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Nasal Nitric Oxide Sampling In 0-5-year-old Patients With Cystic Fibrosis, Primary Ciliary Dyskinesia and Healthy Controls

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Introduction Nasal nitric oxide (nNO) is extremely low in individuals with primary ciliary dyskinesia (PCD) and is recommended as part of early workup. We investigated the results of a former study whether tidal breathing sampling for a few seconds and vacuum sampling was as discriminative between PCD and healthy controls (HC) as conventional tidal breathing sampling (cTB-nNO) for 20–30s.

Methods We performed very rapid sampling of tidal breathing for 4 s (TB-nNO_{4sec}) and vacuum sampling with applied negative pressure (TB-nNO_{vac}; negative pressure was applied by pinching the sampling tube) for < 2 s resulted in enhanced suction of nasal air during measurement. Feasibility, success rate, discriminatory capacity, repeatability and agreement were assessed the three sampling modalities.

Results We included 5 patients with PCD, median (IQR) age of 1.2 (0.3-4.1) years and 13 HC, 3.4 (1.3–4.4) years and 8 patients with cystic fibrosis (CF) as a disease control group, 2.4 (0.4–2.9) years. Measured nNO values with TB-nNO_{4sec} and TB-nNO_{vac} showed similar and comparable results to cTB-nNO measurements (HC_{4sec}: p = 0.11, HC_{vac}: p = 0.87, PCD_{4sec}: p = 0.56, PCD_{vac}: p = 0.23, CF_{4sec}: p = 0.38, CF_{vac}: p = 0.06).

Conclusion TB-nNO_{4sec} and TB-nNO_{vac} were comparable to cTB-nNO. TB-nNO_{4sec} and TB-nNO_{vac} requires only a few seconds of probe-in-nose time and is feasible for preschool kids and infants (0-5 years). Rapid TB-nNO sampling needs standardization and further investigations.

Keywords Primary ciliary dyskinesia · Nasal nitric oxide · Rare lung diseases · Pediatrics · Cystic fibrosis