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Title: Respiratory muscle endurance training (RMET) with normocapnic hyperpnea (NH) improves ventilatory function and exercise performance in triathletes

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Body: Recent studies show that RMET reduces dyspnea perception, improves exercise performance and decreases VE during exercise in healthy subjects. Aim: To evaluate the effect of 5 weeks of RMET with NH by means of Spirotiger® on respiratory function, cycling and running performance in triathletes. Methods: 15M triathletes (aged 21-43) were allocated in 2 groups: RMET (10M) and Control (5M) group. At baseline (T0) athletes underwent: pulmonary function tests (FEV1, FVC, MIP, MVV) and exercise tests (maximal incremental and endurance cardiopulmonary tests performed with both cycle ergometer and treadmill) and repeated the same tests after 5 weeks (T1). RMET group trained at home for 5 weeks: 20 min daily at the same ventilation level measured at the RC point during incremental test. Between T0 and T1 all subjects maintained the same training program. Results are reported in Table1. The trend of VO₂, VE and RR showed lower values after RMET (p<0,05; ANOVA test). No change was found in control group.

Table1

Mean±SD	FEV1 (%)	FVC (%)	MIP (cmH ₂ O)	MVV (l/min)	Max Watt	Max Speed (Km/h)	Borg dyspnea endurance test
T0	114±9	120±10	93±29	213±17	389±106	18±2	7/10±0,7
T1	115±11	120±10	97±25*	231±18*	429±119*	19±2*	6/10±0,5*

*p<0,05; T test

Conclusion: RMET significantly improves MIP and MVV in triathletes and increases exercise performance. Furthermore the VE becomes more efficient as shown by the reduction of VE, RR and by the lower dyspnea Borg score; the new data is the lower trend of VO₂ during incremental test.