Feasibility of carrying out spirometry in 3 and 4 year old children in a standard clinical setting

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Objective: We used to introduce spirometry to 5 year old (yo) children with the aim of having reliable results by the age of 6. In 2009 we attempted this with 4yoS. In 2011 a 2.5yo girl was keen to copy her 4yo sibling so was allowed to try spirometry simply to avoid conflict. Since she made a reproducible effort we decided to attempt this in all 3yoS.

Methods: Spirometry was carried out in clinic by the physiotherapist who knew which blowing techniques the children had learned during airway clearance, such as bubble PEP. A CareFusion MicroLab spirometer was used with the child incentive. Children aged 3 with good comprehension attempted the test. The parents undertook the potential unreliability of the test. The children were asked to perform one long blow similar to blowing out birthday candles. The reaction of the incentive cartoon was explained. The flow-volume loop was checked between blows and further explanation given if necessary. The best of 3 attempts was recorded.

Results: Some children took a second breath and others did not complete the blow, particularly after the incentive was met. During successive visits this usually improved. Overall 9 of 10 3–4yoS produced reproducible results, 5 of whom had useful results at age 3. Several children have had these repeated on multiple clinic visits showing good lung growth with age.

Conclusion: We have demonstrated that it is feasible during normal appointments to undertake reproducible spirometry in a significant proportion of children as young as 3. With the new global lung initiative normal ranges extending to younger age groups we will be able to make an earlier start in following individual trends in lung function.

What factors determine lung function decline in Polish CF children?

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Objective: It seems that the severity of lung disease in children with cystic fibrosis (CF) could depend on the type of mutation in the cystic fibrosis transmembrane conductance regulator gene (CFTR). However, there is wide variability in course of other demographic and clinical variables as predisposing factors in lung function decline.

Aim: To identify risk factors that modify the disease in children suffered from CF.

Methods: The follow-up time was at least 5 years of respiratory status observation based on FEV1. The socio-economic data, perinatal interview, time of CF diagnosis and introduction of standard therapy including tobramycin inhalation solution (TIS), chronic colonization including Pseudomonas aeruginosa (PA) and number of exacerbations and hospitalizations were assessed.

Results: The mean age of 46 included children was 12.3±7.4 years. Delta F508 homozygous were detected in 42.9%. The most significant predictors related to the decline of FEV1 were PA chronic colonization (OR: 1.01, 95%CI: 1.00–1.02; p=0.0165) and late TIS initiation after first detection of PA (OR: 1.02, 95%CI: 1.00–1.03; p=0.0071). A logistic regression analysis confirmed the independence of other demographic and clinical variables as predisposing factors in lung function decline.

Conclusion: Our study revised that chronic PA colonization and late TIS initiation after first detection of PA at risk of pulmonary decline in CF children. Above results strongly suggest that in order to be maximally effective, TIS treatment should begin early after first detection of PA.