Response: Value and Timing of Repeat Spirometry or FENO in Children With Asthma Remains Unclear

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To the Editor:

We thank Drs Yawn and Kaplan for their interest and comments on our article in which we describe a secondary analysis of data from seven published trials where fractional exhaled nitric oxide (Feno) was used to guide asthma treatment in children.1 We believe that our results offer relevance to clinicians attempting to interpret repeated measurements of spirometry and Feno. To the best of our knowledge, our analysis is the first to: (1) compare the clinical outcomes following a change in FEV1 and Feno over time; (2) compare clinical outcomes following absolute vs percent change in Feno; and (3) describe clinical outcomes following changes in FEV1 that fall within the range of "normal."

The rationale for reporting changes in FEV1 and Feno over a 3-month period vs outcomes in the following 3 months was purely due to the design of the trials whose data we used. Just because three monthly assessments are not feasible in some settings (as Drs Yawn and Kaplan suggest) does not mean that three monthly assessments might not be appropriate. Follow-up in some secondary care settings does occur at 3- to 4-month intervals, and our results will be relevant in this setting. Also, Feno is increasingly used with an associated cost, and our data provide novel data as to the change required to predict exacerbations and a comparison between the two objective tests.

We join Drs Yawn and Kaplan in wanting to know what interval should pass between objective respiratory physiological testing. To us, 12 monthly measurements are not frequent enough, and we know that in the context of Feno, daily measurements are not clinically helpful.2 The answer seems likely to be between monthly and every 6 months; this approach may change according to individual need.

Our correspondents also point out that it is unclear how many spirometric or Feno assessments are required to predict one exacerbation or loss of control in the next 3 to 6 months. Our study was not designed to answer this important health economic question.

Drs Yawn and Kaplan ask how assessing decline in FEV1 or increase in Feno would perform compared with just assessing asthma control. Asthma control was included in our model, meaning that any value of FEV1 and Feno was in addition to control. The answer to the question posed by the correspondents, “will adding spirometry or Feno improve this [knowledge of asthma control] predictive value?” is therefore “yes.”

References

1. S. Fielding, M. Pijenenburg, J.C. de Jongste, et al. Change in FEV1 and Feno measurements as predictors of future asthma outcomes in children. Chest, 155 (2) (2019), pp. 331-341
2. J.C. de Jongste, S. Carraro, W.C. Hop, CHARISM Study Group, E. Baraldi. Daily telemonitoring of exhaled nitric oxide and symptoms in the treatment of childhood asthma. Am J Respir Crit Care Med, 179 (2) (2009), pp. 93-97