**SUMMARY**

Exercise training constitutes the cornerstone of pulmonary rehabilitation as there is strong evidence that its implementation improves both exercise tolerance and health-related quality of life in COPD patients [1]. The intensity of exercise is a key determinant of true physiological training effects. In order to optimize the outcome, it is necessary that the intensity of exercise is as high as possible [2]. However, in patients with severe COPD, intolerable sensations of breathlessness and/or peripheral muscle discomfort may prevent high-intensity levels to be tolerated for sufficiently long periods of time to yield true physiological training effects [3].

When exercising continuously without any rest periods, severe COPD patients can tolerate relatively moderate work rates (50–80% of their maximum exercise capacity) for approximately 5-13 min, at the end of which they are symptom limited [4]. At intensities of 75-85% of peak exercise capacity, COPD patients can sustain only 4-5 min of exercise [4] and only up to 13 min for lower intensities (50–60% of peak exercise capacity) [4]. As such, implementing continuous exercise training for patients with severe COPD may prove ineffective, as they will have to interrupt exercise in order to rest for several minutes before they start exercising again.

Consequently, it is important to implement strategies to optimize exercise tolerance in severe COPD with the objective of enhancing the patient’s ability to tolerate as sustained and intense workloads as possible. These strategies aim at reducing the intensity of dyspnoea sensations, either by allowing patients to sustain a higher absolute exercise-training intensity or by prolonging the cumulative time a given exercise task can ordinarily be sustained. Such a strategy includes interval training.

Vogiatzis et al. [5] have shown that using interval exercise, patients with severe COPD can almost triple the total exercise duration with significantly lower and more stable metabolic and ventilatory responses compared with continuous exercise. Although patients exercise for longer time (30 min) at a higher intensity (100% of peak exercise capacity) with the interval mode, they have lower metabolic demands and less ventilatory restrictions at the end of an interval training session [5].

Accordingly, interval training may enable patients to complete short periods of high-intensity exercise that would not be possible with a continuous exercise mode. When patients exercise for short periods of time (e.g. 30 s) alternated with short rest intervals of 30 s, they complete the total work with moderate exertion and relatively stable metabolic and ventilatory response [4, 6]. Indeed, patients with severe COPD can endure high-intensity interval training in the rehabilitation setting for long periods of time with lower symptoms of dyspnoea and leg discomfort compared with the conventionally implemented continuous training [7-10]. A recent study demonstrated that interval exercise training allows severe COPD patients to exercise at a sufficiently high intensity to obtain true physiological training effects manifested by improvements in muscle fibre size, typology and capillarization [11].
REFERENCES


