A combined Inspiratory and Expiratory Muscle Training Program Improves Respiratory Muscle Strength and Fatigue in Multiple Sclerosis

Ray AD, Udhoji S, Mashtare TL, Fisher NM.

Department of Rehabilitation Science, School of Public Health and Health Professions, University at Buffalo, Buffalo, NY.

Abstract

OBJECTIVE:

To determine the effects of a short-duration, combined (inspiratory and expiratory), progressive resistance respiratory muscle training (RMT) protocol on respiratory muscle strength, fatigue, health-related quality of life, and functional performance in individuals with mild-to-moderate multiple sclerosis (MS).

DESIGN:

Quasi-experimental before-after trial.

SETTING:

University rehabilitation research laboratory.

PARTICIPANTS:

Volunteers with MS (N=21) were divided into 2 groups: RMT (n=11; 9 women, 2 men; mean age ± SD, 50.9±5.7y, mean Expanded Disability Status Scale score ± SD, 3.2±1.9) and a control group that did not train (n=10; 7 women, 3 men; mean age ± SD, 56.2±8.8y, mean Expanded Disability Status Scale score ± SD, 4.4±2.1). Expanded Disability Status Scale scores ranged from 1 to ≤6.5. No patients withdrew from the study.

INTERVENTION:

Training was a 5-week combined progressive resistance RMT program, 3d/wk, 30 minutes per session.

MAIN OUTCOME MEASURES:

The primary outcome measures were maximal inspiratory pressure and expiratory pressure and the Modified Fatigue Impact Scale. All subjects completed secondary measures of pulmonary function, the six-minute walk test, the timed stair climb, the Multiple Sclerosis Self-Efficacy Scale, the Medical Outcomes Study 36-Item Short-Form Health Survey, and the Physical Activity Disability Scale.

RESULTS:

Maximal inspiratory pressure and expiratory pressure (mean ± SD) increased 35%±22% (P<.001) and 26%±17% (P<.001), respectively, whereas no changes were noted in the control group (12%±23% and -4%±17%, respectively). RMT improved fatigue (Modified Fatigue Impact Scale, P<.029), with no change or worsening in the control group. No changes were noted in the six-minute walk test, stair climb, Multiple Sclerosis Self-Efficacy Scale, or Physical Activity Disability Scale in the RMT group. The control group had decreases in emotional well-being and general health (Medical Outcomes Study 36-Item Short-Form Health Survey).

CONCLUSIONS:

A short-duration, combined RMT program improved inspiratory and expiratory muscle strength and reduced fatigue in patients with mild to moderate MS.

KEYWORDS:

6MWT, ATS, American Thoracic Society, Breathing exercises, EDSS, Expanded Disability Status Scale, FEV(1), FVC, Fatigue, HRQOL, MFIS, MS, MSSE, MVV(12), Medical Outcomes Study 36-Item Short-Form Health Survey, Modified Fatigue Impact Scale, Multiple Sclerosis Self-Efficacy Scale, Multiple sclerosis, PFT, Pemax, Pimax, Positive-pressure respiration, RMT, Rehabilitation, SF-36, forced expiratory volume in 1 second, forced vital capacity, health-related quality of life, maximal expiratory pressure, maximal inspiratory pressure, maximal voluntary ventilation in 12 seconds, multiple sclerosis, pulmonary function test, respiratory muscle training, six-minute walk test

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Jedná se o zajímavou studii věnující se pacientům s lehkým či středně těžkým postižením (průměrné EDSS 3.2), kteří klinicky neměli žádné větší obtíže stran plicních funkcí. Přesto prošli 5 kombinovaným inspiračním a expiračním odporovým domácím tréninkem (pomocí dechových trenažerů), po kterém se zmírnila únava (v testu Modified Fatique Impact Scale), kvalita života (dle testu HRQOL - health related quality of life). Kombinovaný trénink neměl vliv na zlepšení rychlosti chůze v testu 6MWT (šestiminutový test chůze).

(Český komentář: MUDr. Martina Kövári)