P42 THE RELATIONSHIP OF HOME ACTIVITY LEVELS TO PSYCHOLOGICAL CO-MORBIDITY IN COPD

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Background Physical activity levels are often reduced in patients with COPD, but are partially amenable to intervention, predominantly by rehabilitation. Depression and anxiety are also commonly observed co-morbidities, which relate to outcomes such as mortality and admission rates.[1] A recent meta-analysis of exercise as a treatment for depression suggested that it may improve depressive symptoms,[2] hence it is recommended by NICE guidance for mild depression. We hypothesised that less active COPD patients would also have higher rates of psychological co-morbidity.

Methods 59 consecutive COPD admissions or attendees to COPD clinic were recruited between January and March 2010, screened for anxiety and depression, and questioned regarding activity levels using the Modified Baecke Questionnaire (MBQ). Those who were already on treatment for anxiety or depression were excluded from further analysis (n=4). Home activity monitoring using the Actigraph was conducted in 20 patients and 6MWT distances recorded.

Results 38.2% of patients were anxious and 36.4% depressed, according to HADS. Both related strongly to exacerbation and admission rates over the preceding 12 months ($p<0.01$), and to QOL as measured by CAT ($p<0.01$). Perceived activity as measured by MBQ was lower in depressed patients ($p=0.02$); this remained significant after regression analysis, adjusting for exacerbations and FEV_1 ($p=0.03$). However, actual activity from the Actigraph showed no relationship to either anxiety or depression (both $p>0.38$).

Conclusions Depressed patients perceive their symptoms to be more severe, and therefore their activity levels lower, than non-depressed patients. However, this did not translate into a difference in actual activity levels. Whether exercise programmes can impact on psychological co-morbidity in COPD requires further research.

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P43 ASSESSING THE VALIDITY OF A HOME ACTIVITY MONITOR IN PATIENTS WITH COPD

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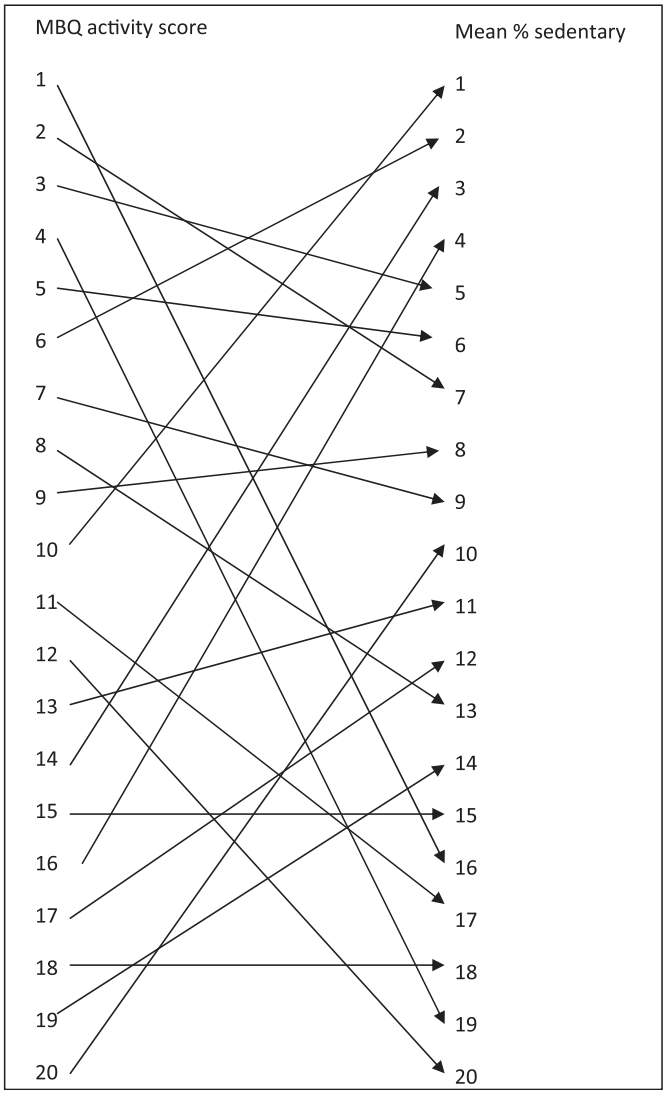
Background Self-reported physical activity equivalent to at least 2 h a week is associated with reduction in the risk of hospital admission and death in COPD.[1] However, whether self reported activity is accurate in COPD is uncertain. The gold standard objective measures of physical activity in daily life are direct observation and assessment of energy expenditure by calorimetry or the doubly labelled water method.[2] We sought to test the validity of a home activity monitor (Actigraph)—for measurement of physical activity levels by comparing to calorimetry, the 6MWT and an activity questionnaire.

Methods 20 patients with COPD and five healthy elderly subjects underwent home activity monitoring over a period of 5 days, a 6MWT and were questioned twice regarding activity levels using the modified Baecke questionnaire (MBQ).[3] Time spent non-sedentary according to the Actigraph was compared to perceived activity from the MBQ and 6MWT. A sub-group also underwent concurrent measurement of energy expenditure by indirect calorimetry and the Actigraph during a walk at steady state on a treadmill.

Results Actigraph output is summarised in Abstract P43 table 1. MBQ score did not relate to actual time active in patients ($p=0.54$), and was less reproducible on retest than in controls. Furthermore when patients were ranked according to activity level by MBQ and Actigraph, it was clear that patients both under and over-estimated their activity level. Actigraph activity levels related well to 6MWT ($p=0.04$). Accuracy of the Actigraph at measuring energy expenditure, compared to the gold standard of calorimetry, varied with walking speed, such that it was less accurate in those walking slowly.



Abstract P43 Table 1 **Relationship between MBQ score and the percentage time spent sedentary**. MBQ score was ranked from highest to lowest (1-20). The mean % time sedentary was ranked lowest to highest for the twenty patients. The arrows show how MBQ score rank related to mean % time sedentary. For example, the patient with the highest score on MBQ was ranked 16th in the % time sedentary, suggesting that they actually did less activity than they perceived they did. The patient who spent the least time sedentary perceived they did less activity than they actually did as they were ranked 10th for MBQ score. Nine patients (45%) over-estimated their activity level and nine under-estimated their activity level. Two patients were ranked the same for the MBQ as the Actigraph.

Conclusions Patients self reported activity levels are likely to be inaccurate. Home activity monitoring is accurate at measuring exercise capacity, but not at measuring energy expenditure, due to slow speed of movement.

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P44 VALIDATION OF A PEDOMETER TO MEASURE DAILY PHYSICAL ACTIVITIES IN COPD PATIENTS

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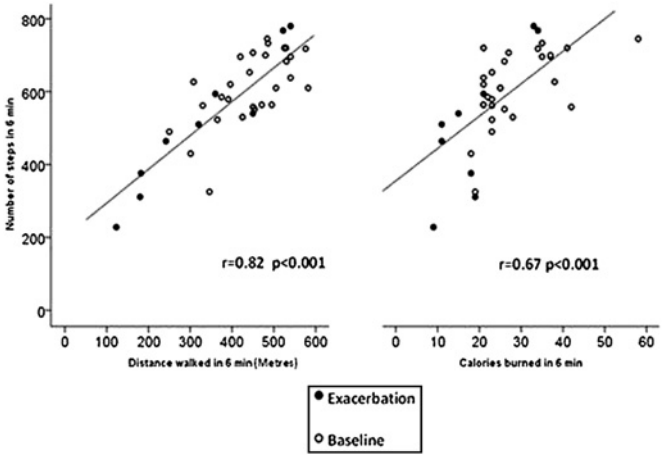
Introduction Physical activity is reduced at COPD exacerbation but there is little information on the quantification of this activity. Activity can be assessed using walking tests or questionnaires or with expensive accelerometer based monitoring devices that require regular clinic visits to download data. Both approaches are not well suited to prospectively capturing activity during an exacerbation in a large observational cohort as patients will need to be monitored continuously in order to capture the prodrome and early stages of these events. The aim of this study was to determine whether step-counts measured by a pedometer (Yamax Digi-Walker SW-200) were sufficiently correlated with other measures of physical activity prospectively, to show that the device can be used in COPD patients.
Methods Patients with COPD (n=33) wore the pedometer and a SenseWear Armband (BodyMedia, Inc.) during a 6-min walk test (6MWT). FEV_1, height, age and gender were recorded prior to the test. The pedometer was worn on a belt on the left-hand side and a SenseWear device on the left arm. Patients performed a 6MWT according to ATS protocols when stable and while having an exacerbation.
Results The 33 patients had a mean age (±SD) 71.5 (±6.2) and FEV_1 % predicted 48.2% (±13.2); 26 were men. The patients walked a mean 415 (±117) metres in 6 min, taking 587 (±132) steps and expending 26.3 calories (±9.8). Twenty-four patients completed the 6MWT when stable and five completed it during an exacerbation. Four patients were assessed at both baseline and exacerbation. Abstract P44 figure 1 shows that there was a strong correlation between steps counted by the pedometer and distance covered [r=0.82; p<0.001], and little change in this relationship between the stable and exacerbation state. The correlation was significant between steps and calories [r=0.67; p<0.001].



Abstract P44 Figure 1 Relationship between steps measured by pedometer (Yamax Digi-walker SW-200) in 6 min with distance covered and calories burned in the same period.

Conclusion Step count correlates well with 6 min walking distance and energy expenditure in COPD patients. Thus pedometers may be a useful way to prospectively monitor and quantify physical activity during COPD exacerbations in a large observational cohort.

P45 CO-MORBIDITIES IN ALPHA-1-ANTITRYPSIN DEFICIENCY

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Introduction Chronic obstructive pulmonary disease is well recognised to be a multi system inflammatory condition with systemic manifestations, including co morbidities such as diabetes, ischaemic heart disease and osteoporosis. Patients with alpha-1 antitrypsin deficiency (A1ATD) have a similar spectrum of lung disease and increased levels inflammation and recognised associations with vasculitis and panniculitis. Our aim was to characterise the co morbidities of the UK cohort of patients with A1ATD.
Methods A retrospective review of the notes of patients with the ZZ phenotype was undertaken for patients who attended the Alpha-1-Antitrypsin Deficiency Assessment and Programme for Treatment (ADAPT) Project in Birmingham, between the years 2001 and 2011.
Results 764 sets of notes were reviewed. Of the patients included, 75 had died. The most common known co morbidity encountered was hypertension (94 patients, 12.3%), followed by depression (34 patients 4.5%) and osteoporosis (40 patients 5.2%). Interestingly, 10 patients in the cohort had been diagnosed with ulcerative colitis (UC), 4 had proven factor V Leiden deficiency and 25 were hypothyroid.
Conclusion Depression and osteoporosis are recognised co morbidities in usual COPD, and are among the most common findings in the A1ATD patients, together with hypertension. The figures are lower than reported in usual COPD. There were more patients than expected who had Factor V Leiden deficiency (56 in 12 000 vs 10 in 12 000 of the UK adult population) and 11 potential patients on long-term anticoagulation in whom it was no longer possible to measure factor V Leiden. UC has a prevalence of 3–9 cases per 10 000 in the UK but our figures suggest 130 per 10 000. Finally, thyroid disease is usually more common in women, affecting 15 in 1000 in the UK. In our patient group, the incidence is double (32 in 1000). Overall, the incidence of several inflammatory/autoimmune diseases was higher than predicted for the UK population and a potential link to a coagulopathy was identified.

P46 GENDER DIFFERENCES IN THE PREVALENCE OF COMORBIDITIES IN COPD PATIENTS

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Introduction Effective recognition and appropriate management of comorbidities is an important aspect of modern COPD care. In particular, cardiovascular diseases are a leading cause of morbidity and mortality. There is increasing interest in the differential impact of gender in COPD. This study aims to characterise gender differences in the profile of comorbidities in COPD.
Methods We analysed the recruitment records of 386 well-characterised patients enrolled into the London COPD Cohort. Comorbidities, medication, age, gender, height, weight, spirometry, St George's Respiratory Questionnaire (SGRQ) and MRC dyspnoea scores were recorded.
Results There were no significant differences between females (n=164) and males (n=222) in terms of mean ± SD age; 67.5±8.3 vs 69.0±9.0 years, p=0.102, median (IQR) smoking pack year history 47 (27–62) vs 44 (27–65), p=0.769 or body mass index 25.3 (22.1–29.4) vs 25.5 (22.8–29.0), p=0.311. Females had milder airflow limitation at recruitment with a higher mean ± SD FEV_1 %