observational studies (3 cross-sectional, 8 case-control and 8 cohort) and 12 were randomised controlled trials. Sixteen of the 19 observational studies reviewed reported statistically significant associations between vitamin D deficiency and susceptibility to ARI, and 3 reported no such association. Six of the 12 clinical trials reviewed reported protective effects of vitamin D against ARI, while five reported null effects, and one reported an adverse effect on pneumonia recurrence.

Conclusions Observational studies report consistent associations between vitamin D deficiency and susceptibility to ARI in a wide range of age-groups in diverse clinical settings. By contrast, randomised controlled trials of vitamin D supplementation for the prevention of ARI report conflicting results, possibly reflecting varying prevalence of vitamin D deficiency in study populations and/or heterogeneity in vitamin D supplementation regimens investigated.

P20 FATIGUE AND POOR LUNG FUNCTION ARE SIGNIFICANTLY ASSOCIATED WITH IMPAIRED HEALTH-RELATED QUALITY OF LIFE (HRQOL) IN A LARGE COHORT OF PATIENTS WITH CHRONIC PULMONARY ASPERGILLOSIS

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KA Al-shair, GT Atherton, DK Kennedy, GP Powell, DWD Denning. *The National Aspergillosis Centre, University Hospital of South Manchester, Manchester University, Manchester, UK*

Introduction Fatigue is a prominent disabling symptom in several chronic pulmonary diseases; however, its impact on HRQoL in patients with chronic pulmonary aspergillosis (CPA) has not been investigated.

Method Our 154 patients with CPA completed the Manchester COPD Fatigue Scale (MCFS), *Thorax 2009*)) and the SGRQ in our specialist referral centre. MCFS measures total fatigue and sub-components comprehensively. Lung function and body mass index were measured. Univariate and multivariate linear and binary analysis, and the principal component analysis (PCA) were used.

Results The mean (SD) age (61.1 (10.8)) years and 44% were female; FEV_1% (63.3 (24.9)), BMI (23.7 (5.2)), SGRQ total score (55.6 (23.5) and MCFS total score (30 (14.9)).

PCA showed that 27 items of MCFS loaded clearly on three components: physical and psychosocial and cognitive fatigue.

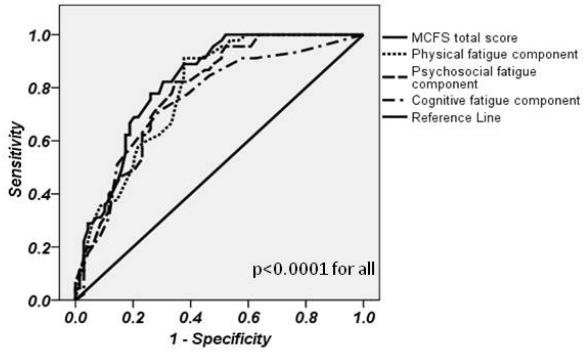
Univariate analysis showed a strong association between total SGRQ score and MCFS score (r=0.81, p<0.001). Using total SGRQ as a dependent variable, linear multi-variate analysis showed that fatigue was the strongest factor (beta = 0.83 p<0.0001) associated with impaired health status followed by FEV_1% (beta= –0.22, p=0.009), but no statistically significant association with age, BMI and pack/years. This model explained 70% of the variance of SGRQ total score.

Using patients' self-assessment grades of SGRQ (Very poor, poor, fair, good and very good), one-way ANOVA showed that patients with "very poor" health status had the highest fatigue scores (45 (6.4)), following by poor (35 (10.1)), fair (30 (10.4)), good (14 (10.9)) and very good (0) (p<0.001). Splitting the group to (very poor and poor) versus (fair, good and very good), the ROC curve analysis indicated significant ability of MCFS and its components to detect change in HS (AUC=0.82; range 0.75–0.9, p<0.0001) as demonstrated in figure 1.

Furthermore, binary regression analysis showed that only fatigue score (OR=0.92, 95% CI 0.87–0.97; p=0.002) and FEV_1% (OR=1.04, 95% CI 1.01–1.07, p=0.02) are significantly associated with impaired health status after correcting to age, gender and DLCO%.

Conclusion This is the first study directly implicating fatigue as a major factor affecting health-related-quality of life in patients with CPA.

Figure 1, *ROC curve analysis of the MCFS and its components; discrimination between health status categories*



Abstract P20 Figure 1

P21 LONG TERM ANTIFUNGAL TREATMENT (LTAFT) IS EFFECTIVELY ASSOCIATED WITH IMPROVEMENT IN HEALTH STATUS (HS) IN PATIENTS WITH CHRONIC PULMONARY ASPERGILLOSIS (CPA)

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KA Al-shair, MK Kirwan, GA Atherton, AC Caress, DWD Denning. *The National Aspergillosis Centre, University Hospital of South Manchester, Manchester University, Manchester, UK*

Introduction CPA is a chronic progressive respiratory infectious disease results in significant lung tissue destruction with a 50%+ 5 year mortality**.** Response to antifungal therapy is slow, with ~80% of patients who respond doing so by 6 months. We recently demonstrated the reliability and validity of SGRQ in examining HS in CPA (Chest, in press), and now present longitudinal data on the efficacy of LTAFT in improving HS in CPA patients.

Method HS of 98 CPA patients were assessed 3 times over 6 months using the well-established standardised SGRQ. CPA severity was assessed using our published CPA banding system. FEV_1, BMI, dyspnoea (using MRC dyspnoea scale) were measured.

Results Mean age was 58 years and 48% were female; and 25, 58 and 15 had band 1, 2 and 3 CPA respectively. At visit 2 and 3 (V2 and V3), we found that overall total and domain SGRQ scores were either lower (improved health status) or similar compared to V1 (table 1).

Categorizing the cohort by those who reported improvement or deterioration by a total SGRQ score of ≥4 at V3 comparing to V1, we found that 43% improved, 22% remained stable and 35% deteriorated. The median (IQR) of total SGRQ score of the improved group at V3 was 58 (42–66) compared to 71 (60–79) at V1; and for the deteriorated group was 67.5 (57–76) at V3 compared to 62 (41–67)) at V1. The deteriorated were older (62 (9.8) years versus 56.1 (9.3) (p=0.008); and tended to have lower BMI, more dyspnoea and worse lung function. Moreover, binary regression multivariate analysis showed that age maintained its association with deterioration in HS (OR 1.13, 95% CI 1.01–1.26, p=0.03) after correcting for gender, BMI and FEV_1%.

Of the 37 patients started on an antifungal agent at V1 who took it for 3+ months (including a 3 week IV course of amphotericin B), 22 (59%) improved, 11 (30%) were stable and 4 (11%) deteriorated at V3.

Conclusion LTAFT prevented/reduced the progression of CPA and patients preserved overall good HS. More therapeutic approaches for this progressive disease are urgently needed.

Abstract P21 Table 1

Table 1, SGRQ total and domains score in all visits; median (IQR) were presented

	Visit 1	Visit 2	P*	Visit 3	P#
SGRQ symptoms	69 (51-82)	69 (55-82)	0.78	69 (56-82)	0.55
SGRQ activity	54 (36-67)	50 (34-62)	0.045	48 (32-65)	0.02
SGRQ impact	80 (60-93)	79 (58-93)	0.94	79 (60-93)	0.77
SGRQ total score	64 (49-74)	64 (45-73)	0.22	61 (47-72)	0.19

(*)= Compared to visit 1; (#)= Compared to visit 1

P22 YIELD OF MICROBIOLOGY SAMPLES TAKEN DURING BRONCHOSCOPY PERFORMED FOR THE DIAGNOSIS OF LUNG CANCER

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SA Rolin, DJ Waine. *Plymouth Hospitals NHS Trust, Plymouth, UK*

Introduction and Objectives Previous studies have suggested that bronchial lavage does not improve the yield of bronchoscopy if tumour is visible and biopsies and brushings are taken (1). However, no assessment was made of the microbiological yield from lavage samples. The aim of this study was to determine the prevalence and nature of positive bronchial culture in patients presenting with lung cancer.

Methods A retrospective review was conducted of the case notes of all patients between November 2009 and May 2012 who underwent a flexible bronchoscopy for the diagnosis of lung cancer, and were determined by the operator to have either a definite or probable visible malignancy. In all patients BAL had been performed and sent for microbiological investigation in addition to cytology. Type and frequency of culture were analysed, along with the relationship between culture and lung cancer histology, stage, and the performance status of the patient.

Results 95 patients underwent a flexible bronchoscopy at the time of diagnosis within the time period. The majority were male (62%) with an average age of 70 years (range 31–91). Culture was positive in 37.7% of samples. 32.5% of these organisms were gramme negative (mostly *Pseudomonas spp.* and coliform bacilli), 20.9% gramme positive (*S. pneumoniae*, *S. aureus*, MRSA), 41.9% *Candida spp.*, and 4.7% *Aspergillus spp*. The predominant form of lung cancer was non-small cell (56%, of which 58.4% were squamous), the majority of patients having advanced disease (92% stage IIIA-IV) with a good performance status (55.8% PS 0–1). Patient characteristics, tumour histology, or stage were not significantly different in patients with, or without, positive culture.

Conclusions This study has shown that more than a third of patients investigated for lung cancer had evidence of bronchial colonisation with potentially pathogenic bacteria at the time of diagnosis. This suggests that lavage ought to remain a routine aspect of bronchoscopy for cancer, as identification of bacteria at this early stage might be used to guide the choice of effective antibiotics for the treatment of subsequent pulmonary infections.

1. Waine DJ *et al. Am J Resp Crit Care Med 2004; 169(7):A332.*

P23 A MULTIDISCIPLINARY INTERVENTION TO REDUCE ANTIBIOTIC DURATION IN LOWER RESPIRATORY TRACT INFECTIONS

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[1]CD Murray, [1]A Shaw, [1]TC Fardon, [1]R Smith, [1]S Schembri, [2]JD Chalmers. [1]*Ninewells Hospital, Dundee, UK;* [2]*University of Dundee, Dundee, UK*

Introduction Prolonged courses of antibiotics in patients with lower respiratory tract infections (LRTI) are common and may contribute to antibiotic related side effects and antibiotic resistance. Prescribing shorter antibiotic courses may be equally effective and associated with fewer side effects. We developed and implemented a multidisciplinary intervention to reduce antibiotic duration in hospitalised patients with LRTI.

Methods This was a prospective before and after evaluation study conducted at Ninewells Hospital, Dundee from November 2011–May 2012 (pre-intervention) with post-intervention data collection during June and July. The intervention is scheduled to run until November 2012 but here we present the preliminary results.

The multidisciplinary intervention consisted of automatic stop dates for antibiotics, protocolised antibiotic duration based on national guidelines and ward pharmacist feedback and reminders to stop antibiotics. Data recorded, in addition to length of antibiotic treatment, included underlying diagnosis and suspected antibiotic related side effects.

Results Pre-intervention, there were 281 patients (94 pneumonia, 121 exacerbation of COPD, 24 exacerbation of asthma and 42 LRTI/bronchitis or other chest infection). The mean duration of antibiotics was 8.3 days (range 1–21) with average by diagnosis of 9.3 days for CAP (range 5–21), 8.5 days for LRTI (3–16), 7.7 days for exacerbation of COPD (1–19) and 6.3 days for asthma (1–10). 31.3% of patients had a potential adverse effect of antibiotics.

In preliminary data from the post intervention group, there were 97 patients (45 pneumonia, 40 exacerbation of COPD, 12 LRTI/bronchitis). The mean duration of antibiotic therapy was 6.7 days (range 1–14 days), $p<0.0001$ compared to pre-intervention. Post intervention duration of treatment for CAP was 7.0 days (1–14), $p<0.0001$ and for COPD patients was 6.4 days (5–14), $p=0.0008$ compared to pre-intervention. 16 (16.5%) patients post intervention had antibiotic related adverse effects, $p=0.0005$.

There were 25 (8.9%) deaths pre-intervention and 7 (7.2%) deaths post-intervention, $p=0.6$ suggesting the reduction in antibiotic duration did not result in poorer clinical outcomes.