher use of health resources, including hospitalisations [4]. For this reason, we proposed the inclusion of this sign among the data useful for predicting outcomes in COPD [5].

The paper by ALIVERTI *et al.* [1] adds interesting information and reinforces the usefulness of including this frequently forgotten sign in the physical examination of COPD patients.

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From the authors:

We thank E. Garcia-Pachon for his interest in our paper. We are familiar with his previous work, which showed a relationship between the presence of Hoover's sign detected clinically and some measures of the severity of chronic obstructive

pulmonary disease (COPD), such as dyspnoea and hospitalisation rate [1].

Our previously published paper [2] proposed a new method for quantitative description of lower ribcage paradoxical motion and showed a clear relationship between the degree of paradox at rest, operational chest wall volume changes and symptoms during exercise. This approach allowed us to define objectively what was being measured and relate this measurement to clinically relevant outcomes, such as the pattern of chest wall dynamic hyperinflation and the symptoms that limit exercise.

Before proposing these quantitative descriptors as an independent parameter and therefore as an aid for diagnosis in COPD, a number of issues are still to be determined in a larger population of COPD patients. These include the relationship of paradoxical lower ribcage movement to more traditional pulmonary function tests, the correlation with clinical detection of Hoover's sign in different postures, and the role played by the diaphragm and abdominal muscles in the generation of the asynchrony. The availability of objective measurements such as the one we describe should help us better understand the physiological basis that underpins Hoover's sign and help extend its use in everyday clinical practice.

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