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Title: Respiratory muscle training (REMT) with normocapnic hyperpnoea (NH) improves respiratory muscle strength, exercise performance and ventilatory pattern in COPD patients

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Body: Few data are available about the effect of RMET in COPD patients even if it has been shown that RMET improves endurance performance and decreases VE during exercise in healthy subjects. Aim: To evaluate the effect of 4 weeks of RMET with NH (Spirotiger®) on respiratory function and exercise capacity in 23 moderate/severe COPD patients. Materials and Methods: 20 M, 3 F (aged 42-80). Respiratory function tests (FEV1, FVC, MIP), QoL (St George's Questionnaire), 6MWT and endurance exercise test (75-80% of peak-work rate measured during an incremental test and performed to the limit of tolerance, tLIM). 9 of 21 patients were instrumented with a portable inductive plethysmography (Lifeshirt System) to evaluate breathing pattern during exercise test. After 4 supervised training sessions, the patients trained at home for 4 weeks: 10 min twice a day roughly at 55% of MVV (FEV1x0,375). Results are reported in Tab.1 and Tab.2. 6 patients dropped out (poor compliance). Ventilatory pattern after RMT, during tLIM, is characterized by a significantly lower trend of VE and RR with a higher TV (p<0,05, ANOVA test).

Tab.1

Mean±SD	FEV1 (%)	FVC (%)	MIP (cmH2O)	QoL (total)	6MWD (m)	SpO2 (%)
pre RMET	59,1±16,5	81,0±21,1	84±33	29,2±18,0	422±74	92±3
post RMET	59,1±15,3	82,5±22,9	93±33*	21,2±12,3*	459±55*	93±2*

Tab.2

Mean±SD	tLIM (sec)	Borg dyspnea tLIM
pre RMET	351± 238	8/10±0,6

post RMET	523±440*	6/10±1,7*
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*p<0,05 (T test and Wilcoxon signed rank test)

Conclusion: After a short RMT, COPD patients show an improvement in MIP, QoL, a higher exercise capacity and an intriguing change in ventilatory pattern during exercise, which improves SpO₂.