Daily physical activity in subjects with newly diagnosed COPD

Rationale  Information about daily physical activity levels (PAL) in subjects with undiagnosed chronic obstructive pulmonary disease (COPD) is scarce. This study aims to assess PA and to investigate the associations between PA and clinical characteristics in subjects with newly diagnosed COPD.

Methods  Fifty-nine subjects with a new spirometry-based diagnosis of mild (n=38) and moderate (n=21) COPD (63±6 years, 68% male) were matched with 65 smoking controls (62±7 years, 75% male). PA (daily steps, time spent in moderate-to-vigorous physical activity (MVPA) and PAL) was measured by actigraphy. Dyspnoea, complete pulmonary function tests, peripheral muscle strength and exercise capacity served as clinical characteristics.

Results  PA was significantly lower in COPD versus smoking controls (7986±2648 vs 9765±3078 steps, daily time spent in moderate-to-vigorous physical activity (MVPA) (B) 64 (27–120) vs 110 (55–164) min of MVPA, P=0.049 vs 1.62±0.24 PAL respectively, all p<0.05). Subjects with COPD with either mild symptoms of dyspnoea (mMRC 1), those with lower diffusion capacity (T1co), low 6 min walking distance (6MWD) or low maximal oxygen uptake (VO2 peak) had significantly lower PA. Multiple regression analysis identified 6MWD and T1co as independent predictors of PA in COPD.

Conclusions  The reduction in PA starts early in the disease, even when subjects are not yet diagnosed with COPD. Inactivity is more pronounced in subjects with mild symptoms of COPD with either mild symptoms of dyspnoea (mMRC 1), those with lower diffusion capacity (T1co), low 6 min walking distance (6MWD) or low maximal oxygen uptake (VO2 peak) had significantly lower PALs (see online supplementary figure S2–S5). COPD subjects and smoking controls with lower levels of isometric quadriceps force did not show lower daily PALs. Multiple regression analysis identified 6MWD and T1co as independent predictors of physical activity in COPD (see online supplementary table S2).

Our data support the recent advice of Centers for Disease Control and Prevention that physical activity is an important vital sign, even in patients with mild disease.

Several cross-sectional studies found that patients with an established diagnosis of mild-to-moderate COPD, recruited in hospital outpatient settings, were physically inactive compared to a (non-) smoking control group. This is the first study that showed that early reduction in physical activity is already present in subjects with mild-to-moderate COPD who did not previously present to healthcare services (ie, preclinical stage). Of importance to clinicians is the finding that some clinical characteristics (mild symptoms of dyspnoea, low values of diffusion capacity and exercise capacity) may identify the inactive subjects. In this group, early therapeutic interventions such as activity counselling programmes could be helpful in preventing deterioration of the PALs, and by consequence, other clinical outcomes such as comorbidity and disease progression. We conclude that the reduction in physical activity starts early in the disease, even when subjects are not yet diagnosed with COPD.
diagnosed with COPD, especially in those with mild symptoms of dyspnoea, lower levels of diffusion capacity and exercise capacity.

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