

CD4+ and CD8+ cells producing IFN- γ , TNF- α or dual responses was higher in all participants with TB compared with LTBI. CD4+IL-2+ cells were reduced by HIV co-infection, especially IFN- γ +IL-2+ cells ($p=0.008$) and this was apparent as a proportion of total cytokine response ($p=0.016$).

Conclusions The proportion of CD8+ IFN- γ or TNF- α responders was a more sensitive indicator of TB stage than CD4 responses. CD4 + IL-2 responses were vulnerable to HIV co-infection, possibly affecting CD8+ IFN- γ and TNF- α responses at high viral loads, increasing susceptibility to active TB. These immune correlates of the TB spectrum and the MTB-specific T-cell deficiencies caused by HIV co-infection are important in rationalising treatment of co-infection as well as testing new vaccines and therapeutics.

Cystic fibrosis: bench to bedside

S44 LUNG CLEARANCE INDEX (LCI) AND FEV₁ CORRELATE EQUALLY WITH TREATMENT BURDEN AS MEASURED BY CYSTIC FIBROSIS QUESTIONNAIRE-REVISED (CFQ-R)

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Introduction LCI derived from multiple breath washout (MBW), measures the elimination of an inert marker gas during tidal breathing and is a sensitive measure of ventilation inhomogeneity in CF. LCI is more sensitive than FEV₁ and FEF₂₅₋₇₅ in detecting airways abnormalities and does not require a forced manoeuvre. The CFQ-R is a validated patient reported outcome used to assess health related quality of life (HRQoL) and patient perception of symptoms. There is a need to better understand the relationship between LCI, HRQoL and symptoms.

Objective To investigate the relationship between LCI, FEV₁ % pred, HRQoL and symptoms as measured by the CFQ-R.

Methods These data are part of a larger study investigating the role of LCI as a tool to monitor lung function longitudinally. Patients were recruited from the adult and paediatric CF centres in Belfast Health and Social Care Trust. Inclusion criteria: clinical diagnosis of CF; clinically stable (exacerbation free=4 weeks); informed consent. Age appropriate versions of the CFQ-R were used (patients >14 years, children aged 12 and 13, children aged 6-11). A parent questionnaire was completed in addition where appropriate (for children aged 6-13). The instrument yielded a score of 0-100 for each domain, with higher numbers indicating better function on various domains. Participants completed three MBW tests, using 0.2% sulphur hexafluoride and a modified Innocor device. LCI was reported as the mean of at least 2 acceptable tests. Spirometry was performed to ATS/ERS standards.

Results Data were collected for 21 patients (15M:6F), age range 6-51 yrs, mean (SD) 26.4 (13.7). Mean (SD) FEV₁ % pred was 77.1 (16.3). Mean (SD) LCI was 9.4 (2.5) (normal <7.5). LCI correlated negatively with FEV₁% pred ($r=-0.62$ $p=0.003$). The domain of treatment burden was significantly correlated with LCI ($r=-0.67$ $p=0.001$) and FEV₁% pred ($r=0.69$ $p=0.001$). However no correlation was observed with respiratory symptoms or any other domain of the CFQ-R.

Conclusion Patients with a greater treatment burden are more likely to have more severe lung disease. The severity of CF lung disease as determined by FEV₁% pred and LCI correlate equally with treatment burden. This further validates LCI as a useful measure of lung function.

S45 CLINICAL EFFICACY OF SEASONAL INFLUENZA VACCINATION IN ADULTS WITH CYSTIC FIBROSIS

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Introduction Influenza vaccination produces an adequate serological response in adults with cystic fibrosis (CF)¹ and is a recommended part of routine CF care. There is little evidence to date, however, of a clinical benefit from influenza vaccination in this patient group. We compared prospectively the rate of influenza infection with vaccination status among 100 adults with CF over the 2010/2011 UK influenza season.

Methods 100 adults with CF were enrolled in a prospective observational study of respiratory viruses between December 2010 and March 2011. Sputum, nose- and throat-swabs for PCR-based virological analysis were sent every 2 months and additionally at onset of acute respiratory illness through to June 2011. Prior to enrolment, sputum was sent for virology at onset of pulmonary exacerbations as part of routine care. Details of influenza vaccination status were obtained from the CF centre's database and GP records. Previous infection with influenza A/H1N1 was determined from clinical records.

Results Patients had a median age of 28 years (range 18-62). 88% had received the 2010/2011 seasonal influenza vaccine (A/California/7/2009/H1N1, A/Perth/16/2009/H3N2 & B/Brisbane/60/2008). 44% of the cohort had received the 2009 monovalent swine-origin influenza A/H1N1 vaccine and 8 patients had previously had PCR-confirmed swine-origin influenza. Over the study period there were 10 cases of influenza: 5 influenza A/H1N1, 4 influenza B and 1 dual influenza A/B infection. Among patients who received the 2010/2011 seasonal vaccine, 9/88 (10.2%) suffered influenza compared with 1/12 (8.3%) of those who had not been vaccinated (OR 1.25; 95% CI 0.14 to 10.9). All 9/9 patients who developed influenza despite being vaccinated were homozygous for the F508del mutation compared with 43/79 (55.7%) of vaccinated patients who did not develop influenza ($p=0.009$). No significant difference was seen between these groups with regard to age, gender, BMI, lung function, diabetes mellitus or use of oral corticosteroids.

Conclusions Influenza vaccination may have limited clinical efficacy in adults with CF. The influence of CF genotype on susceptibility to influenza infection and response to vaccination requires further investigation.

REFERENCE

1. Ong ELC, et al. Influenza vaccination in adults with cystic fibrosis. *BMJ* 1991;**303**:557.

S46 A COMPARISON OF THREE DIFFERENT SPECIMEN TYPES FOR THE DIAGNOSIS OF VIRAL RESPIRATORY INFECTIONS IN ADULTS WITH CYSTIC FIBROSIS

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Introduction Respiratory viruses have been associated with increased symptoms and a decline in lung function in patients with cystic fibrosis (CF). The optimal means of diagnosis of respiratory viruses in CF is unclear. We compared the suitability of sputum,