Reviewer's report

Title: Non specific pattern of lung function in a respiratory physiology unit: causes and prevalence: results of an observational cross-sectional and longitudinal study

Version: 2  Date: 2 June 2014

Reviewer: Paul Scanlon

Reviewer's report:

Major:
1) In the original description by Hyatt et al, it was noted that although obstructive disorders constitute a majority of cases of the nonspecific pattern, a minority consist of non-obstructive disorders. These include obesity, muscle weakness, other forms of chest wall limitation, and heart failure. I would suggest you address some composite of these in defining the frequency of disorders, lest your readers think this can only be caused by obstruction. Further, I would point out in your discussion that chest wall limitation, whether due to weakness, obesity, pleural disease, or other anatomic limitation (e.g. scoliosis) can cause the nonspecific pattern in the clear absence of airway obstruction.

2) Results, Paragraph 2 - it is not sufficiently clear from your description how you narrowed the 360 patients with key diagnoses down to 185, or if that is a valid selection process. Please describe and justify further.

3) Obesity seems to be less prevalent in your patients than in Hyatt's. However, there is no attempt to describe the prevalence of obesity among your 12,775 cohort, nor the 841 with NSP, nor the selected groups of 360 or 185, however they were selected. Differences between Europe and North America are important in this regard, and may be the main reason for the slightly lower prevalence of the NSP among your patients. Please address this major issue.

Discussion, paragraph 7: Is it true that patients were only included in your analysis if interpreting physicians identified them as such at the time of interpretation? That seem open to a large number of patients being misidentified as obstruction or restriction, particularly with the vagaries of different interpreting physicians. This could totally bias your estimate of the prevalence of the NSP to an inappropriately low value.

Conclusion: Although plethysmographic lung volumes can be enlightening, I believe it is an overstatement that plethysmographic lung volumes, an expensive test, is mandatory when FVC and FEV1 are reduced. While the availability of accurate lung volumes may prevent the incorrect impression of a restrictive disorder in those who turn out to have the NSP, the need for such information varies depending on previous measurements, lung imaging, and clinical judgment. If resources or time are limited, measurement of maximal respiratory pressures may sometimes be considerably more valuable.

Minor
Materials and Methods:

1) Please provide reference for "RECORD" or explain.

2) Design, Paragraph 1, end - you describe what has recently been called a "complex restrictive pattern" (Dykstra et al, at both World Chest Congress and ATS, 2014). It is not the same as a mixed obstructive/restrictive disorder which is described in the 2005 ATS/ERS Interpretive Standard and requires a reduced FEV1/FVC ratio.

3) Design, second to last paragraph - have you measured the inter-device variation in measurements between your two systems? How does that affect repeat measures? Viasys is now part of CareFusion.

Statistics: I would include the methods detailed in Table 2.

Results, Paragraph 2: among English speakers, the term "hyperinflation" is usually applied to instances of significant increase in TLC, whereas increased RV or FRC is usually called "air trapping". Neither term is defined in the ATS/ERS interpretive Standards paper, so older references must be used. It should be noted, first, that increased RV is virtually universal in the non-specific pattern (see Table 1 in Hyatt). It should also be noted, as above, that this may be due to either airflow obstruction or, less commonly, due to chest wall limitation.

Discussion, end of Para 5: Do you ever measure airway resistance in patients with NSP? Our technicians routinely identify patients with NSP and, following a clinical laboratory protocol, and measure Raw when the NSP is identified. In non-published data, we find that only about half of patient with NSP have increased Raw.

Discretionary:

Intro, para 1, line 13 - "..the other depicted..." could be better stated as "...the others suffered from..."

Results, Para 2: "Asthmatics depicted..." could be better stated "Asthmatics demonstrated..."

Follow-up, paragraph 1, line 4: How long was the mean interval of follow-up? Substitute "demonstrated" for "depicted".

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

No competing financial interests.