Pulmonology 000 (xxxx) 1

PULMONOLOGY

www.journalpulmonology.org

LETTER TO THE EDITOR

'Gold-standard' field test is a non-sequitur

We read with interest the letter by Combret and colleagues[1] describing the 6-min walk test (6MWT) as the 'gold standard' field test for the evaluation of exercise capacity. The study population described by Combret's group is of young people with cystic fibrosis (CF) with mean age 12 years, and near-normal lung function (mean FEV_1 95.8% predicted). It would be our opinion that a 6MWT would be of limited utility in evaluating exercise capacity in a group of healthy children with CF – it is a non-externally paced, non-incremental, volitional test that is sub-maximal for all barring those with advanced lung disease.

Indeed, mean (SD) end-exercise heart rate (HR) was 126 (24) beats.min^{-1} in the children studied suggesting (very) low cardiorespiratory stress. Whilst we acknowledge the utility of the 6 MWT in people with CF undergoing transplant assessment and those with very low lung function, we would see no evidence to support the notion of the 6MWT being useful in the cohort described. Furthermore, the peak HR reported on 1-min sit-to-stand (1-min STS) testing [mean (SD) 116 (20) beats.min^{-1}] would lead us to question the motivation (internal and external) of the individuals tested. This is significantly lower than the achievement of an average HR of approximately 90% of the maximum HR measured during an exhaustive cycle cardiopulmonary exercise test on the 1-min STS that has been reported previously by other groups.[2,3]

We acknowledge that cardiopulmonary exercise testing with breath by breath gas analysis is not universally available. The next best test recommended in a joint statement endorsed by the European Respiratory Society and the European Cystic Fibrosis Society Exercise Working Group would be to perform a maximal workload test on a cycle ergometer with continuous measures of HR and oxygen saturation.[4] Such a test would be expected to achieve a near-maximal HR and detect any exercise related desaturation. There are some tests e.g. 25-level modified shuttle test (MST-25)[5] which are incremental, externally-paced, and do have the potential to measure maximal exercise in people with CF; these tests in our opinion would be better field tests than 6 MWT.

Perhaps most importantly no field test can be defined as 'gold standard' due to the lack of precision in understanding whether exercise limitation is physiological or volitional.

Declaration of Competing Interest

The authors have no conflicts of interest to declare.

References

1. Combret Y, Prieur G, Boujibar F, et al. Validity and reliability of the one-minute sit-to-stand test for the measurement of cardiorespiratory responses in children with cystic fibrosis. Pulmonology. 2022;28(2):137–9.
2. Radtke T, Puhan M, Hebestreit H, Kriemler S. The 1-min sit-to-stand test – A simple functional capacity test in cystic fibrosis? J Cyst Fibros. 2016;15(2):223–6.
3. Radtke T, Hebestreit H, Puhan M, et al. The 1-min sit-to-stand test in cystic fibrosis – Insights into cardiorespiratory responses. J Cyst Fibros. 2017;16(6):744–51.
4. Hebestreit H, Arets HGM, Aurora P, et al. Statement on exercise testing in cystic fibrosis. Respiration. 2015;90(4):322–51.
5. Elkins MR, Dentice RL, Bye PT. Validation of the MST-25: an extension of the modified shuttle test (MST). J Cyst Fibros. 2009;8(Supplement 2):S70.

D.S. Urquhart[a,b,*], H. Hebestreit[c], Z. Saynor[d], T. Radtke[e], on behalf of the European Cystic Fibrosis Society Exercise Working Group

[a] *Department of Paediatric Respiratory and Sleep Medicine, Royal Hospital for Children and Young People, Edinburgh, EH16 4TJ, United Kingdom*
[b] *Department of Child Life and Health, University of Edinburgh, United Kingdom*
[c] *Paediatric Department, University Hospitals Würzburg, Germany*
[d] *School of Sport, Health and Exercise Science, Faculty of Science and Health, University of Portsmouth, United Kingdom*
[e] *Epidemiology, Biostatistics and Prevention Institute, University of Zurich, Switzerland*

[*] Corresponding author at: Department of Paediatric Respiratory and Sleep Medicine, Royal Hospital for Children and Young People, Edinburgh, EH16 4TJ, United Kingdom.
E-mail address: don.urquhart@nhslothian.scot.nhs.uk (D.S. Urquhart).
Received 29 June 2022; Accepted 1 July 2022
Available online xxx

https://doi.org/10.1016/j.pulmoe.2022.07.016