Reviewer's report

Title: Considerations in the use of different spirometers in epidemiological studies

Version: 0 Date: 06 Dec 2018

Reviewer: Giovanni Viegi

Reviewer's report:

GENERAL COMMENT

The manuscript aims at assessing comparability between measurements obtained by different spirometers in two series of 49 children. In general, the manuscript is well written and is of interest, but there are some issues that should be dealt with by the Authors.

MAJOR COMMENTS

Methods

Page 4, lines 56-58: It seems that anthropometric data were not objectively measured but only asked to the studied subjects. If this is the case, advantages (if any) and limitations of such a method should be discussed.

Page 6, lines 7 - 15: this procedure is based on some assumptions which might turn to be undemonstrated. First, the Authors report that their 49 volunteers were "healthy", possibly meaning that they were disease- and symptom-free. However, no information is provided on individual characteristics, including environmental exposures. Other assumptions are cited in the comments to Discussion.

Discussion

Page 8 - lines 15-25: It would be worthwhile to quote also other approaches to assessment of quality of spirometry test performance (e.g. Enright PL et al, Am Rev Respir Dis. 1991; Enright PL et al, Chest. 2000) and to inter-laboratory comparison of spirometry measurements in international epidemiological studies (e.g. Viegi G et al, Respir Med 2000)

Page 8 - lines 27-40: However, there are some papers in the literature showing that the GLI equations may not be suitable for all the populations (e.g. in North Africa, Ben Saad H et al, Respir Med 2013; in Sweden, Backman H et al, BMC Pulm Med. 2015; in Italy, Fasola S et al, Respir Med 2017). It would be useful to check the applicability of GLI equations in the Netherlands, before making the assumption that they are a gold standard.
two different technicians performed the first test series, one for the Masterscreen and one for the EasyOne. Even if they were both well-trained, this might represent an important source of bias, since it is unclear if the observed differences have to be ascribed to the spirometer or the technician. Moreover, it is not possible to adjust for the technician effect, since the two factors "spirometer" and "technician" are perfectly associated. The fact that two different technicians performed the Masterscreen and the EasyOne measurements need to be explicited in the Methods, and the consequent risk of bias clearly highlighted in the Discussion as a study limitation.

SPECIFIC COMMENTS

- Abstract, line 15; page 4, line 5; page 6, line 18: technically speaking, the Authors have not "computed a correction factor", but they have rather provided a "correction equation".

- Page 4, line 50: there is a missing open parenthesis before "… n=4 for each of the two series)".

- Page 5, line 13: Yorba Linda, not Yoba Linda

- Page 6, line 53: the percentage differences should be better explained:

  6.3% appears to derive from $100(1-3.54/3.78)$ (% decrease switching from Masterscreen to EasyOne);
  8.4% appears to derive from $100(4.78/4.41-1)$ (% increase switching from EasyOne to Masterscreen)

  Similarly, 1.15% and 0.9% are % increase switching from EasyOne2 to EasyOne1.

- Page 8, line 13: ". Measurements were comparable." However, with a systematic significant difference.

- Page 8, line 40: are the Authors able to ascertain if the study population falls under GLI 2012 database?

- Page 10, line 5: However, a formal computation of the sample size to test the hypothesis would be useful.

- Page 10, line 6: before the Conclusion, the Authors should also underline the study limitations, such as potential bias due to technician effect, lack of assessment of external validity of the proposed correction method.

- Page 10, lines 16-17: It should also be pointed out that a correction may be important also for estimating prevalence rates of airflow obstruction in a population when different spirometers are used in different occasions (see, for instance, Maio S et al, Respir Med 2016).
Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal