

LETTER TO THE EDITOR

Breathlessness perception in children with asthmaGiorgio Ciprandi, MD¹, Maria Angela Tosca, MD², Michela Silvestri, MSc², and Giovanni Arturo Rossi, MD²¹Department of Medicine, IRCCS Azienda Ospedaliera Universitaria San Martino, Genoa, Italy and ²Department of Paediatrics, Pulmonary Disease and Allergy Unit, G. Gaslini Institute, Genoa, Italy

Dear Editor,

Nuijsink et al. [1] have evaluated school-aged children and adolescents with moderate atopic asthma to assess correlation between lung function and perception of bronchoconstriction, defined as expression of the slope of the relation between changes in forced expiratory volume in 1 s (FEV₁) after methacholine (MCH) challenge and Borg scores and as the Borg score at a 20% fall in FEV₁ from baseline during the provocation test [1]. They showed that poor symptom perception correlated with increased airway hyper-responsiveness (AHR) ($r=0.24$) and lower baseline pulmonary function (FEV₁) ($r=0.2$), and was associated with less use of rescue bronchodilators ($r=0.26$).

Interestingly, while evaluating school-aged children and adolescents with asthma, we recently provided evidence that a Visual Analogue Scale (VAS) could appropriately assess perception of breathlessness. We found a positive correlation between perception and lung function, including FEV₁ values <80% of predicted ($r=0.47$). In addition, VAS positively related with improvement of FEV₁ values in response to salbutamol ($r=0.49$) [3]. This is in direct contrast to findings by Nuijsink et al. [1] who used the Borg score during a provocation test to assess breathlessness whereas in our study VAS scores were used to evaluate bronchodilation as a marker for relief of breathlessness. These two different approaches likely account for the differences in clinical outcomes observed.

We believe that the study by Nuijsink et al. [1] raises some concerns. The definition of perception they used is rather complex and obscure, concerning both its definition and the model of bronchoconstriction considered. In fact, MCH challenge represents an experimental setting very far from the real life of children with asthma. Their study population seems to be heterogeneous in severity, since the inhaled corticosteroid dose used was very wide and only a group of children was also treated with long-acting bronchodilators. Lastly, the authors did not provide any information on the type of sensitization, the exposure to the causal allergen(s) and, probably most important, the degree of asthma control.

The authors stated that 28 out of 140 children had no AHR. It is unclear whether this was the result of complete asthma control resulting in low disease severity or due to effective treatment and adherence. The reported median FEV₁ value in the whole study population is surprisingly high for moderate asthma (98%). Moreover, there are no details about other spirometric parameters, including FVC, FEV₁/FVC ratio and FEF_{25–75} values. Reversibility was also not measured, or reported. If the study population is heterogeneous, possible differences in symptom perception should be evaluated separately in the different subgroups.

However, the main criticism concerns the final statement: “We propose that assessment of Borg scores could be a useful addition to routine bronchoprovocation testing in children”. The strength of a relationship has to be mainly calculated by its ‘ r ’ value. It is well known that values between 0.2 and 0.39 represent weak associations [4]. Given the r values provided by Nuijsink et al. [1] of ≤ 0.26 , we feel that their conclusions are based on weak methodology.

There is no doubt that assessing perception of bronchial symptoms is a relevant part in asthma management. Given the concerns listed above, it remains unclear whether the approach by Nuijsink et al. [1] can be considered a reliable tool. However, we have shown that VAS assessment of breathlessness can be a useful and reliable method in the management of childhood asthma.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

References

1. Nuijsink M, Hop W, de Jongste JC, Sterk PJ, Duiverman EJ, CATO Study Group. Perception of bronchoconstriction: a complementary disease marker in children with asthma. *J Asthma* 2013;50:560–564.
2. Tosca MA, Silvestri M, Olcese R, Pistorio A, Rossi GA, Ciprandi G. Breathlessness perception assessed by Visual Analogue Scale and lung function in children with asthma: a real-life study. *Ped Allergy Immunol* 2012;23:537–542.
3. Tosca MA, Silvestri M, Rossi GA, Ciprandi G. Perception of bronchodilation assessed by Visual Analogue Scale in children with asthma. *Allergol Immunopathol* 2012;pii:S0301-0546(12)00212-1.
4. Swinscow TDV. Statistics at square one, 9th edn. Revised by Campbell MJ, University of Southampton. London: BMJ Publishing; 1997.