

**P76 THE EFFECT OF OUTSIDE TEMPERATURE ON DAILY PHYSICAL ACTIVITY IN COPD PATIENTS**

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**Introduction** COPD is characterised by breathlessness, leading to reduced physical activity. Breathlessness varies dependent upon the degree and intensity of physical activity (1). Common logic dictates that weather variation such as temperature and sunshine could influence physical activity in the general population, especially walking. The aims of this study were to evaluate the effect of weather variation on daily activity and the variation in activity during the days of the week in COPD patients.

**Methods** Fifty-five stable COPD outpatients from the London COPD cohort wore a pedometer (Yamax Digi-Walker SW-200) daily for 30 days during waking hours. We excluded exacerbating patients and those using walking sticks or oxygen. All patients were asked to record their step count on daily diary cards. Weather data for London Heathrow were obtained with permission from the British Atmospheric Data Centre. Stable COPD was defined as having no symptom-defined exacerbations in the preceding six weeks and subsequent two weeks, according to prospectively-collected diary cards, with no change in long-term inhaled and oral medications in the preceding two weeks.

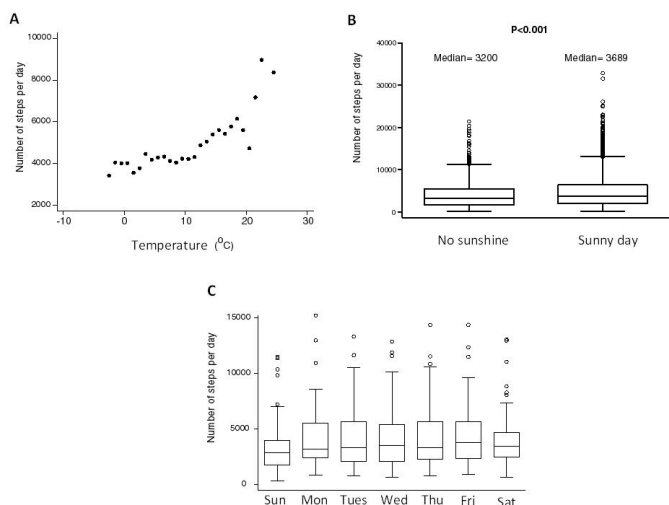
**Results** The clinical characteristics of the 55 patients were mean ( $\pm$ SD) age 70.3 (8.7) years; FEV<sub>1</sub>% predicted 51.0% ( $\pm$ 14.1); male gender 67%; current smoker 25%, BMI 27.2 kg/m<sup>2</sup>. The mean ( $\pm$ SD) daily step count was 4327 ( $\pm$ 2944).

COPD patients were more active as temperatures increased (Figure 1A) and on sunny as opposed to no sunshine days (Figure 1B,  $p < 0.001$ ). Figure 1C shows that mean weekday activity is significantly higher than mean weekend activity ( $p < 0.001$ ), mainly due to less activity on Sunday.

**Conclusion** Daily activity in stable COPD markedly affected by outdoor temperature and sunshine and patients had highest activity during weekdays. Further work is required to ascertain whether some patients are more active than others.

**Reference**

1. Pitta F *et al.*, Quantifying Physical Activity in Daily Life with Questionnaires and Motion Sensors in COPD, ERJ 27, no. 5 (April 2006): 1040-1055.



Abstract 76 Figure 1

**P77 THE SHORT PHYSICAL PERFORMANCE BATTERY IS ASSOCIATED WITH PERIPHERAL MUSCLE DYSFUNCTION AND PHYSICAL ACTIVITY IN COPD**

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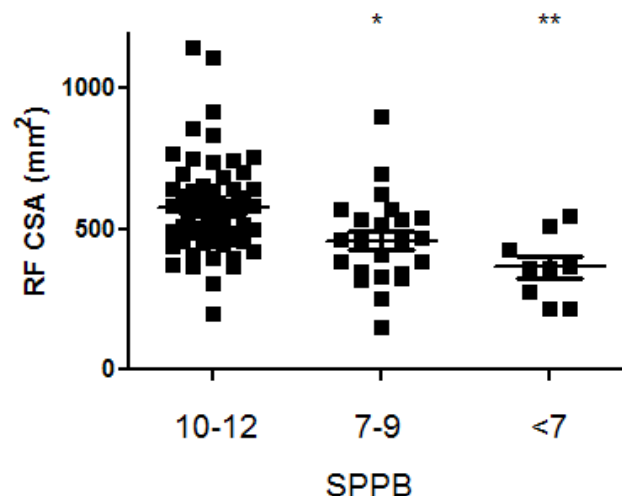
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**Introduction and Objectives** Quadriceps muscle dysfunction and physical activity independently predict patient related outcomes including mortality in COPD. However, direct measurements in clinical practise are limited by time constraints, expertise and expense. The Short Physical Performance Battery (SPPB) is a simple objective tool scored out of 12, that evaluates lower extremity function by composite assessment of standing balance, habitual gait speed and timed sit-to-stand. Whilst the SPPB is predictive of adverse outcomes including nursing home admission and mortality in general populations, limited data are available in COPD; the relationship between the SPPB and exercise performance, peripheral muscle strength, muscle bulk and physical activity is of particular interest. We hypothesised that SPPB performance would relate to functional exercise performance, quadriceps strength, quadriceps bulk and physical activity.

**Methods** SPPB data was collected in 109 stable COPD patients (64M:45F). Other measurements included spirometry, body mass index (BMI), fat free mass (FFM) by bioelectrical impedance, six-minute walk test distance (6MWT), quadriceps muscle strength by volitional (QMVC) and non-volitional techniques (TwQ) and cross-sectional area of the rectus femoris by ultrasound (RF<sub>CSA</sub>). Physical activity level (PAL) was determined by the Sensewear armband worn over a 7 day period.

**Results** There was no relationship between SPPB performance and FEV<sub>1</sub>% predicted or BMI. Whilst SPPB performance correlated weakly with age ( $r = -0.21$ ,  $p = 0.03$ ) and FFMI ( $r = 0.21$ ,  $p = 0.03$ ) a stronger relationship was seen with PAL ( $r = 0.48$ ,  $p < 0.0001$ ), 6MWT ( $r = 0.64$ ,  $p < 0.0001$ ), RF<sub>CSA</sub> ( $r = 0.45$ ,  $p < 0.0001$ ), QMVC/BMI ( $r = 0.41$ ,  $p < 0.0001$ ) and TwQ ( $r = 0.44$ ,  $p = 0.004$ ). Stratifying according to SPPB identified those with reduced quadriceps bulk (see figure 1), QMVC/BMI and physical activity.

**Conclusions** In COPD, SPPB performance is not related to lung function impairment. It detects those who are less active and those with reduced peripheral muscle strength and bulk. The SPPB may be a useful tool in predicting COPD patients at greater risk of future adverse events and those suitable for intervention.



Abstract P77 Figure 1 Reduced quadriceps bulk in those with lower SPPB scores