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Controlling Asthma by Training of Capnometry-Assisted Hypoventilation (CATCH) Versus Slow Breathing: A Randomized Controlled Trial.

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Abstract

ABSTRACT:
Background:Hyperventilation has been associated with adverse effects on lung function, symptoms, and well-being in asthma. We examined whether raising end-tidal carbon-dioxide levels (PCO2), compared to slow breathing, was associated with improvements in asthma control, including peak-flow variability. Method:120 asthma patients were randomly assigned to capnometry-assisted respiratory training (CART) for raising PCO2 or slowing respiratory rate (SLOW). Patients received five weekly sessions and completed twice-daily homework exercises over 4 weeks. Blinded assessments at baseline, posttreatment, 1-month and 6-months follow-up of asthma control, PCO2, and diurnal peak-flow variability were primary outcome measures. Additionally, we measured pulmonary function (spirometry, forced oscillation, exhaled nitric oxide, methacholine challenge), symptoms, quality of life, and bronchodilator use. Because the control group received an active treatment, we expected improvements in asthma control in both groups, but more pronounced benefits from CART. Results:Improvements were seen in 17 of 21 clinical indices (81.0%) in both interventions, including the primary outcome variables asthma control (d=.81), peak-flow variability (d=.54), quality of life, bronchodilator use, lung function, and airway hyperreactivity. Most improvements were sustained across 6-month follow-up. Compared with slow breathing, CART showed greater increases in PCO2 (CART: d=1.45 vs. SLOW: d=.64) and greater reductions in respiratory impedance during treatment, less distress during methacholine challenge, and greater reduction in asthma symptoms at follow-up (Ps<.05). Conclusions:Brief interventions aimed at raising PCO2 or slowing respiratory rate provide significant, sustained, and clinically meaningful improvements in asthma control. Raising PCO2 was associated with greater benefits in aspects of lung function and long-term symptoms. Trial Registration:clinicaltrials.gov Identifier: NCT00975273.

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CONCLUSIONS:
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