Daily activity patterns and the effect of energy conservation advice in clients with chronic obstructive pulmonary disease

Key findings
- Daily activity patterns in patients with Chronic Obstructive Airways Disease (COPD) vary widely but they can be measured and plotted using the SenseWear activity monitor.
- Monitors were well tolerated by the study subjects with high compliance rates.
- The SenseWear monitor was able to provide informative plots of daily activity in the form of minutes of daily activity, steps taken and estimated energy expenditure over any given time point.
- Daily activity levels were not found to be predicted by factors such as age, lung function or exercise test performance.
- Levels of peak activity were noted in all subjects’ daily activity profiles and the number of minutes of peak activity varied between subjects.
- There was a trend for patients to record fewer steps following energy conservation advice. However changes in all outcome measures did not reach statistical significance.
- This study has generated outcome data that could be used to calculate the power any future randomised controlled trial.

Project aims
The daily lives of patients with Chronic Obstructive Airways Disease (COPD) are affected by problems of breathlessness and fatigue. This pilot study had two aims:
1. To describe the profile of daily activity of clients with COPD using activity monitors and to establish if clients with COPD routinely pace activity or are forced to perform basic activities of daily living (ADL) at peak exercise levels and then have to rest for long periods.
2. To establish if energy conservation advice has any impact upon a COPD patient’s daily routine as measured by an activity monitor and the Canadian Occupational Performance Measure (COPM).

Background
Chronic Obstructive Pulmonary Disease (COPD) is a major cause of disability in the United Kingdom. Pulmonary rehabilitation (PR) has been shown to improve physical activity in clients with COPD and is recommended as an essential element in the management of COPD.

Occupational therapists have long been involved in treatment and management strategies for patients with COPD including pulmonary rehabilitation programmes.

Energy conservation advice, delivered by occupational therapists, is an integral part of Pulmonary Rehabilitation (PR) education programmes. It is assumed that clients with Chronic Obstructive Pulmonary Disease (COPD) require energy conservation advice in order to attain optimum levels of independence in activities of daily living (ADL). However the exact patterns of daily activity have not been previously measured in the COPD population. Similarly, the effect of energy conservation advice has not been explored.
Methodology

Daily activity levels are difficult to measure (Pitta et al 2006). In a response to this activity monitors are increasingly being viewed as a valid and reliable tool in order to objectively measure physical activity levels in a patient’s home environment. Movement detectors and in particular, accelerometers have been used in PR (Pitta et al 2006) and are able to accurately measure activity in a COPD population. Activity monitors have not however been widely used to investigate occupational therapy intervention.

A total of 20 patients with COPD were recruited from the Pulmonary Rehabilitation assessment clinic, Glenfield Hospital, Leicester from May 2009 to October 2009. The primary outcome measure was a SenseWear Activity Monitor and subjects were instructed to wear the monitor for five consecutive days at each time point of the study. Secondary outcome measures were the Incremental Shuttle Walking Test (Singh et al 1992) and the Canadian Occupational Performance Measure (Law et al 1998).

After baseline measurements, patients received standardised one-to-one energy conservation advice and then went on to complete a programme of Pulmonary Rehabilitation (two hours, one of which was exercise and one was education, twice a week for seven weeks).

Recommendations for research

- Occupational therapists should consider each individual patient’s need for energy conservation advice as daily activity profiles vary widely.
- This study has shown that activity monitors are able to measure levels of daily activity and should be considered as an important outcome measure in future studies of energy conservation advice in patients with COPD.
- Future studies of energy conservation advice should include a self-perceived measure of fatigue.
- Further research is required to help us understand how occupational therapists can establish and develop evidence-based practice in the field of chronic respiratory disease. Specifically, an adequately powered randomised controlled trial of energy conservation advice should be completed so that the efficacy of this occupational therapy intervention can be explored.

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References

