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Interval hypoxic training improves autonomic cardiovascular and respiratory control in patients with mild chronic obstructive pulmonary disease.

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Comment in

- Effects of hypoxia on blood pressure regulation: interval hypoxic training as compared to obstructive sleep apnea - the other side of the coin? [J Hypertens. 2009]

Abstract

OBJECTIVES:

Chronic obstructive pulmonary disease (COPD) is associated with cardiac autonomic nervous system dysregulation. This study evaluates the effects of interval hypoxic training on cardiovascular and respiratory control in patients with mild COPD.

METHODS:

In 18 eucapnic normoxic mild COPD patients (age 51.7 +/- 2.4 years, mean +/- SEM), randomly assigned to either training or placebo group, and 14 age-matched healthy controls (47.7 +/- 2.8 years), we monitored end-tidal carbon dioxide, airway flow, arterial oxygen saturation, electrocardiogram, and continuous noninvasive blood pressure at rest, during progressive hypercapnic hyperoxia and isocapnic hypoxia to compare baroreflex sensitivity to hypoxia and hypercapnia before and after 3 weeks of hypoxic training. In double-blind fashion, both groups received 15 sessions of passive intermittent hypoxia (training group) or normoxia (placebo group). For the hypoxia group, each session consisted of three to five hypoxic (15-12% oxygen) periods (3-5 min) with 3-min normoxic intervals. The placebo group inhaled normoxic air.

RESULTS:

Before training, COPD patients showed depressed baroreflex sensitivity, as compared with healthy individuals, without evident chemoreflex abnormalities. After training, in contrast to placebo group, the training group showed increased ($P < 0.05$) baroreflex sensitivity up to normal levels and selectively increased hypercapnic ventilatory response ($P < 0.05$),

without changes in hypoxic ventilatory response.

CONCLUSION:

Eucapnic normoxic mild COPD patients already showed signs of cardiovascular autonomic abnormalities at baseline, which normalized with hypoxic training. If confirmed in more severe patients, interval hypoxic training may be a therapeutic strategy to rebalance early autonomic dysfunction in COPD patients.
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