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Effect of neuromuscular electrical nerve stimulation in moderate to severe Chronic Obstructive Pulmonary Disease patients—A pilot study

Randall Debattista
University of Malta, Malta

Neuromuscular electrical nerve stimulation (NMES) is a new modality being investigated for its effect related to quadriceps strength and walking distance in chronic obstructive pulmonary disease (COPD) patients. The purpose of this small pilot study was to observe and absorb as much information possible on the methodology and learning outcomes. Information from this small pilot study would present recommendations for the possibility of a larger national study regarding this new modality. For this aim, a mixed method approach was deemed appropriate. A total of seven moderate to severe COPD patients were included in this feasibility study, four in the experimental group and three in the control group. Following patient consent, the quadriceps strength as well as a 6-minute walk test (6MWT) was completed. The objective measures were taken at the baseline of this study, i.e. week four and week eight. Positive outcomes were reported in all subjects with the experimental group benefitting the most. However, the results are insignificant in view of the small population sampling. A self-designed questionnaire was distributed to the experimental group at the end of the study, with the aim to get a better view on how patients felt during the duration of NMES. Constant feedback was kept during the study duration between the researcher, intermediary physiotherapist and the subjects. Constant feedback and the results from the questionnaire were important for the researcher to present recommendations based on the strength, limitations and learning outcomes. This feasibility study provided guidance for larger more randomized national studies to maximize the benefits of NMES in COPD patients.

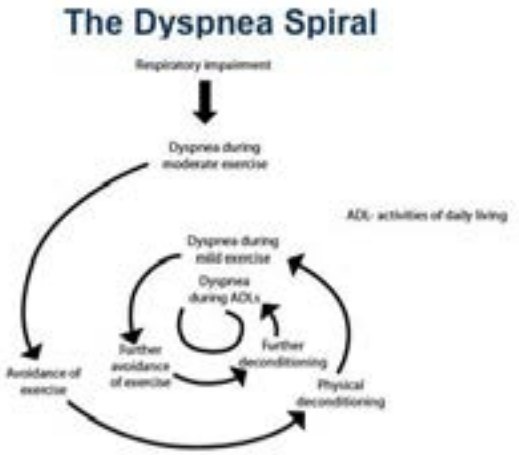

Figure 1: HAAS, F.; SALAZAR-SCHICCHI, J.; AXEN, K. Desensitization to Dyspnoea in Chronic Obstructive Pulmonary Disease (1993). In: Casaburi, R.; Petty, TL., editors. Principles and Practice of Pulmonary Rehabilitation. Philadelphia: W. B. Saundes; 241-251.

Recent Publications

1. Madocks M, Nolan C, Man W, Polkey M, Hart N, et al. (2016) Neuromuscular electrical stimulation to improve exercise capacity in patients with severe COPD: a randomised double-blind, placebo-controlled trial. The Lancet Respiratory Medicine 4(1):27–36.
2. Kharbanda, Krishnan S and Ramakrishna A (2015) Prevalence of quadriceps muscle weakness in patients with COPD and its association with disease severity. International Journal of Chronic Obstructive Pulmonary Disease 1727.

3. Giavedoni S, Deans A, Mccaughtey P, Drost E, Macnee W, et al. (2012) Neuromuscular electrical stimulation prevents muscle function deterioration in exacerbated COPD: A pilot study. Respiratory Medicine 106(10):1429–1434.
4. Abdellaoui A, Prefaut C, Gouzi F, Couillard A, Coisy-Quivy M, et al. (2011) Skeletal muscle effects of electrostimulation after COPD exacerbation: a pilot study. European Respiratory Journal 38(4):781–788.
5. Maffiuletti N (2010) Physiological and methodological considerations for the use of neuromuscular electrical stimulation. European Journal of Applied Physiology 110(2):223–234.

Biography

Randall Debattista is a Junior Physiotherapist in University of Malta with special interest in Respiratory Physiotherapy. He is currently working at the main Rehabilitation Hospital on the Maltese Islands. His interest in Pulmonary Rehabilitation inspired him to look into further details with regards to new modalities which are being investigated in order to help patients with respiratory complications, mainly COPD. He is aiming to further his studies in this field especially looking more in depth with regards to the use of NMES in COPD patients.

randalldebattista@gmail.com

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