

Correspondence

VCD and ILO are not synonymous

To the Editor:

The publication by Leong et al¹ synonymizes vocal cord dysfunction (VCD) and a neologism, inducible laryngeal obstruction (ILO). The function of the vocal cords during normal respiration is to abduct during inspiration to maximize air intake. One form of VCD involves paradoxical adduction during inspiration, resulting in obstruction to inspiratory airflow (Fig 1, A). Another type of VCD involves adduction during both inspiration and expiration, resulting in obstruction to airflow throughout the respiratory cycle (Fig 1, B).² Vocal cord activity corresponding to the flow-volume (FV) tracings in Fig 1 can be viewed and heard at the website <https://www.milesweinberger.com/copy-of-exercise-induced-dyspnea>.

Anatomically distinct masqueraders of VCD can result in similar FV tracings.³ An example is laryngomalacia, in which redundant tissue from arytenoids invaginate during high inspiratory flow during exercise. The treatment options for such imitators and VCD are obviously different.

ILO entered the lexicon in 2009. Robert Maat established a scoring system for exercise-induced laryngeal movement during continuous laryngeal observation,⁴ a methodology that has since been used by others.⁵ Scores from zero to 3 were given for extent of medial rotation of the aryepiglottic folds and adduction of the vocal cords. Although correlation of subjective symptoms with laryngeal movements was described, there was no measure of actual obstruction to airflow that would cause dyspnea. The patient's dyspnea could have resulted from any of several other non-laryngeal causes. Evaluation of 117 adolescents who were referred specifically for exercise-induced dyspnea (EID) found only 15 of the 117 with laryngeal causes of dyspnea, 13 with VCD, and 2 with laryngomalacia.² The article by Leong et al¹ reports a prevalence of VCD or ILO of 5% to 8% among adolescents and 20% among individuals participating in regular exercise. These implausible prevalences are likely the result of a methodology that identifies VCD or ILO on the basis of observations that include movements of aryepiglottic folds and vocal cord adduction without airway obstruction.¹

Leong et al¹ and others appear to assume that the laryngeal area is the major cause of exertional dyspnea that is not due to asthma. However, EID can have many causes in otherwise healthy adolescents and young adults.² Determination of the etiology of EID that is not due to asthma can best be achieved with cardiopulmonary testing during exercise. In such cases, measurements would then include oxygen utilization, carbon dioxide production, heart rate and ECG monitoring, respiratory rate, maximum tidal volume, FV loop monitoring, minute ventilation, oximetry, pH, and pCO₂ (an alternative to arterial catheter is a fingerstick as exercise is terminated).² If stridor is heard or decreased flows during FV monitoring are seen in association with dyspnea, prompt laryngoscopy while the patient is symptomatic can identify the specific laryngeal cause of upper airway obstruction.

Thus, VCD and ILO are not synonymous. ILO is a literal hypernym, an umbrella term that includes the variations and phenotypes of VCD and other manifestations of laryngeal disorders causing upper airway obstruction. Moreover, there are causes of EID in otherwise healthy young people that are not

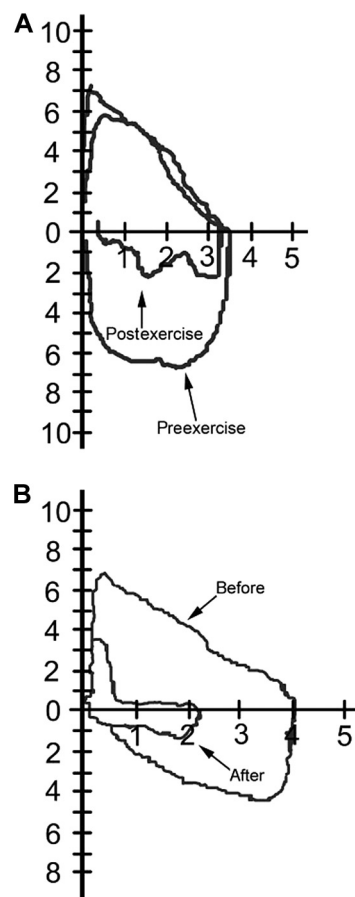


FIG 1. FV loop patterns in 2 patients obtained before and while they are symptomatic. **A,** The inspiratory flow in this 15-year-old girl with exercise-induced inspiratory stridor is markedly decreased after exercise (see the video at the website <https://www.milesweinberger.com/copy-of-exercise-induced-dyspnea>). **B,** FV loops from another 15-year-old girl with spontaneous-onset severe dyspnea with inspiratory and expiratory stridor occurring during our evaluation. Decreased flow on inspiration and expiration are illustrated by the spirometric tracing. Flexible laryngoscopy demonstrated the vocal cords and false vocal cords to be severely adducted throughout the respiratory cycle (see the video at the aforementioned website).²

limited to the laryngeal area. The reality is that the focus on the larynx as the primary cause of exertional dyspnea provides neither optimal diagnosis for the cause of EID in patients nor the most relevant education for physicians.

DISCLOSURE STATEMENT

Disclosure of potential conflict of interest: The author declares that he has no relevant conflicts of interest.

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