European Respiratory Society
Annual Congress 2012

Abstract Number: 3491
Publication Number: 4304

Abstract Group: 5.2. Monitoring Airway Disease
Keyword 1: Nitric oxide **Keyword 2:** Breath test **Keyword 3:** Orphan disease

Title: nNO is a good but not perfect screening test for PCD

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Body: Introduction: Nasal NO (nNO) is used to screen for Primary Ciliary Dyskinesia (PCD). nNO and exhaled NO (FENO) are low in PCD and cystic fibrosis (CF), but nothing is known about nNO in patients with humoral immunodeficiencies (HID). We want to study the discriminate validity of nNO and FENO or composite scores for the diagnosis of PCD. Methods: 157 patients between 5 and 25 years old performed nNO and FENO measurements using the chemiluminescence analyzer Spiroware 3.0® (Eco Medics): 27 with PCD, 28 with CF, 32 with asthma (A), 30 with HID and 40 healthy controls (C). 6 nNO measurements were performed during slow exhalation against a fixed resistance. For FENO, 2 measurements were done conform ATS/ERS guidelines. Results: For nNO, median coefficient of variation (CV) was 7.2% (P25 4.1%, P75 19.7%, range 1 to 92%), despite perfect test performance. nNO differed significantly between PCD and no PCD and between PCD and CF, A, HID and C individually. nNO < 270 ppb had a sensitivity of 92.6 % and a specificity of 89.2 % to diagnose PCD. Area under the curve (AUC) for the ROC curve was 0.978. However, some overlap exists between PCD and CF, HID and A. FENO was significantly lower in PCD versus no PCD and in PCD versus CF, A, HID and C. FENO < 7.1 ppb had a sensitivity of 92%, but only a specificity of 71.6% (AUC 0.833). The composite scores nNO + FENO, nNO * FENO, nNO * $FENO^2$ all had a lower AUC for the ROC curve, only the composite score nNO^2 * FENO had an equal AUC and a slightly higher specificity (93.1% for a sensitivity of 92.0%) than nNO measurement alone. Conclusion: Both nNO and FENO are useful screening tests for PCD: using the composite score nNO^2 * FENO increases the specificity with stable sensitivity.