Effects of counterpressure breathing with steam inhalation on lung function in stable asthma

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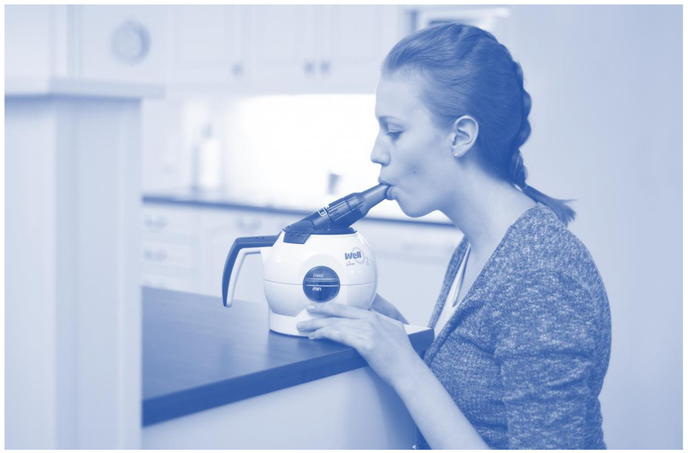
INTRODUCTION

Intensive counterpressure breathing regimes improve lung function of asthmatics. However, the effects of the low or moderate load regimes are less studied.

Our aim was to study the effects of the low stressing respiratory muscle training (RMT) with steam inhalation on lung function of patients with pharmacologically treated asthma



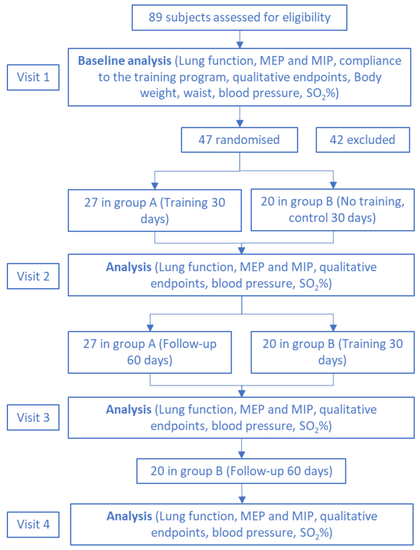
RMT was done at home with the WellO$_2$™ device, which also generates water steam into the airways. The RMT program included 20 daily ex- and inhales for four weeks with the counter pressure set to 30% of the individual MEP value.

METHODS

Study design: A randomized, controlled, single-blind, clinical trial.

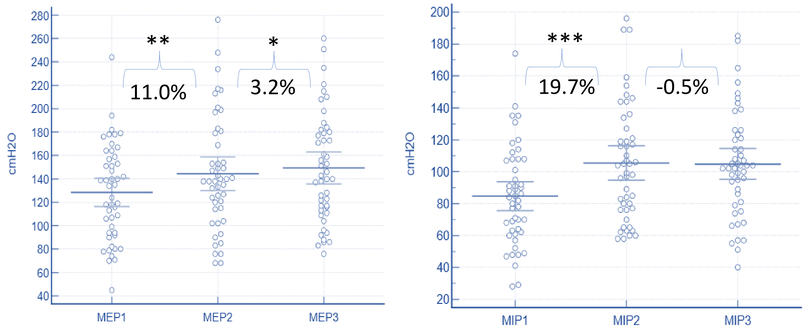
Subjects: Patients (n=47) with mild to moderate asthma were recruited to the study from the vicinity of city of Tampere, Finland. The asthma diagnosis was based on ATS/ERS guidelines by showing reversible airway obstruction in spirometry, significant PEF-variability for two weeks, or moderate or severe bronchial hyperresponsiveness to inhaled histamine or methacholine or exercise.

Endpoints: Spirometry with bronchodilatation test, MEP and MIP, Pulse oximetry, pulse rate, heart rate, arterial blood pressure, body weight and waist, and several questionnaires related to the perceived symptoms after the RMT protocol.



RESULTS

Baseline values of the lung function in the groups were comparative. The following endpoints increased significantly more in the group A than in the group B: MEP (mean +12.4 %, vs. +3,5%, p<0,05), MIP (mean +20.1 % vs. + 0.82%, p<0,05), VC (mean +3.7 % vs. 1.5%, p<0,05), and forced expiratory time (FET) (mean +15.5%, vs. -5,0%, p<0,05). In the group A, the increases from the baseline were very significant: MEP (p<0.010), MIP (p<0.001), VC (p<0.001), and FET (p<0.001). No side effects due to the intervention were observed.



The graphics shows the distribution of the MEP and MIP observations, statistical significance between the visits as analysed with the two-tailed and paired T:test (p<0,05 *, p<0,01 **, p<0,001 ***), percentage difference of the mean values (black bars), and 95% confidence interval (grey bars) of each group of the observations. MEP: maximal expiratory pressure, and MIP: maximal inspiratory pressure at visits 1, 2 and 3.

The first author is a minor shareholder of WellO2 Ltd. The other authors declare no conflict of interests.

Low stressing RMT with the steam inhalation increases respiratory muscle power, VC and FET in patients with stable asthma on their normal lung medication.