

Short Term of Intermittent Hypoxic Training Improves Lung Function and Cardiovascular Endurance in People with Cardiovascular Risk Factors

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ABSTRACT

Over the decades, Intermittent hypoxic training (IHT) has been shown to improve physical fitness in several athletes, healthy and obese persons. However, its effect on patients with a risk of CVD remained under investigation. Therefore, the study aimed to evaluate the effects of a 6-week of intermittent hypoxic (IH) programs on lung function and cardiovascular endurance in subjects with cardiovascular risk factors.

Thirty subjects with cardiovascular risks (hypertension, hyperlipidemia, and overweight) participate in this study. All subjects were randomly allocated into 3 different groups: an intermittent hypoxic exposure group (IHR, n=9), an intermittent hypoxic training group (IHT, n=10), and a control group that received no intervention. Both experimental groups trained twice a week for 6 consecutive weeks. While IHT underwent a combined walking exercise on a motorized treadmill 35%-50% of HRR) and 8 sessions of 3 mins of hypoxic breathing (14% O₂) alternated with 3 mins of normoxic breathing (21% O₂) for 48 minutes per day, the IHR exposed to hypoxia only. Lung function and 6-minute walk test (6MWD) were measured before and after 6 weeks of the intervention period.

After training, while IHR showed significantly increased mean values of % predicted VC (83.7±4.0 vs 80.6±4.5) and FVC (81.8±4.9 vs 76.7±7.0). IHT revealed significant increases in mean values of % predicted VC (80.65.5 vs 86.0±4.5), FVC (78.4±5.4 vs 83.5±4.7), and FEV₁ (76.6± 6.2 vs 81.7± 5.6) compared to CON (all, *p*<0.05). In addition, both IHR and IHT demonstrated a significantly increased 6MWD (549.0±32.7 m and 579.0±56.5 m, respectively, *p*<0.05) compared to CON (501.5±40.3 m) after 6 weeks of the intervention.

The present study showed that both IH programs over 6 weeks periods elicit similar improvements in lung function and cardiovascular endurance compared to control. This suggests that the IH can be used as an alternative strategy to improve exercise capacity in subjects with cardiovascular risk factors.

Keywords: Hypoxic exposure; Lung volumes; 6-minute walk test; Hypertension; Hyperlipidemia; Overweight

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