Correspondence

Lung function after viral early childhood wheezing

To the Editor:

Guilbert et al[1] published their interesting lung function results from the Childhood Origins of Asthma (COAST) study analyzed longitudinally at age 4 to 8 years in at-risk children in relation to wheezing during respiratory syncytial virus (RSV) or rhinovirus (RV) infection at age less than 3 years. Children with RV wheezing illness demonstrated significantly lower forced expiratory volume in 1 second (FEV_1), $FEV_{0.5}$, and forced expiratory flow at 25% to 75% of forced vital capacity (FVC) in both prebronchodilator and postbronchodilator spirometry and significantly lower FEV_1% of predicted, FEV_1/FVC, and $FEV_{0.5}$/FVC in only prebronchodilator spirometry when compared with those who did not wheeze during RV infection. In the impulse oscillometry, the groups did not differ for resistance at 5 Hz but differed for reactance at 5 Hz in prebronchodilator measurements. In contrast, no differences were found between children with and without RSV wheezing at age less than 3 years. Children with asthma had lower forced expiratory flow at 25% to 75% of forced vital capacity values than did those without asthma. The authors present no categorized data to allow estimating how many children had an abnormal lung function. The means and standard deviations of FEV_1% of predicted, as well as of FEV_1/FVC and $FEV_{0.5}$/FVC, suggest that most, if not all, findings were within normal limits.

The results that FEV_1% of predicted, FEV_1/FVC, and $FEV_{0.5}$/FVC were decreased only in prebronchodilator spirometry suggest that previous RV-induced wheezing was associated with reversible airway narrowing. In the impulse oscillometry, on the other hand, reactance may reflect more elastic properties of the lungs than obstruction in the airways. The results are in line with our observations obtained from the long-term follow-ups of children who were hospitalized for RV and RSV bronchiolitis at age less than 24 months.[2,3] At early school age, RV bronchiolitis in infancy was associated with bronchial hyperresponsiveness in the exercise challenge by free running outdoors (odds ratio = 6.5 by FEV_1 decrease >12%, $P = .027$, vs former non-RV bronchiolitis patients), though 13 of the 19 former RV bronchiolitis patients used inhaled corticosteroids as continuous maintenance for asthma. At late school age, the differences in bronchial hyperresponsiveness studied by exercise and methacholine challenges were not anymore significant between former RV bronchiolitis and non-RV bronchiolitis patients.[3] Instead, preliminary evidence was found that RSV bronchiolitis in infancy was associated with a restrictive pattern of lung function disorder. FVC was 93.7% predicted (±11.1) versus 99.6 (±12.6) ($P = .009$ adjusted for age on admission and atopy). Although bronchiolitis was severe requiring hospitalization in infancy and postbronchiolitis wheezing, asthma, and asthma treatment were common in the study subjects, lung function was mainly within normal limits at both early and late school age.[2,3] Both RV etiology of bronchiolitis and later asthma risk were significantly associated with asthma in parents and early-life atopy, atopic sensitization, and eosinophilia in children.[2-5]

The authors conclude that in a high-risk birth cohort, RV infection with wheezing in early childhood is the most significant predictor of decreased lung function up to age 8 years.[1] Whether low lung function is a cause or a consequence of RV wheezing needs further studies. An interesting possibility is that RSV bronchiolitis in infancy might lead to restrictive pattern and RV-induced wheezing to obstructive pattern of later lung function disorder.

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