Exhaled Nitric Oxide in Wheezy Infants Predicts Persistent Atopic Asthma and Exacerbations at School Age

J Asthma Allergy. 2020;13:11-22.

Background: There are limited data assessing the predictive value of fraction of exhaled nitric oxide (FENO) in infants/toddlers with recurrent wheezing for asthma at school age.

Objectives : In a cohort of infants/toddlers with recurrent wheezing determine the predictive values of sedated single-breath FENO (SB-FENO) and awake tidal-breathing mixed-expired FENO (tidal-FENO) for active asthma, severe exacerbations, and lung function at age 6 years.

Methods: In 44 infants/toddlers, SB-FENO was measured under sedation at 50 mL/sec in conjunction with forced expiratory flow and volume measurements, and tidal-FENO was measured during awake tidal breathing. Clinical outcomes and lung function were assessed at age 6 years in 36 subjects.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet

Utility of FENO in Preschool Wheeze in Predicting Future Asthma.

Results: Enrollment SB-FENO was significantly higher among subjects with active asthma at age 6 years than among subjects without asthma (36.4 vs. 16.9 ppb, $p < 0.0001$), and the odds of asthma was 7.6 times greater (OR 7.6; 95% CI 1.8–31.6) for every 10 ppb increase in enrollment SB-FENO.

- A ROC analysis demonstrated that an enrollment SB-FENO > 31.5 ppb predicted active asthma at age 6 years with an area under the curve (AUC) of 0.92 (95% CI: 0.82–1).
- **SB-FENO was also higher among subjects who experienced severe asthma exacerbations during the year preceding age of 6 years.**
- SB-FENO at enrollment and lung function measures at age 6 years were modestly correlated and SB-FENO was significantly higher among subjects with bronchodilator responsiveness (BDR) at age 6 years.
- Tidal-FENO was not predictive of active asthma, exacerbations, or lung function at age 6 years.

Conclusion- In wheezy infants/toddlers, SB-FENO was predictive of school-age asthma and associated with lung function measures at age 6 years.

EXPERT COMMENT

“Recurrent preschool wheezing is a heterogenous clinical entity with multiple etiologies. The most challenging aspect is to differentiate transient viral induced wheezing from children who have or will go on to develop persistent asthma. The problem is compounded by the fact that lung function testing is not feasible in this group of children and the Asthma Predictive Index has poor sensitivity and specificity. FeNO can be an exciting bedside point of care test which can guide therapy in preschool children. Though the present equipment for clinical use can be used in children above 4 years , hopefully this studywill inspire development of new technologies for point-of-care testing methodologies feasible in awake young children which will be useful to predict atopic asthma in wheezy infants and toddlers”.

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With warm regards,

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Reference

White MP, Kolstad TK, Elliott M, Cochrane ES, Stamey DC, Debley JS. Exhaled Nitric Oxide in Wheezy Infants Predicts Persistent Atopic Asthma and Exacerbations at School Age. *J Asthma Allergy*. 2020;13:11-22