232 A new method for monitoring spirometry − implications for cystic fibrosis care

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Introduction: Accurate serial assessment of FEV1 is essential to help the clinician combat deterioration in CF patients, and spirometry equipment must be capable of reliable and reproducible measurements. Traditional equipment (e.g. Vitalograph 2120) uses reusable flow sensors (i.e. pneumotachograph) which require disposable filters, thereby increasing equipment dead-space and resistance. Newer technology (Spirostik™) uses disposable flow sensors which do not require filters, reducing dead-space and airflow resistance. We have recently switched over to this new technique and have compared its effect on the FEV1 measurement in our adult CF patients.
Method: 85 consecutive adult CF patients (mean age 28 [range 17–53], mean FEV1 59% [12–120], 46 male) performed FVC manoeuvres (measuring FEV1) according to ATS/ERS guidelines, on Spirostik™ and Vitalograph 2120. Student's paired t test was used for statistical analysis.
Results: Patients found the new device easier to use, since it gave them more feedback during the manoeuvre. Spirostik™ recorded on average 9.7% higher FEV1 than Vitalograph 2120 (mean FEV1 2.41 litres [SD 1.00, range 0.8–5.14] versus 2.18 [0.89, 0.6–4.32], $P < 0.001$). Overall, 76 patients (91%) had higher values on Spirostik™ compared to 2120.
Conclusions: This potentially more accurate measure of spirometry has increased the average value of FEV1 in our patients significantly. This not only has implications for clinical practice in that we are now having to "recalibrate" our views of individual patient's clinical progress, but it will also alter the value of data sent to national registries.

233 Allergies in children with cystic fibrosis

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Background: Allergies are commonly found in children. Asthma and allergic bronchopulmonary aspergillosis (ABPA) are important co-morbidities associated with cystic fibrosis (CF). The aim of the paper was to evaluate the frequency of allergic reactions, with respiratory or cutaneous manifestations among children with cystic fibrosis.
Methods: One hundred and twenty-four children with CF were evaluated. Observational study was designed, using for retrospective analysis data records from our CF Centre. Frequency of allergic rhinitis, asthma, aspergillosis was evaluated, also food allergies and antibiotics allergic reaction. Skin prick test and IgE specific tests were used.
Results: Allergic rhinitis was diagnosed in 12 patients (9.67%). A small percentage 7.25% (9 patients) were diagnosed with associated asthma. Thirteen children (10.4%) were diagnosed with sensitization to ABPA, 3 of them had aspergillosis, with rapid decline of lung function. Skin allergies were much frequently associated, over 50% of CF children had at list one dermatitis episode, more than 70% of those IgE-specific positive. Fortunately, documented antibiotic allergy was found in only 2.41% of patients.
Conclusion: Although respiratory allergies are increasing in frequency, they are not significant co morbidity in our CF patients. Predominant clinical feature of allergic reaction was cutaneous. What features are protective for development of respiratory allergies remains to be assessed.

234 Proteolysis–antiproteolysis systems in children with bronchial pathology at different levels of fibrosis

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Aim: To investigate the activity and levels of proteolytic enzymes and activity of anti-proteolysis in children with bronchial pathology (BP) and different levels of lung tissue fibrosis (FLT).
Objectives and Methods: 184 patients with BP and cystic fibrosis (CF) were enrolled. Neutrophils-enriched plasma was placed in test tubes with Lithium heparin. To determine the levels of matrix metalloproteinase-7 (MMP-7), neutrophil elastase (NE) and the activity of anti-elastase (AE), immuno-enzymes method was used.
Results: The NE level in patients not affected by FLT was 25% lower than that in patients with FLT, but due to data variations, the difference was not statistically significant. In all patients, the levels of NE were from 3.4 to 7.2 times higher than those in the control group (CG, $n = 30$) ($p < 0.01$–0.001). The activity of AE in non-FLT patients with lung pathology did not differ from the CG. FLT stimulated the activity of AE. In patients at the initial stages of fibrosis ($n = 15$), the NE activity was 1.5 times lower than in children with diffusive pneumosclerosis ($n = 9$) ($p < 0.05$). The MMP-7 level in BP children not affected by FLT was higher than that in CG ($p < 0.001$). Across the board, the FLT group showed almost twofold MMP-7 content comparing to patients with no fibrosis.
With the increase of fibrosis, the MMP-7 level went up, reaching 12.5 ± 2.0 ng/mml for children with diffusive pneumosclerosis; for those with localized FLT, it was 5.4 ± 0.58 ng/mml, and for patients without fibrosis it was 3.45 ± 0.12 ng/mml.
Conclusion: Patients with diffusive pneumosclerosis, the majority of whom were children with CF, demonstrated high levels of MMP-7 and AE activity.

235 The sensitivity and specificity of cough plates in children with cystic fibrosis

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Identification of bacterial pathogens is paramount for prompt and effective treatment of respiratory exacerbations in children with cystic fibrosis (CF). This can be a challenge in non expectorating patients as reliability of cough swabs (CS) is poor. More recently, cough plates (CP) have shown potential as an alternative method.
Aim: To ascertain the effectiveness of CP as compared to CS and to assess the impact of cough strength on efficacy of CP.
Method: Non expectorating children with CF aged 3–16 years were recruited. Baseline data was recorded and peak cough flow (PCF) measured. Following this, specimens were taken with CP and a CS in randomised order. This procedure was repeated on up to 4 clinic visits to obtain multiple measurements.
Results: 95 subjects participated, mean age 8.8 ± 4.1 years, 45 males. Mean baseline % predicted FEV1 was 90.8 ± 18. PCF was recorded in 76 patients, mean 294.7 ± 128.7. 324 sets of specimens were collected. Overall, pathogens were isolated in 18.2% of CS and 8% of CP $p < 0.05$. Numbers for individual visits were as follows: visit 1: CS 17.9%, CP 10.5% ($p = 0.065$), visit 2: CS 26.7%, CP 7% ($p < 0.05$), visit 3: CS 12.8%, CP 9% ($p = 0.45$), visit 4: CS 14%, CP 4.6% ($p = 0.07$). Agreement between the two specimens occurred in only 5.5% of cases. 6 CP isolated pathogens when the CS was negative whilst 40 CS were positive with a corresponding negative CP. Cough strength increased with age and pathogens were more likely to be isolated on the CP from older children. 84% of subjects preferred the CP.
Conclusion: CP are less effective than CS in the identification of respiratory pathogens in children with CF.