P81 FEASIBILITY OF MEASURING LUNG CLEARANCE INDEX (LCI) IN A CLINIC SETTING IN PRESCHOOL CHILDREN WITH A RANGE OF AIRWAY DISEASES

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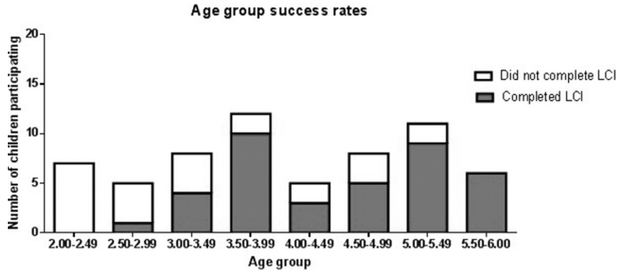
Introduction and objectives LCI is a measurement of lung function (in particular distal airway disease) derived from the multiple breath washout (MBW) test (*Eur Resp J* 2013; 41:507–22). Although practical in a research setting, feasibility in a clinic setting (with limited time and without using sedation) in young children is not known. We looked at success rates of LCI, and LCI0.5 (a shortened washout which can be accomplished more quickly) in preschool children (aged 2–6 years) with recurrent wheeze (*Eur Resp J* 2008; 32:1096–110), cystic fibrosis (CF), recurrent cough/infections, and healthy controls. Our hypothesis (based on other research performed in this field (*Thorax* 2012; 68:586–587) was that shortened LCI0.5 would be more feasible than full LCI, and that the test would be more feasible in older preschool children than younger.

Methods 62 preschool children median age 3.9 (2.07–5.95) years, 34 male, (n = 21 with wheeze, n = 11 CF, n = 2 PCD, n = 22 other, n = 5 healthy controls) performed MBW test during a routine outpatient visit. Wheeze was doctor diagnosed or parent reported via wheeze questionnaire.

Results 66% of children successfully completed either the LCI or LCI0.5. Completion according to age group is shown in Figure 1. LCI success rate in wheezers was 67%, healthy controls 100%, CF 82%, PCD 100% and recurrent cough/infections 50%. Success rate was identical between males and females (61%), and was similar comparing LCI0.5 (42/62) to full LCI (38/62). Three of the four that only completed LCI0.5 were less than 3.5 years old.

Conclusions LCI is a feasible test in the clinic setting for preschool children; however success rates under 3 years of age in all disease groups are very low. Use of the shortened washout (LCI0.5) marginally improves success rates, but may improve test completion in the youngest children.



Abstract P81 Figure 1

P82 LUNG CLEARANCE INDEX (LCI) AND GENOTYPE-PHENOTYPE CORRELATIONS IN PRIMARY CILIARY DYSKINESIA (PCD)

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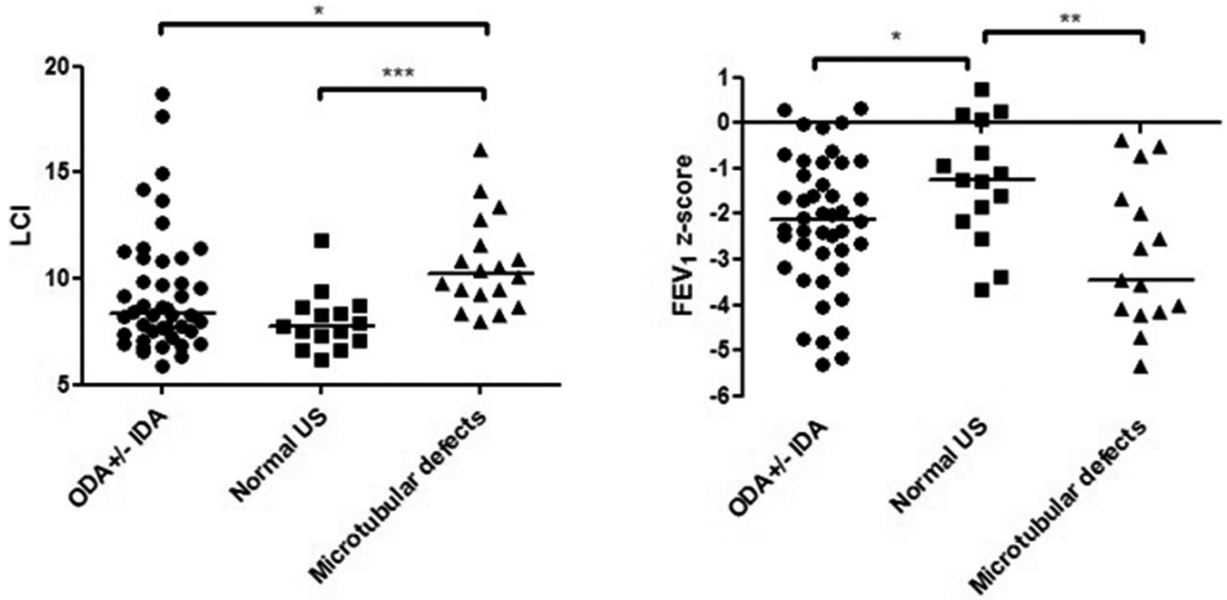
Introduction and objectives Mutation type may affect clinical phenotype in PCD, as shown by differences in forced expiratory volume in 1 s (FEV_1) (AJRCCM 2015;191:316–324). LCI, measured using multi-breath washout (MBW) is raised in PCD (AJRCCM 2013;188:545–549) but the relative sensitivities of the two physiological measurements is disputed (Thorax 2015;70: 339–345, and 305–306). We hypothesised that LCI would be more sensitive to genotype-phenotype differences in PCD.

Methods MBW (using sulphur hexafluoride MBW with a photoacoustic gas analyser) and spirometry were performed in 77 PCD patients (mean age 16.4 years (range 4–62.2), 33 males, mean FEV_1 z score -2.09 (range -5.33–1.59)). 44 had outer dynein arms (ODA) defects, or both inner (IDA) and ODA, 18 had microtubular defects (either transposition or microtubule disorganisation with absent IDA), 15 had normal ultrastructure (diagnosis made on either genetics (n = 10), low nasal NO, clinical phenotype and consistent dyskinesia on light microscopy



Abstract P82 Figure 1 LCI is worst in other defects group than dynein arm defects (p = 0.01) or normal ultrastructure (p = 0.0002). FEV_1 is better in normal ultrastructure than dynein arm (p = 0.04) and other defects (p = 0.007)