exsufflation (MI-E) has been proven to be efficient in improving airway clearance, however data related to the outcome of its long-term use is lacking. The purpose of this study was to evaluate the efficacy of Home MIE according to bulbar muscle function, ventilatory dependence, MIE experience and pattern of usage.
Methods: Patients were recruited from the neuromuscular clinic of the Pulmonology Department of Hospital São João, Porto. Inclusion criteria were neuromuscular disorder diagnosis with home MI-E prescription for at least 3 months and baseline PCF < 270 l/min. Exclusion criteria were medical instability and known chronic lung disease. Patients were followed up for three months and weekly MIE generated expiratory flows (MIE-EF) as well as MIE compliance were recorded by analyzing the device memory card download. Home MIE data was correlated with ventilatory impairment, bulbar muscle function and months of experience with the technique.
Results: A total of 18 NMD patients (50% males) with a mean age of 33.3 ± 25.1 years were enrolled. Five patients (27.8%) had mild to moderate bulbar dysfunction, 5 (27.8%) had severe bulbar dysfunction, 2 (11.1%) had severe bulbar dysfunction with spasticity and 6 patients (33.3%) had a tracheostomy for a mean time of 63.4 ± 44.6 months). Nine patients (50%) were ventilated 24h/day, 5 (27.8%) were ventilated < 16h/day and 2 (11.1%) were not ventilated. The mean MI-E Insufflation/exsufflation pressures were 46 ± 8/46 ± 8 cmH_2O, respectively, mean usage was 3.22 ± 2.5 times per day and 102.2 ± 83.2 times per month in all patients. We found no correlation between MIE usage per month and bulbar muscle function or ventilatory dependence, however patients with tracheostomy use more times MIE per week (18 ± 4 versus 33.6 ± 11.9). We found no correlation between usage pattern and the difference in the MIE-EF in the 3 months. The mean MIE-EF in all patients was 167.7 ± 73.5 L/min with no significant differences according to bulbar function. Patients with tracheostomy had a significant lower MIE-EF (121.4 ± 62.7 L/min, p < 0.005) when compared to bulbar patients without spasticity. Although there were no significant differences in MIE-EF values in the 3 months of recording, patients using MI-E ≥ 3 years increased MIE-EF in 59 l/min, patients doing MI-E from 1 to 2 years increased MIE-EF in 18.6 l/min and patients doing MI-E < 1 year decreased MIE-EF in 5.5 l/min (p = 0.009). No complications related to MIE were reported during the study period.
Conclusions: Home use of MI-E is safe and effective in compliant NMD patients. The physiological and clinical outcomes of home MIE seem not to be dependent on ventilatory impairment or bulbar function, however patients with spasticity and tracheostomy have lower MIE-EF. Moreover, MIE years of experience seems to have clinical impact on the efficacy of the technique.

Key words: *Mechanical insuflattion-exsufflation. Neuromuscular. Usage pattern.*

CO 046. PULMONARY REHABILITATION IN PRIMARY HEALTH CARE: AN EFFECTIVE INTERVENTION EVEN WITH MINIMAL RESOURCES

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Introduction: Pulmonary rehabilitation (PR) is a cornerstone intervention for the management of chronic respiratory diseases however it is underutilised and highly inaccessible to patients. In Portugal, most PR programmes are outpatient, hospital-based and directed to patients with advanced disease leading to less than 1% of patients having access to it. Recognising the urgent need to increase access to this fundamental intervention, the Portuguese National Health Service has determined that until the end of 2017, all Agrupamentos de Centros de Saúde should provide access to PR (Law n. 6300/2016). This study assessed the effects of PR conducted in primary health care centres (PHCC), with minimal resources.
Methods: A quasi-experimental pre-post study was conducted. Eligible patients with chronic respiratory diseases were identified by family doctors and refereed to PR. Sociodemographic, anthropometric and clinical data were collected with a questionnaire and lung function with spirometry. The following measures were collected: dyspnoea during activities with the modified medical research council-dyspnoea scale (mMRC); peripheral muscle strength in the upper limbs with the handgrip, in the lower limbs - quadriceps muscle strength (QMS), with the handheld dynamometry and respiratory muscle strength with maximal inspiratory and expiratory pressures (MIP/MEP); functionality with 1-minute sit-to-stand (1-min STS), exercise tolerance with the six-minute walk test (6MWT), functional balance with the Brief-BESTest and quality of life with the Saint George's Respiratory Questionnaire (SGRQ). All data were collected pre/post a 12-week PR programme implemented with minimal resources (pulse oximeters, blood pressure monitors, modified Borg scales, chairs, stairs, corridors, free weights built with bottles with sand, therabands and cushions), composed of exercise training twice a week and education and psychosocial support once every other week. Pre/post differences and effect sizes (ES) were calculated. For the measures with an established minimal clinical important difference (MCID), an analysis of the number of patients improving above that value was conducted.
Results: Eighteen patients participated (68.6 ± 1.9 years old; 11(61.1%) female; BMI = 29.5 ± 4.8kg/m^2; FEV1pp = 70.2 ± 4.9; FVCpp = 88.4 ± 24.3), 6(33.3%) with chronic obstructive pulmonary disease (FEV1pp = 61.7 ± 16; FVCpp = 89 ± 30; GOLD II-5, GOLD III-1, 1A, 4B, 1D), 8(44.4%) with asthma (FEV1pp = 79.1 ± 12; FVCpp = 92 ± 20.1), 3(16.7%) with Asthma-COPD Overlap Syndrome (FEV1pp = 67.7 ± 42.3; FVCpp = 88.7 ± 28.8) and 1(5.6%) with pulmonary fibrosis (FEV1pp = 58; FVCpp = 56). After PR, significant improvements were observed in all measures (Table). Concerning the MCID, 10(55.6%) improved above the established 1 point in the mMRC, 14(77.8%) patients above the 3 repetitions in the 1min-STS; 15(83.3%) patients above the 25m in the 6MWT, 7(38.9%) patients above the 4,9 points in the Brief BESTest and 11(61.1%) patients above the 4 points in SGRQ.

Results from pulmonary rehabilitation (n = 18)

Medidas	Pré	Pós	p	ES
mMRC M [IIQ]	2 [1-2]	1 [1-2]	0.003	0.81
Handgrip (kg)	25 ± 7.7	28.8 ± 7	0.002	0.53
FMQ (kgf)	25.9 ± 8	32.4 ± 6	0.0001	0.92
PIM (cmH_2O)	66.2 ± 26.8	75.3 ± 19	0.036	0.39
PEM (cmH_2O)	99.4 ± 38.7	107.7 ± 36	0.028	0.39
1-minSTS (repetições)	24 ± 9	32 ± 12	0.001	0.78
TM6M (m)	360.5 ± 80.6	435.4 ± 89.7	0.0001	0.88
Brief BESTest	16 ± 5.3	20 ± 3.5	0.0001	0.89
SGRQ	48 ± 14.6	38.8 ± 11	0.008	0.71

Values are presented as mean ± standard deviation or median [interquartile range]. mMRC: *Modified medical research council-dyspnoea*; QMS: Quadriceps muscle strength; MIP/MEP: Maximal inspiratory and expiratory pressures; 1-minSTS: 1-minute sit to stand; 6MWT: 6 minutes' walk test; SGRQ: *Brief BESTest* and *Saint George* Respiratory Questionnaire. Significant values p < 0.05. Effects sizes (ES) small (≥ 0.2), medium (≥ 0.5) and large (≥ 0.8).

Conclusions: Even with minimal resources, PR is feasible and possible to implement in PHCC, providing similar benefits to those well-established for PR programmes carried out in hospital outpatient settings.

Key words: *Pulmonary rehabilitation. Primary health care. Minimal resources.*